

ezine
ifssh

CONNECTING OUR GLOBAL HAND SURGERY FAMILY

PEARLS OF WISDOM
MANAGING FAILURE

HAND THERAPY
HAND-INJURY CARE FOR ALL:
STRATEGIC STEPS TOWARDS UNIVERSAL
HAND THERAPY COVERAGE



*We have
reached
50!*



Discovering
Homo sapiens' roots



Homo naledi

Homo naledi lived some 335000-23600 years ago in the Cradle of Humankind near Johannesburg, South Africa.

So far at least 18 individuals have been identified. Another recent find was that of a small child skull carefully placed on a shelf, which suggests some form of cultural or religious ritual. Also, much evidence of fire used for light and cooking has been observed.

H. naledi had *Australopithecus*-like traits (eg. pelvis, shoulders and long fingers) as well as *Homo sapiens* traits (hands, feet and brain anatomy)

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68 UPCOMING EVENTS

We have reached 50!

At the 11th IFSSH Congress in Seoul, Korea, November 2010 in the presidential acceptance speech, I announced the intention to establish an electronic communication medium for the members by the members of all our Member Societies. The planning of this venture started some 3 months earlier around a kitchen table in Pretoria, South Africa, with the help of editor versed in digital journalism, Marita Kritzing-MacDonald (fig 1)



The first edition of the IFSSH Ezine was published in February 2011, and every 3 months since then. It has grown steadily and become an integral part of the mechanics of the Federation. All the previous Ezines are fully accessible on the IFSSH website (www.ifssh.info).

My sincere appreciation goes to Michael Tonkin for his help from the beginning, and for Tammy Hansen, who midway, has taken over the graphic design and layout.

This official electronic magazine is sent free of charge world-wide to many thousands of surgeons, therapists and others who have an interest staying up to date with the activities of the International Federation, the Regional Federations and the Member Societies. It also serves to share current views and ideas in hand surgery and therapy.

The IFSSH is an umbrella organisation which aims to promote knowledge in the management of hand conditions by various financial sponsorships and the triennial international congresses. The Ezine serves to spread this information.

Every individual member of their National Hand Society is automatically a member of the IFSSH, and is encouraged to contribute to the Ezine ("....for the members, by the members..!").

Happy reading!

Ulrich



ULRICH MENNEN

Editor

President's Message

The publication of this 50th issue of the IFSSH Ezine marks a milestone in the history of the IFSSH and the Ezine. It was during his Presidential Acceptance Speech given during the 2010 Triennial IFSSH Congress in Seoul, Korea, that Professor Ulrich Mennen laid out his vision for the IFSSH electronic magazine, the Ezine.

Mennen stated that he hoped the Ezine would "draw the hand surgery family together by enhancing communication via the Internet" and that "it should become a tool to spread and share information, as one would expect communication to flow in a family, or a well-run company." To state that the goal set by Professor Mennen in 2010, has been met, and indeed exceeded, would be a gross understatement.

The Ezine, under the editorship of Ulrich Mennen, has served as the glue that has held the IFSSH together over these many years. Without the inter-federation communication provided by the Ezine, the IFSSH would most assuredly have given in to the entropy that is inherent in global organizations and may not have survived. When Professor Mennen launched the Ezine, the IFSSH counted 49 Member Societies. Now we are a family of 62 Societies that continues to grow.

The Ezine and the communication it has engendered has been essential to this growth of the IFSSH. I stated earlier that the Ezine is the glue that has held the IFSSH together, but it is also its nervous system. Communication "impulses" travel through the organization via the Ezine between members and between leadership and the members. It has served as a memory for the organization through its publication and archiving of Society histories, periodic Member Society updates and innumerable scientific articles.

The IFSSH owes a great debt of gratitude to Ulrich Mennen for his vision and for his unwavering dedication to the IFSSH and the Ezine!

Professor Mennen, thank you very much!

Gratefully!



DAN NAGLE

President: IFSSH

Message from the Secretary-General:



The contribution of the IFSSH to the world of hand surgery continues to grow.

Take a look at the website - www.ifssh.info - changes have been made recently and more are to come as it is made more concise and easier to navigate. Our social media profile on Instagram and Twitter is regularly updated - if any hand surgeon has material relevant to hand surgeons around the world please let Jin Bo Tang (jinbotang@yahoo.com), Aida Garcia (aidahope@hotmail.com) and Belinda Smith (administration@ifssh.info) know.

In the last newsletter I explained how the inaugural IFSSH Mid-Term Course in Hand Surgery in Ecuador is progressing. The programme is now near completion. There is a broad range of topics and eminent speakers. The venue has changed from Guayaquil to Quito to allow for easier travel arrangements for all, but the dates remain unchanged - 31 January to 3 February 2024. Please consider attending! <http://www.ifssh.info/mid-term-course.php>

The Ezine is a pillar of the IFSSH - it allows surgeons from around the world to share their ideas, plans and experiences. If anyone has material that they would like to be considered, please email it to our Editor Professor Ulrich Mennen (ezine@ifssh.info).

Our Global Partnership initiative is developing - we now have space on the website to populate with information about outreach programmes, equipment and educational material for Low-Middle Income countries and so on. If you or your society have any contacts or material then please email me, your society delegate or your regional Member-at-Large

Finally, like any organisation we need a solid financial basis. For the IFSSH, the more money we have the more we can support hand surgery education and projects around the world. A new IFSSH sub-committee of three of our Members-at-Large (Greg Bain, Paco del Pinal and Jorge Clifton) is considering ideas to increase our revenue.

IFSSH Harold Kleinert Visiting Professors

To honour his extraordinary contribution to global teaching, the IFSSH Harold Kleinert Visiting Professorship enables a hand surgery society to benefit from the expertise and experience of a distinguished hand surgeon.

Dr Steven Moran was the first IFSSH Harold Kleinert Visiting Professor, undertaking a journey from the Mayo Clinic, USA, to Australia in March 2020. Dr Moran commenced his Professorship in Sydney, lecturing to the

New South Wales Hand Surgery Association (NSWHSA) and the local orthopaedic and plastic registrars, and contributing his knowledge at the NSWHA clinical meeting. The tour then continued to Melbourne for numerous teaching activities at the Australian Hand Surgery Society's Hand Surgery Registrar Conference and then keynote lectures at the 2020 Asia-Pacific Federation of Societies for Surgery of the Hand (APFSSH) Congress. Dr Moran's trip was cut short by one day, with the Covid-19 pandemic declared in Australia on the penultimate day of the APFSSH Congress. This resulted in the early closure of the Congress and expedited trips to the airport! Dr Moran's report can be read here: <https://www.ifssh.info/ifssh-sponsored-educational-projects.php>

The Polish Society for Surgery of the Hand has successfully applied for an IFSSH Harold Kleinert Visiting Professor to join their society's activities in 2023. Prof Jin Bo Tang will join our Polish colleagues from 20th September to 5th October. He will contribute to an extensive programme of courses and lectures across numerous centres throughout Poland, joining all levels of hand surgeons from trainees to consultants, and including the Polish national meeting within his travels.

Interested societies should consider the guidelines and criteria - https://www.ifssh.info/pdf/IFSSH_Harold_Kleinert_Visiting_Professor.pdf - and contact the IFSSH Committee for Educational Sponsorship (administration@ifssh.info) with questions or submissions.

IFSSH Social Media Correspondents

In late 2022 the IFSSH Communications Director, Jin Bo Tang, established the "IFSSH Social Media Correspondents" team. This group of 12 correspondents come from different areas of the globe and are well-known users of social media. Many have experience in facets of the IFSSH and all bring their enthusiasm and energy to the positions.

The Social Media Correspondents are:

- Aida Garcia Gomez - Colombia; IFSSH ExCo Member-at-Large, IFSSH Colombia Delegate
- Ilse Degreef - Belgium; IFSSH Nominating Committee, past IFSSH Belgium Delegate
- Fidel Cayón - Ecuador; 2024 Mid-Term Course host, IFSSH Ecuador Delegate
- Nathaniel Orillaza - Philippines; IFSSH Philippines Delegate
- Leonardo Lazaro - Argentina
- Jing Chen - Association of Chinese-Speaking Hand Surgeons United
- Ricardo Kaempf - Brazil
- Lucian Lior Marcovici - Italy
- Sze Ryn Chung - Singapore
- Piyabuth Kittithamvongs - Thailand



These correspondents will forward news and material over a 2 year term.

The social media posts of the IFSSH - @IFSSHHand - are now easily recognisable with our new format on Twitter and Instagram.

Future Meetings

A detailed list of national and regional hand surgery meetings is available on the IFSSH website. The triennial IFSSH Congresses are as follows:

1st IFSSH Mid-Term Course in Hand Surgery
Quito, Ecuador
31st January - 3rd February, 2024



XVIth IFSSH – XIIIth IFSHT Congress Washington D.C., USA
23rd - 28th March, 2025



XVIIth IFSSH – XIVth IFSHT Congress Singapore
23rd – 27th October, 2028 (TBC)



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Twitter/Instagram: @IFSSHHand

With very best wishes,



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IFSSH DISCLAIMER:

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Should you be interested to advertise in this publication, please contact the Editor: ezine@ifssh.info

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Message from James R Urbaniaak

IFSSH PAST PRESIDENT AND PIONEER OF HAND SURGERY

HAIL TO THE IFSSH

It is appropriate that I congratulate IFSSH Ezine and its enthusiastic and creative editor, Ulrich Mennen, on the publication of this 50th issue as I was honored to serve as a member of the Executive Committee of the IFSSH during the initial Ezine publication in 2011. As longtime friends and colleagues, Ulrich and I have learned together from our involvement with the IFSSH. I might add that Ulrich completed a Hand and Microsurgical Fellowship at Duke University forty years ago.

The Ezine since its inception has upheld the primary purpose of the Federation, which is coordinating activities of the various Hand Societies throughout the world, and thus increases and spreads the knowledge of surgery of the hand. The IFSSH Ezine with the contributions from hand surgeons and hand therapists from around the world has definitely played a major role in uniting the global hand surgery community.

Having been involved in the IFSSH for more than four decades, it has been indeed rewarding to witness the leaders of the IFSSH maintain its core values and ideals of its mission, but also to adapt with the rapidly changing times of the dynamic specialty of hand surgery. Over the decades, the Executive Council and Delegates Council have continued to make modifications to improve the unity and feeling of belonging by the Member Societies.

For example, for more than 30 years the Council met in the United States at the time of the Annual Meeting of the American Society for Surgery of the Hand. In 1999 we moved the Council Meeting to the site of the FESSH Annual Meeting to accommodate a large number of European members and to have more countries attend and participate.

The productivity of the committees has greatly varied over the years. In the early years they produced monographs and extensive and comprehensive reports, such as standards of nomenclature for classification of hand injuries and diseases. These committee reports initially varied from six to thirty but have subsequently waned. This decreased productivity by the committee prompted me to edit the book "Hand Surgery World Wide" to stimulate written activity by each of the Member Societies. It is amazing that fifty out of fifty IFSSH member countries responded with a comprehensive chapter. This unified participation is a testimony of what Ulrich Mennen described as the "dedicated family" of the IFSSH.

The strength of the Federation has been the Triennial Congresses, all of which have been successful by all accounts. Thanks to the committed Congress Hosts and the Executive Council, the attendance, quality and scope of the scientific presentations, and the exchange of knowledge and skills by the leaders and pioneers of hand surgery.

Most rewarding to the attendees is that these Meetings provide and encourage the development and maintenance of new and long-term international friendships. In addition, many of the Triennial Congresses have been financially profitable. The financial stability of the Federation has enabled the lowering of member dues for "lower income" countries and to sponsor educational workshops and fellowships.

Under the leadership of our superb recent Presidents (Ulrich Mennen, Michael Tonkin, Zolt Szabo, Marc Garcia Elias and Dan Nagle) and the Executive Council, the worthwhile activities of the IFSSH have flourished during the past decade while the number of member societies has increased from 49 to 62. The bylaws have been amended and restated several times since 1966 with significant changes being made during the last eight years. These changes were designed to address the preservation of institutional memory and the excessive time spent on the Executive Committee (Exco), to improve opportunities for Societies to participate in the governance of the IFSSH, to improve the transparency of the Exco nomination process and improve global representation on the Exco.

There was some interest in moving to a Biennial Congress rather than a Triennial Congress, but this was rejected. Therefore, a Midterm Course midway between the Triennial Congresses was conceived to foster the desire to increase the frequency with which Member Societies can congregate.

The website of the IFSSH which was firmly established under Raja Sabapathy in 2007, is now under the creative directorship of Jin Bo Tang. Jin Bo is also active in social media platforms and is co-editing an IFSSH book. The Federation has ambitious plans to increase new sources of revenue to achieve its multiple educational endeavors.

Further valuable communications and spread of knowledge on a global manner have been initiated, which include selected key publications

of the major hand journals for re-publishing (with acknowledgement) in the IFSSH Ezine for a wider readership.

The field of hand surgery continues to have energetic and swift changes. The IFSSH has committed to being a global leader in the spread of these progressives. We are grateful for the dedicated long-term service of Belinda Smith, our permanent Administrator who has certainly made our leaders' roles easier. I thank Dan Nagle, our current President for updating me on the recent Federation activities. The Federation, without a doubt, has become the heart of global hand surgery education and unity, and has exceeded its initial expectations. With the dedicated and excellent leadership of the Executive Council and the enthusiasm of the Delegates Council, the future of the IFSSH is bright!



JIM URBANIAK

IFSSH Mid Term Hand Surgery Course

IFSSH MID TERM COURSE

ECUMANO and Ecuador, are very proud to have been designated as the host for the first IFSSH Mid Term Course.

It will take place from 31 January to 3 February 2024 in Quito city. The Quito Metropolitan Convention Centre has been selected as the venue for this great scientific event.

The course will be developed in a hybrid, face-to-face and virtual modality.

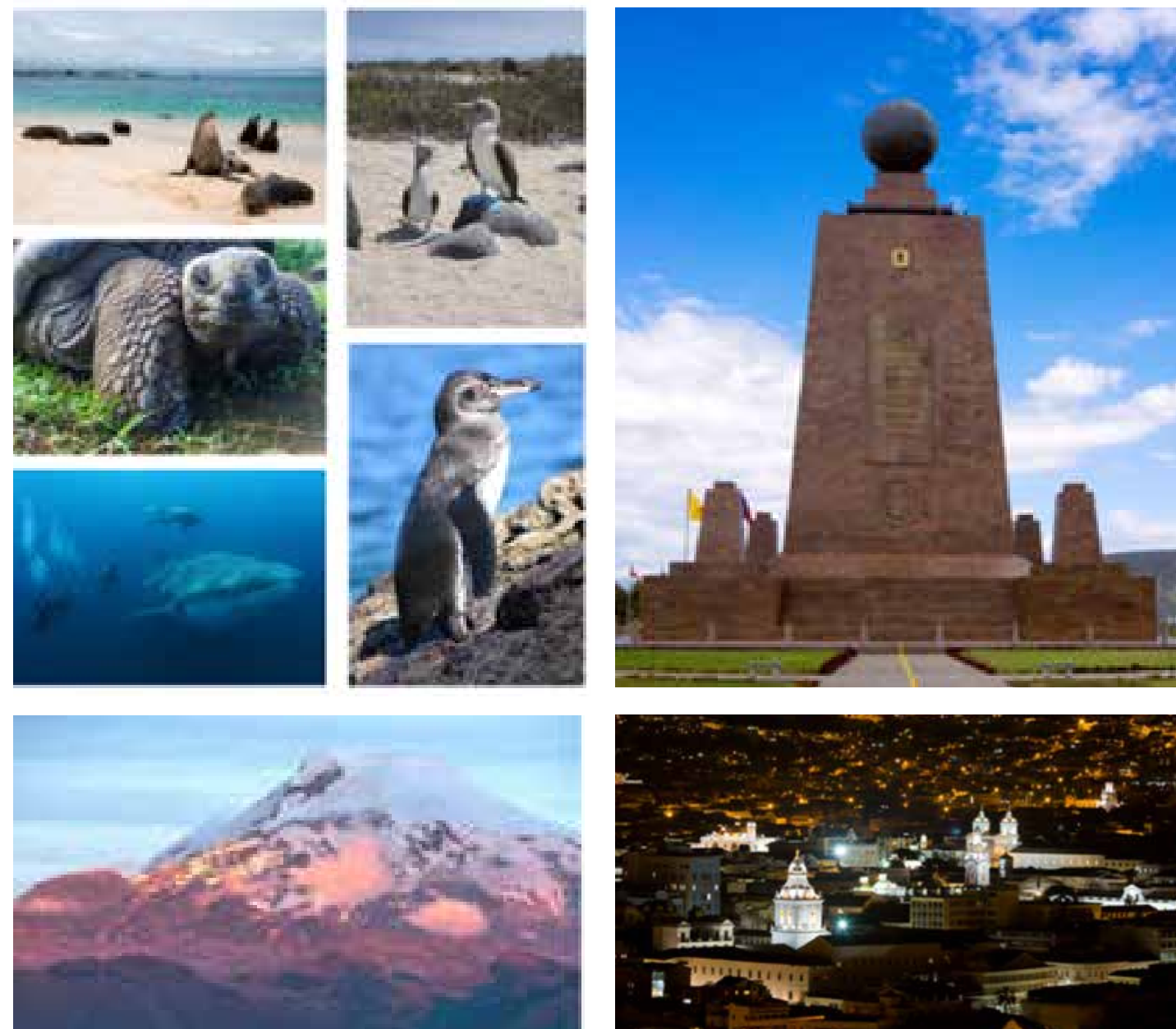


The venue is located in a strategic part of the city, near the Bicentennial Park (where the former Quito Airport was located). It has international environmental LEED certification and can be reached quite easily.



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The Mid Term Course will be led by five international known speakers:



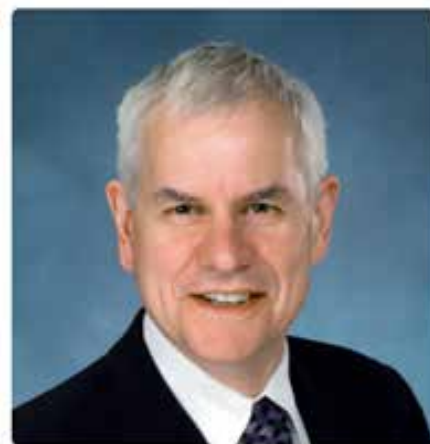
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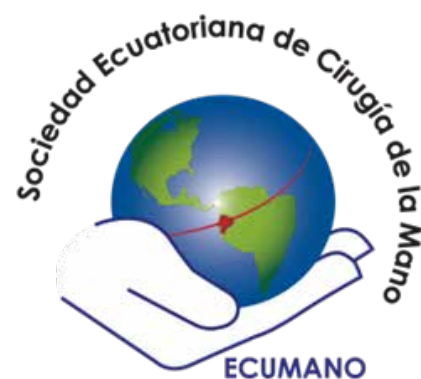
 Donald Lalonde



 Marc Garcia-Elias

We are waiting for you, come to Ecuador and be part of this and together we will...

UNITE THE HAND SURGERY WORLD FROM THE VERY CENTRE OF THE PLANET.



IFSSH
Mid Term Course
Second Ecuadorian
Hand Surgery Congress



QUITO – ECUADOR

Jan 31-Feb 3
2024
METROPOLITAN
CONVENTION CENTER

Event organized by:



**INTERNATIONAL
FEDERATION OF SOCIETIES
FOR SURGERY OF THE HAND**



ECUMANO
SOCIEDAD ECUATORIANA
DE CIRUGÍA DE LA MANO

Yasuo Ueba (1935)

Yasuo Ueba was born on 16 October 1935. He qualified as medical doctor from the Kyoto University Medical School in 1960. He then rotated as an Intern at the Yokosuka U.S. Naval Hospital from 1960-1961. In 1961 he was an Orthopaedic Resident at the Kyoto University Hospital and the following year an Orthopaedic Fellow and Surgical Resident at the Boston City Hospital, Boston, USA until 1963. From 1963 to 1964 Ueba was a Paediatric Orthopaedic Resident at the J.L. Kernan Hospital in Baltimore, USA.



He had another stint as Orthopaedic Resident from 1964-1965 at the Brooklyn Chronic Disease Hospital in New York, USA. As a Hand Fellow he got his hand surgery training from Robert E. Carroll at the Columbia-Presbyterian Hospital and Harlem Medical Centre in New York, USA in 1966. He then moved back to Japan and joined the Department of Orthopaedic Surgery, Faculty of Medicine of the Kyoto University as an Assistant Professor, and, in 1979, he became Associate Professor until 1987. In the meantime he gained his PhD degree. Prof. Ueba was also Professor at the College of Medical Technology of the Kyoto University from 1967-1992, and the Dean of the College from 1992-1995. In 1995 Ueba became Superintendent of the Shiragikuen Hospital in Kochi, Japan, until 2003. He is now Professor Emeritus at the Kyoto University.

In 1978 Ueba performed the first free vascular fibula graft in Japan. He was one of the pioneering micro-surgeons in his country and devised an atraumatic micro-vascular surgical clip system, and is also known for his work on the survival of free tendon grafts.

Yasuo Ueba was a prolific writer of medical articles and chapters in textbooks. In 2018 he published the textbook: "The Hand: its function and anatomy"

Professor Ueba served on many councils and boards including the Medical Advisory Board of NPO i-HOPE Institute for Health Outcome and Process Evaluation Research for many years. He played leadership roles in many medical organisations. He is Honorary Member of the Japanese Society for Surgery of the Hand, Japanese Elbow Society and the Japanese Shoulder Society.

Amongst many other awards, Ueba received the "Special Contribution Award" from the Japanese Orthopaedic Association in 2006.

For his huge contribution to Hand Surgery in Japan, Yasuo Ueba was honoured as "Pioneer of Hand Surgery" at the Tenth Congress of the International Federation of Societies for Surgery of the Hand in Sydney, Australia on 11 March 2007.

James R. Urbaniak (1936)

James Randolph Urbaniak was born in Fairmont, West Virginia, United States of America, on 15 May 1936. He graduated from the University of Kentucky in 1958 (B.S degree, Magna Cum Laude and Phi Beta Kappa), and in 1962 from the Duke University Medical School (Alpha Omega Alpha Medical Honorary) where he also completed his internship one year later. In 1963 Urbaniak was drafted into the USA Navy as Attending Physician to the US Congress and Supreme Court before returning to Duke University Medical Centre (DUMC) in Durham, to complete his Orthopaedic Residency in June 1969. In July 1991 he became Virginia Flowers Baker Professor of Orthopaedic Surgery and from 1985 to 2002 the Chief of the Division of Orthopaedic Surgery. From 1975 to 2005 Urbaniak was also Director of the Hand Surgery Unit and Vice Chairman of the Department of Surgery at DUMC.



Prof. Urbaniak was Chairman of the Board of Trustees of the Orthopaedic Research and Education Foundation (OREF, 2001) and the Board of Trustees of the Journal of Bone and Joint Surgery (2004-2005), President of the American Orthopaedic Association, the American Board of Orthopaedic Surgeons, and the IFSSH, amongst others.

His pioneering work in microsurgery at DUMC earned him international recognition notably in replant surgery and free tissue transfers e.g. free vascularized fibula grafts for avascular necrosis of the femoral head. Numerous residents (328), hand fellows (124) and international research fellows (81 from more than 20 countries) were not only taught by Urbaniak, but were influenced by his endearing example as a clinician. His dictum still resonates clearly: "It is not how much you know; it is about how much you care".

Urbaniak published over 300 peer reviewed articles and 13 books, has lectured in numerous countries and became honorary member of several.

James Urbaniak has received many awards and honours from amongst others the American Orthopaedic Association, American College of Surgeons, Duke Medical Faculty, Duke Orthopaedic Residents and Fellows, Duke Medical Alumni Association, University of Kentucky, State of North Carolina, and an Honorary Doctorate (University of Athens, Greece).

Jim, as he is fondly called, is married to his wife Muff (Martha Shawger) a former nurse, also from 'Duke'. He loves collegiate sports especially football. While a student at University of Kentucky he excelled in football. His involvement in sports medicine at DUMC resulted in the Sport Sciences Institute being named after him in 2016.

At the Tenth Congress of the International Federation of Societies for Surgery of the Hand in Sydney, Australia on 11 March 2007 James Randolph Urbaniak was honoured as a "Pioneer of Hand Surgery".

Re-published Articles

RE-PUBLISHED ARTICLES: SURGERY IN SCLERODERMA

Review Article



HAND
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Considerations for Hand Surgery in Patients With Scleroderma

Chelsea R. Brown¹, Nisha J. Crouser¹, and Amy L. Speeckaert¹

Abstract

Systemic sclerosis (scleroderma, SSc) is an autoimmune disease that causes significant dysfunction to multiple organ systems, including the musculoskeletal system. It poses significant challenges to the hand surgeon, including calcinosis, ischemic changes, Raynaud phenomenon, tendinopathies, synovitis, and joint contractures. Patients with SSc also suffer from multiorgan dysfunction, which makes them high-risk surgical patients. The hand surgeon must understand the pathophysiology, treatment strategies, and special operative considerations required in this population to avoid complications and help maintain or improve hand function.

Keywords: systemic sclerosis, scleroderma, hand surgery, Raynaud phenomenon, calcinosis, joint contracture

Introduction

Systemic sclerosis (scleroderma, SSc) is an autoimmune disease of unknown etiology that can cause significant dysfunction to multiple organ systems. Systemic sclerosis is a resultant of 3 pathogenic processes: obliterative vasculopathy, immune dysregulation with production of autoantibodies, and increased extracellular matrix and collagen production from fibroblast dysfunction. Ultimately these lead to progressive vascular insufficiency and fibrosis of the integumentary, musculoskeletal, cardiovascular, pulmonary, renal, and gastrointestinal systems.^{1,2}

Systemic sclerosis is classified as either limited cutaneous scleroderma or diffuse cutaneous scleroderma (dcSSc) depending on extent of disease process. Limited cutaneous scleroderma has a prolonged disease course with skin manifestations typically limited distal to the elbows and knees, whereas dcSSc has a rapidly progressive course, extending proximal to the elbows and knees with marked trunk and multisystem organ involvement.^{1,3} Both subsets of SSc have significant hand manifestations including calcinosis, ischemic changes, Raynaud phenomenon (RP), tendinopathies, synovitis, and joint contractures. These manifestations place patients at risk for superficial and deep infections and wound healing complications. An understanding of the pathophysiology, and special operative considerations required in this population will allow hand surgeons to avoid complications and optimize treatment outcomes.

Calcinosis

Calcinosis cutis is defined as the deposition of insoluble calcium in the skin and subcutaneous tissues in the setting of normal calcium metabolism.⁴ The prevalence of this condition in patients with SSc is approximately 22%, typically occurring about 10 years after diagnosis.⁵ The pathophysiology of calcinosis cutis is largely unknown; potential mechanisms include local trauma, inflammation, vascular hypoxia, and dysregulation of bone matrix proteins leading to the accumulation of calcium deposits. The theory of microtrauma supports the fact that patients most commonly present with lesions in the subcutaneous tissues and fascia of the hands (more commonly the dominant hand) and feet. Also affected are the extensor surfaces of forearms, elbows, and knees.⁵ Radiographs reveal 1 of the 2 characteristic patterns in the hand: widespread calcium deposits along the length of the finger or well-defined deposits at the distal tuft (Figure 1).⁶ While often asymptomatic, severe calcinosis in the hands can lead to pain, soft tissue and joint contractures, and skin ulcerations. In the setting of superimposed ischemia,

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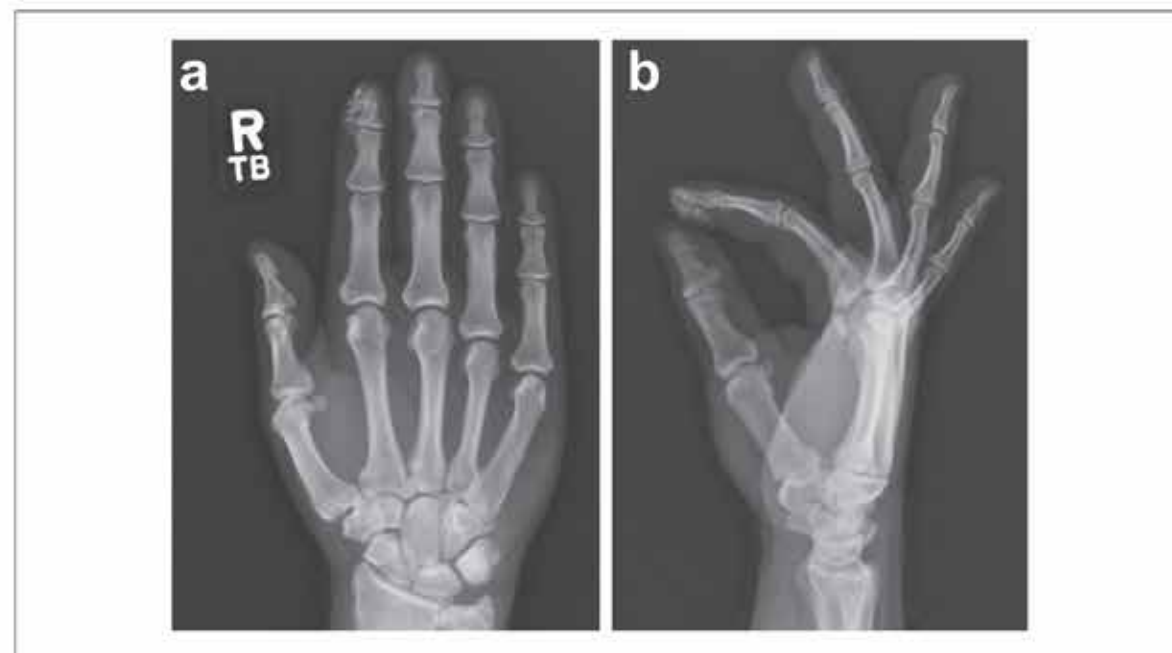


Figure 1. (a) Anteroposterior and (b) lateral radiographs of the hand depicting calcinosis of the index finger tuft.

skin ulcerations place the patient at risk of soft tissue or deep infection as well. Given the unknown pathogenesis, treatment for calcinosis remains challenging. Although many medical therapies have been suggested (including calcium channel blockers, warfarin, bisphosphonates, rituximab, and sodium thiosulfate), there is limited evidence to support their use, given variable results and small trials.⁷ For painful lesions, acetaminophen and nonsteroidal anti-inflammatory drugs can be used for symptomatic relief. Ultimately, surgical excision is the treatment of choice for symptomatic calcinosis, particularly in the setting of superimposed infection. The most common surgical technique involves simple excision with a scalpel and thorough curettage to ensure that all residual calcification is removed. For diffuse disease, the goal is debulking rather than complete excision. Incisions can be left open or closed depending on the size of the wound, although it is important to note that this patient population may be at a higher risk for wound complications secondary to vascular compromise.⁷ Aside from surgical excision, other minimally invasive techniques have been described. Calcinosis has been treated using a high-speed burr procedure in which small stab incisions are made through which calcium deposits are burred and extruded with saline.⁸ Lapner and Goetz⁸ suggest that the high-speed burr technique should be reserved for focal calcinosis limited to 1 or 2 fingers. Finally, carbon dioxide laser therapy has been used to vaporize calcium deposits with moderate resolution of pain, although results show limited success.⁹ It

is important to note that asymptomatic lesions should not be treated surgically, given the high rate of recurrence and potential for wound complications.

Ischemia

Ischemia associated with SSc is one of the most debilitating consequences of the disease, given the chronic pain and disability that ensues. It is now recognized that microvascular and macrovascular changes are a common finding in patients with scleroderma with a predominance of ulnar artery and superficial palmar arch involvement in the hand (Figure 2).¹⁰ The narrowing of these major hand vessels in addition to microthrombi formation, tissue damage, and vasospasm leads to digital ulceration. Three types of digital ulcers have been identified by Hachulla et al¹¹: fingertip (ischemic), extensor surface (mechanical), and calcinosis-associated ulcers (related to mechanical and inflammatory phenomena). Digital ulcers can result in significant morbidity, often becoming digit-threatening secondary to osteomyelitis or gangrene (Figure 3).⁷ More than half of the patients with SSc will experience digital ulceration during the disease course, with one-third going on to recurrent ulceration despite pharmacologic treatment.¹²

The presence of underlying infection in the setting of digital ulcers is common, with Giuggioli et al identifying 67% of ulcers having a local infection (Figure 4). The most common organisms identified were *Staphylococcus aureus*

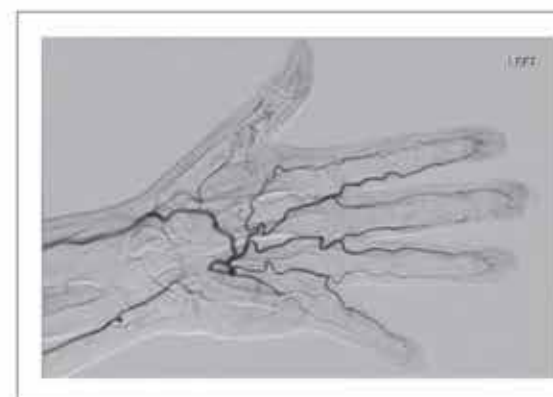


Figure 2. Arteriogram of a patient with systemic sclerosis and an ulnar artery thrombosis.

followed by *Escherichia coli*, *Enterococcus faecalis* and *Pseudomonas aeruginosa*.¹³ Osteomyelitis was identified in approximately 20% of patients in the study, with 11% of patients requiring digital amputations. Typical wound care for ulcers without overlying infection includes topical hydrogel with or without antimicrobial agents. Once an infection has developed, thorough irrigation and debridement of the wound is necessary to disrupt biofilm formation and remove nonviable tissue. If underlying osteomyelitis is present, the patient will likely need a long-term course of systemic antibiotics. Once dry gangrene has developed, the nonviable area is left to demarcate and

eventually autoamputate. Autoamputation can take months to progress but is advantageous because length of the digit is preserved. Although surgical amputation is immediate, the creation of a new surgical wound in an area of compromised blood supply often results in wound complications. Therefore, formal amputation is reserved for severe cases or those with underlying infection.⁷

Raynaud Phenomenon

Raynaud phenomenon is seen in up to 96% of patients with SSc and is often the first manifestation of the disease.⁷ It is characterized by vasospasm of the cutaneous arterioles of the hands in response to cold or increased sympathetic tone.¹⁴ Patients typically experience episodic pallor or cyanosis of the digits induced by cold or stress. Raynaud phenomenon alone is typically benign, but when combined with the underlying vasculopathy of systemic scleroderma it can cause more severe changes. This is attributed to progressive endothelial damage, intimal hyperplasia, adventitial fibrosis, and luminal narrowing resulting in ulceration and chronic pain.⁷

With regard to management of RP, patients are generally managed by a rheumatologist. It is advised that patients protect their hands from inciting events by keeping their hands warm in cold conditions and avoiding smoking.⁷ Pharmacologic vasodilators are often prescribed as well to control the incidence of attacks.¹⁵ Calcium channel blockers, most commonly nifedipine, are first-line therapy.¹⁵ They have been shown to reduce both the frequency and

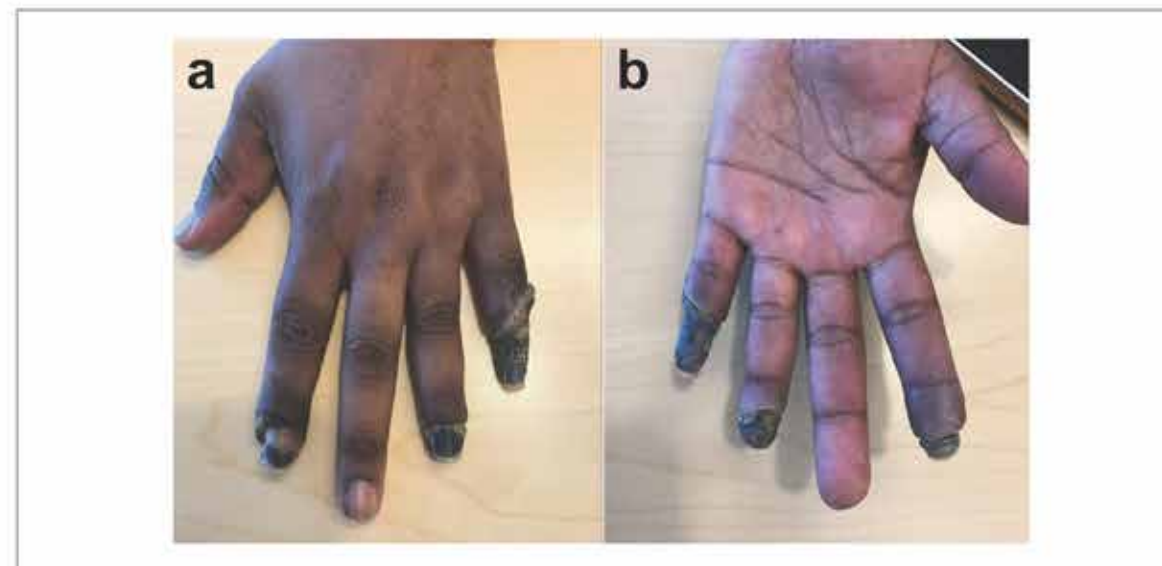


Figure 3. Dry gangrene as a result of ischemic changes in multiple fingertips in a patient with systemic sclerosis. (a) Posterior view. (b) Anteroposterior view.



Figure 4. Osteomyelitis of the index finger and second ray with overlying soft tissue infection in a patient with systemic sclerosis.

severity of Raynaud attacks while also lowering the incidence of ulcerations.¹⁶ Second-line treatment options include angiotensin II receptor blockers and phosphodiesterase 5 inhibitors (sildenafil and tadalafil); unfortunately, these are typically more expensive and have a higher side effect profile such as headaches, flushing, cough, dizziness, hypotension, and arrhythmias.¹⁵ For severe symptoms and critical ischemia, prostaglandin analogs have become the standard of care but can be administered intravenously for 3 to 5 days, and are very expensive.¹⁵

Given the propensity for these patients to go onto digital ulceration and gangrene, procedures have been developed in attempt to increase blood flow to the hand. The most common surgical intervention is periarterial sympathectomy (Figure 5). This involves microscopically stripping the arterial adventitia ultimately removing the sympathetic innervation from the distal hand vasculature.⁷ The primary targets for sympathectomy include the radial and ulnar arteries, superficial palmar arch, and common digital arteries. The extent to which the dissection is carried out is variable, ranging from millimeters of the involved digit to an extensive approach extending into the forearm.⁷ In general, it is recommended that 2 cm of adventitia be stripped from each vessel to ensure removal of sympathetic input.⁷ Pace and Merritt¹⁷ demonstrated favorable results with the extended periarterial sympathectomy in patients that had failed medical management, ultimately demonstrating improvements in ischemic pain, high rates of ulcer healing, and long-term patient satisfaction.

Chemical sympathectomy has also been described using botulinum A toxin for patients with RP.^{15,18} While there are several proposed mechanisms for the effect of botulinum A



Figure 5. Patient with Raynaud phenomenon in the bilateral hands status after sympathectomies of the radial and ulnar arteries and palmar arch on the left upper extremity.

administered locally including inhibition of sympathetic vasoconstriction, inhibition of sensory nerves, and endothelial exocytosis of endothelin, the exact mechanism(s) remains unknown.¹⁹ There has not been a consensus on dosing or injection protocols for botulinum A toxin, but most surgeons inject the toxin locally around the radial and ulnar arteries, the superficial palmar arch, and/or the digital vessels. While prospective studies have shown good results in patients with primary RP, the recent randomized controlled trial by Bello et al¹⁸ demonstrated mixed results in patients with SSc-associated RP. In this study, they found a decrease in measured laser Doppler blood flow to the hands receiving botulinum A injection at 1 month compared with placebo; however, no difference in blood flow was seen at 4 months. The decrease in blood flow was more significant in patients with dcSSc and long-standing RP. Despite this finding, there was a trend toward improvement in pain scores in hands receiving botulinum A injections, although this was not clinically significant.¹⁸ Based on the current literature, it is unclear whether the use of botulinum A toxin can provide benefit in patients with SSc-associated RP.

Tendon Involvement

Tenosynovitis is seen in up to 27% of patients with scleroderma. Although some patients experience inflammatory tenosynovitis similar to rheumatoid arthritis, patients with SSc are more likely to have fibrotic tendon sheath thickening, termed "sclerosing tenosynovitis." Extensor

tendons are more likely to be affected than flexor tendons, and synovitis is present in approximately 46% of patients. There is also a correlation between the presence of tenosynovitis and active or severe disease.²⁰

Patients with dcSSc can present with characteristic tendon friction rubs (TFRs) described as leathery crepitus over tendons.²¹ These TFRs can be present in ankles, knees, elbows, and wrist and are described in 6% to 37% of patients with SSc.^{20,22} Specifically for the hand surgeon, these can be palpable over the flexor or extensor tendons at the wrist or fingers.²³ These TFRs were originally assumed to be from fibrinous deposits in tendon and tendon sheaths,²³ but newer imaging studies suggest the infiltrates are in the deep soft tissues and the fat septae, leading to thickening of the pulleys of the fingers and extensor/flexor retinacula.²⁴ Although these TFRs do not require surgical intervention, they are correlated with increased functional disability, fingertip ulcers/gangrene/amputations, and joint contractures.^{22,25} In addition, TFRs are associated with worsening disease severity; increased renal, cardiac, pulmonary, and gastrointestinal involvement; and decreased survival rates.^{22,25} Due to the association between TFRs and increased mortality, it is extremely important for the hand surgeon to ensure that patients presenting with TFRs are referred to a rheumatologist, for disease treatment and monitoring.

Synovitis and Arthritis

Joint pain is exceedingly common in patients with SSc, with some studies reporting arthralgias in up to 66% to 97% of patients. Arthralgias present a notable challenge to this population, with most patients reporting significant pain and disability.²⁶ Arthralgias can be the presenting symptom of SSc, with up to 20% complaining of joint pain before SSc diagnosis.²⁶ Synovitis and arthritis on clinical examination can present in up to 46% of patients;^{20,27} however, subclinical synovitis can be detected in a much higher proportion on imaging studies.^{20,28} Radiographic studies demonstrate a wide range of joint pathology from inflammatory arthritis, including osteolysis and erosive changes, to osteoarthritis with subchondral sclerosis and osteophytes.^{26,27,29} The most common presentation, however, is joint space narrowing with or without bony changes.²⁹

Joint Contractures

Claw hand deformity with proximal interphalangeal (PIP) joint flexion contractures is present in up to 31% of patients with SSc and is often progressive.^{21,27} Contractures are more common in dcSSc but can occur in both subtypes.^{21,27,29} These contractures are a result of sclerosis of the skin, volar plate, and flexor tendon sheath with concomitant flexor

tendon shortening. With time, central slip attenuation and lateral band volar subluxation ensues.^{7,23,30} Progressive PIP flexion contracture causes tension, ischemia, and atrophy of the dorsal skin leading to ulcerations and infections.^{7,30} Compensatory extension occurs at the metacarpophalangeal (MCP) joints, which can be worsened by sclerosis and contracture of the dorsal soft tissues.^{6,7,30}

Procedures aimed to improve range of motion of the PIP joint, such as silicone arthroplasty and soft tissue releases, have been described. Outcomes of these procedures have been poor with significant residual stiffness. Therefore, most surgeons advocate for PIP arthrodesis.⁷ Lipscomb et al³¹ first described outcomes for hand surgery in 6 patients with SSc in 1969; he performed 17 PIP joint arthrodeses with complete fusion and healing in all patients. Many other surgeons have since reported their results with 94% to 100% fusion rates, minimal complications in wound healing, and improved hand function.^{6,30-34}

Position of PIP joint arthrodesis has been described ranging from 30° to 60° of flexion, with increasing angle from the index finger to the small finger.^{6,30-33} Placing the joint in too much extension can place tension on the volar blood supply and lead to finger ischemia⁶; therefore, it is imperative to assess distal finger blood flow intraoperatively and reposition the PIP joint accordingly. Lipscomb et al³¹ advocated for more flexion for PIP fusion to ensure proper contact with the thumb for pinch grip. Given limited MCP motion and concomitant thumb deformities, the surgeon should use careful intraoperative assessment to place the joint in optimal functional position.

Melone et al described the vascular supply to the skin overlying the PIP joint and advocate for dorsal bipedicle flaps in the setting of PIP joint fusions in patients with SSc (Figure 6).^{6,32} These allow for excision of dorsal wounds and have shown excellent results for soft tissue healing. Tension band wires and dorsal plates have been described for PIP joint fusions in the general population. Tenuous dorsal soft tissues and progressive contractures in patients with SSc, however, increase the risk of hardware exposure and need for further surgery.^{6,7,33} It is therefore recommended that fusions be performed with Kirschner wires that can be easily removed in clinic postoperatively.^{6,7,33,34}

To address hyperextension deformities at the MCP joint, both resection and silicone arthroplasties have been described.^{6,30-33} The risk of destabilizing the MCP joint is low due to the sclerosis and contracture of the surrounding soft tissues.³⁴ Therefore, complete metacarpal head and condyle resection is to remove tension on the soft tissues and regain motion.⁶ These procedures provided only slight improvements in joint range of motion with an average of 50° arc postoperatively, but produce better position for overall hand function.^{6,30-33} Metacarpophalangeal joint arthroplasty can be performed through a single transverse



Figure 6. Dorsal bipedicle flap advocated by Melone et al for proximal interphalangeal (PIP) joint fusions. Note. The soft tissues overlying the PIP joint derive their vascular supply from a (a) dorsal cutaneous network arising from the proper digital arteries. This flap allows for (b) elliptical excision of central devitalized tissue, (c) wide joint exposure, and (d) primary closure after fusion. This flap preserves the cutaneous vascularity to encourage wound healing. Reprinted with permission from Melone and Dayan.³²

dorsal incision allowing for complete joint exposure, preservation of periarticular vascular networks, and extensor mechanism centralization and repair.³² It is important to note that extensive hand therapy may be required to maintain the range of motion of the MCP joints postoperatively and residual stiffness is common.^{6,30-33}

Patients with SSc can develop adduction contractures of the thumb, along with trapeziometacarpal arthritis with compensatory hyperextension at the MCP joint.^{6,7,30} Surgical correction using trapeziectomy, adductor release, and/or MCP arthrodesis can be employed based on presentation.

Wrist Arthritis

Synovitis and arthritic changes of the wrist have also been reported in patients with SSc. Erosions and joint space narrowing are seen on radiographs, and synovitis is seen on advance imaging (ultrasound and magnetic resonance imaging).^{20,27,28} Limited studies exist comparing surgical interventions for synovitis and arthritis of the wrist in patients with SSc. Darrach distal ulna resection, wrist fusion, Sauve Kapandji procedure, and wrist total arthroplasty have all been described in this patient population.^{30,35} Further research is necessary to define the indications for operative intervention and to determine which operative procedure is most beneficial for patients with SSc.

Peripheral Neuropathies

Clinical symptoms of peripheral neuropathy, such as sensory disturbances, can be present in up to 40% of patients with SSc.³⁶ Carpal tunnel syndrome is the most common peripheral compressive neuropathy,³⁶⁻³⁸ but SSc can also present with cubital tunnel syndrome or mixed peripheral neuropathies.^{36,37} The etiology of these neuropathies has yet to be determined, but it is proposed that patients with SSc have fascicular loss and increased fibrotic deposits.³⁹ It is theorized that these changes could be from microangiopathy and nerve ischemia.^{36,39} These can be the earliest presenting symptoms of SSc, and a patient with compressive neuropathy combined with finger pain, swelling, and/or RP should be worked up for SSc.

Operative Considerations

Patients with SSc suffer from multiorgan dysfunction which makes them high-risk surgical patients, and a detailed preoperative medical evaluation is imperative. Due to facial skin and muscle tightness and stiffness, intubation can be difficult.⁴⁰ Proper ventilation can be inhibited by interstitial lung disease and pulmonary fibrosis, carrying a high risk of barotrauma.⁴⁰ In addition, trunk tissue fibrosis and muscle weakness carry the potential for postoperative respiratory failure.⁴⁰ For these reasons, regional anesthesia is preferred over general anesthesia to avoid complications.^{7,31,32,34,40}

Due to distal soft tissue fibrosis, digital blocks can be extremely painful, and the local anesthetic may have less potential to diffuse through the dense soft tissues.³⁴ Wrist blocks have been used successfully; however, some authors advocate for even more proximal blocks (such as scalene or brachial plexus) to avoid diseased soft tissues.^{33,34} It is important to note that patients with SSc can have prolonged sensory blockade after regional anesthesia, lasting up to 24 hours,^{33,40} and patients should be counseled preoperatively.

Local anesthesia with epinephrine is avoided in patients with SSc, given vasculopathy and potential for digital ischemia.^{7,32} If bleeding control is needed for visualization, a proximal arm tourniquet has been used successfully for 1 to 1.5 hours.^{6,31,34} To prevent vascular crisis, special attention should be given to patient warming and operating room temperature.⁴⁰

Conclusion

Systemic sclerosis is a complex autoimmune disease characterized by obliterative vasculopathy and multisystem fibrosis, leading to calcinosis, RP, digital ischemia, tendinopathy, joint arthropathy, and contractures. Surgeons should beware of the increased potential for vascular and wound healing complications, and pay close attention to surgical technique and soft tissue handling. In addition, patients with SSc can

have increased perioperative risks necessitating proper preoperative workup and optimizing local anesthesia when possible. With increasing recognition of this complex disease and the unique surgical considerations it poses, complications can be avoided and surgeons can help improve or maintain hand function in this population.

Ethical Approval

This study did not require approval by our institutional review board.

Statement of Human and Animal Rights

This article does not contain any studies with human or animal subjects.

Statement of Informed Consent

Informed consent was not required for this review article.

Declaration of Conflicting Interests

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References

- Hoogen F, van den Kham D, Franssen J, et al. 2013 classification criteria for systemic sclerosis: an American College of Rheumatology/European League against rheumatism collaborative initiative. *Arthritis Rheum.* 2013;65(11):2737-2747. doi:10.1002/art.38098.
- Assassi S, Mayes MD, Arnett FC, et al. Systemic sclerosis and lupus. *Arthritis Rheum.* 2010;62(2):589-598. doi:10.1002/art.27224.
- Gabrielli A, Avvedimento EV, Krieg T. Scleroderma. *N Engl J Med.* 2009;360(19):1989-2003. doi:10.1056/NEJMra0806188.
- Chander S, Gordon P. Soft tissue and subcutaneous calcification in connective tissue diseases. *Curr Opin Rheumatol.* 2012;24(2):158-164. doi:10.1097/BOR.0b013e32834ff5ed.
- Balin SJ, Wetter DA, Andersen LK, et al. Calcinosis cutis occurring in association with autoimmune connective tissue disease: the Mayo Clinic experience with 78 patients, 1996-2009. *Arch Dermatol.* 2012;148(4):455-462. doi:10.1001/archdermatol.2011.2052.
- Melone CP Jr, McLoughlin JC, Beldner S. Surgical management of the hand in scleroderma. *Curr Opin Rheumatol.* 1999;11(6):514-520.
- Williams AA, Carl HM, Lifchez SD. The scleroderma hand: manifestations of disease and approach to management. *J Hand Surg Am.* 2018;43(6):550-557. doi:10.1016/j.jhsa.2018.03.021.
- Lapner MA, Goetz TJ. High-speed burr debulking of digital calcinosis cutis in scleroderma patients. *J Hand Surg Am.* 2014;39(3):503-510. doi:10.1016/j.jhsa.2013.12.003.
- Chamberlain AJ, Walker NPJ. Successful palliation and significant remission of cutaneous calcinosis in CREST syndrome with carbon dioxide laser. *Dermatol Surg.* 2003;29(9):968-970. doi:10.1046/j.1524-4725.2003.29261.x.
- Cappelli L, Wigley FM. Management of Raynaud phenomenon and digital ulcers in scleroderma. *Rheum Dis Clin North Am.* 2015;41(3):419-438. doi:10.1016/j.rdc.2015.04.005.
- Hachulla E, Clerson P, Launay D, et al. Natural history of ischemic digital ulcers in systemic sclerosis: single-center retrospective longitudinal study. *J Rheumatol.* 2007;34(12):2423-2430.
- Hughes M, Pauling JD. Exploring the patient experience of digital ulcers in systemic sclerosis. *Semin Arthritis Rheum.* 2019;48(5):888-894. doi:10.1016/j.semarthrit.2018.08.001.
- Giuggioli D, Manfredi A, Colaci M, et al. Osteomyelitis complicating scleroderma digital ulcers. *Clin Rheumatol.* 2013;32(5):623-627. doi:10.1007/s10067-012-2161-7.
- Wigley FM. Clinical practice. Raynaud's phenomenon. *N Engl J Med.* 2002;347(13):1001-1008. doi:10.1056/NEJMc013013.
- Stringer T, Femia A. Raynaud's phenomenon: current concepts. *Clin Dermatol.* 2018;36(4):498-507.
- Thompson AE, Shea B, Welch V, et al. Calcium-channel blockers for Raynaud's phenomenon in systemic sclerosis. *Arthritis Rheum.* 2001;44(8):1841-1847. doi:10.1002/1529-0131(200108)44:8<1841::AID-ART322>3.0.CO;2-8.
- Pace CS, Merritt WH. Extended periaxillary sympathectomy: evaluation of long-term outcomes. *Hand.* 2018;13(4):395-402. doi:10.1177/1558944717715119.
- Bello RJ, Cooney CM, Melamed E, et al. The therapeutic efficacy of Botulinum toxin in treating scleroderma-associated Raynaud's phenomenon: a randomized, double-blind, placebo-controlled clinical trial. *Arthritis Rheumatol.* 2017;69(8):1661-1669. doi:10.1002/art.40123.
- Wigley FM, Flavahan NA. Raynaud's phenomenon. *N Engl J Med.* 2016;375:556-565. doi:10.1056/NEJMr1507638.
- Elhai M, Guerini H, Bazeli R, et al. Ultrasonographic hand features in systemic sclerosis and correlates with clinical, biologic, and radiographic findings. *Arthritis Care Res.* 2012;64(8):1244-1249. doi:10.1002/acr.21668.
- Avouac J, Walker U, Tyndall A, et al. Characteristics of joint involvement and relationships with systemic inflammation in systemic sclerosis: results from the EULAR Scleroderma Trial and Research Group (EUSTAR) database. *J Rheumatol.* 2010;37(7):1488-1501. doi:10.3899/jrheum.091165.
- Khanna PP, Furst DE, Clements PJ, et al. Tendon friction rubs in early diffuse systemic sclerosis: prevalence, characteristics and longitudinal changes in a randomized controlled trial. *Rheumatology.* 2010;49(5):955-959. doi:10.1093/rheumatology/kep464.
- Rodnan GP, Medsger TA. The rheumatic manifestations of progressive systemic sclerosis (scleroderma). *Clin Orthop Relat Res.* 1968;57:81-93.
- Stoenoiu MS, Housiau FA, Lecouvet FE. Tendon friction rubs in systemic sclerosis: a possible explanation—an ultrasound

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- and magnetic resonance imaging study. *Rheumatology*. 2013; 52(3):529-533. doi:10.1093/rheumatology/kes307.
25. Doré A, Lucas M, Ivanco D, et al. The significance of palpable tendon friction rubs in early diffuse cutaneous systemic sclerosis. *Arthritis Care Res*. 2013;65(8):1385-1389. doi:10.1002/acr.21964.
 26. Baron M, Lee P, Keystone EC. The articular manifestations of progressive systemic sclerosis (scleroderma). *Ann Rheum Dis*. 1982;41(2):147-152. doi:10.1136/ard.41.2.147.
 27. Avouac J, Guerini H, Wipff J, et al. Radiological hand involvement in systemic sclerosis. *Ann Rheum Dis*. 2006;65(8):1088-1092. doi:10.1136/ard.2005.044602.
 28. Low AHL, Lax M, Johnson SR, et al. Magnetic resonance imaging of the hand in systemic sclerosis. *J Rheumatol*. 2009;36(5):961-964. doi:10.3899/jrheum.080795.
 29. La Montagna G, Sodano A, Capurro V, et al. The arthropathy of systemic sclerosis: a 12 month prospective clinical and imaging study. *Skeletal Radiol*. 2005;34(1):35-41. doi:10.1007/s00256-004-0830-6.
 30. Jones NF, Imbriglia JE, Steen VD, et al. Surgery for scleroderma of the hand. *J Hand Surg Am*. 1987;12(3):391-400. doi:10.1016/s0363-5023(87)80012-6.
 31. Lipscomb PR, Simons GW, Winkelmann RK. Surgery for sclerodactylia of the hand: experience with six cases. *J Bone Joint Surg Am*. 1969;51(6):1112-1117.
 32. Melone CP Jr, Dayan E. Articular surgery of the ischemic hand in systemic scleroderma: a vascular basis for arthrodesis and arthroplasty. *J Hand Surg Am*. 2018;43(6):574.e1-574.e9. doi:10.1016/j.jhssa.2018.03.008.
 33. Gilbert MK, Jolles BM, Lee P, et al. Surgery of the hand in severe systemic sclerosis. *J Hand Surg Br*. 2004;29(6):599-603. doi:10.1016/j.jhsb.2004.03.013.
 34. Bogoch ER, Gross DK. Surgery of the hand in patients with systemic sclerosis: outcomes and considerations. *J Rheumatol*. 2005;32(4):642-648.
 35. Politikou O, Giesen T, Reissner L, et al. Hand and wrist joint procedures in patients with scleroderma: a systematic review. *J Hand Surg Eur Vol*. 2019;44(4):402-407. doi:10.1177/1753193418795632.
 36. Tagliafico A, Panico N, Resmini E, et al. The role of ultrasound imaging in the evaluation of peripheral nerve in systemic sclerosis (scleroderma). *Eur J Radiol*. 2011;77(3):377-382. doi:10.1016/j.ejrad.2009.08.010.
 37. Nimitbantha T, Sirasaporn P, Wattanapan P, et al. The prevalence of median neuropathy at wrist in systemic sclerosis patients at Srinagarind Hospital. *J Sci Soc*. 2015;42(3):180. doi:10.4103/0974-5009.165566.
 38. Amaral TN, Peres FA, Lapa AT, et al. Neurologic involvement in scleroderma: a systematic review. *Semin Arthritis Rheum*. 2013;43(3):335-347. doi:10.1016/j.semarthrit.2013.05.002.
 39. Bignotti B, Ghio M, Panico N, et al. High-resolution ultrasound of peripheral nerves in systemic sclerosis: a pilot study of computer-aided quantitative assessment of nerve density. *Skeletal Radiol*. 2015;44(12):1761-1767. doi:10.1007/s00256-015-2230-5.
 40. Dempsey ZS, Rowell S, McRobert R. The role of regional and neuroaxial anesthesia in patients with systemic sclerosis. *Local Reg Anesth*. 2011;4:47-56. doi:10.2147/LRA.S23808.

Review Article

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Kienbock's disease: preventing disease progression in early-stage disease

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Abstract

Currently Kienbock's disease remains an 'unsolved' problem in hand surgery. Different factors have been associated with the avascular necrosis of the lunate. Mechanical, vascular and biological factors, alone or in combination, may have an influence in the aetiopathogenesis and determine the progress of the disease and even the results of the treatment. This is especially relevant in the early stages, in which conservative or surgical treatment may modify the natural history of the disease, maintaining the lunate structure and thus preserving the joint surfaces. There are multiple surgical treatments for Kienbock's disease in the early stages, before lunate collapse; each one is based on one of the possible factors that can cause avascular necrosis of the lunate. The objective is not only to treat symptoms but to prevent progression. This article is a review of the most frequent treatments used in the early stages and a personal view of the authors.

Level of evidence: V

Keywords

Lunate, Kienbock, avascular necrosis, lunatomalacia, early stage, surgery

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Introduction

Avascular necrosis of the lunate (lunatomalacia) was described more than 100 years ago, but its aetiology still remains uncertain and no consensus has been reached on the treatment of the condition. The disparity of treatments is especially significant in the early stages, with many techniques being described to prevent progression to carpal collapse and osteoarthritis.

Different theories have been proposed to explain the aetiopathogenesis of Kienbock's disease (KD). Mechanical, vascular and biological factors or a combination of them have been described as predisposing factors for the development of KD. However, the role of each of them in an individual remains to be clearly defined (Lichtman and Bain, 2016).

This lack of evidence, and the multiple factors that may be involved in the aetiopathogenesis of KD, explain the large number of surgical treatments that are current. The main goals of the treatment in the early stages are not only to improve symptoms

but to prevent progression by modifying the disease itself, in an attempt to stop the osteonecrosis and collapse of the lunate and wrist, thus preserving the joint surfaces and prolonging the life of the joint.

This article does not pretend to be a guide of treatment in the so-called early stages of KD (Stages I and II of Lichtman's classification and Stages 0 and 1 of Begg and Bain's classification),

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but to be an update of the most frequently used treatments and the personal view of the authors about what remains a challenging problem.

Case report

A 30-year-old right-hand dominant woman presented with a 5-month history of left wrist pain after a minor injury. The pain had been intensifying over the previous 2 months. She had 70° of wrist extension, 60° of wrist flexion, a full range of digital motion and tenderness overlying the central dorsal aspect of the wrist with no other findings on physical examination.

Radiographs showed no abnormalities, with a positive ulnar variance of 2 mm (Figure 1(a)). There was no carpal misalignment or arthritic changes in the wrist. Magnetic resonance imaging (MRI) showed changes in bone marrow signal intensity as an area of hyperintensity on T2-weighted images and an area of hypointensity on T1-weighted images (Figure 1(b)). With this finding, Lichtman Stage I and Schmitt Stage A KD was diagnosed with a positive ulnar variance. The patient did not respond to conservative treatment. An arthroscopic examination (that confirmed a Begg and Bain Stage 0) and metaphyseal distal radial core decompression were done (Figure 1(c)). The pain improved after the operation. Complications of the procedure occurred with transient paraesthesia of the sensory branch of the radial nerve that resolved spontaneously 6 months after surgery, and De Quervain's tendonitis that resolved with a cortisone injection.

At 7-year follow-up radiographs revealed no radiological progression (Figure 1(d)), and MRI reverted to a normal image study (Figure 1(e)). The visual analogue score at rest was 0/10, and 2/10 with activity. The patient had 75° of extension, 80° of flexion, 14° radial deviations, 40° ulnar deviation and full forearm rotation. The DASH score was 2.27.

Aetiopathogenesis

In 1910, the radiologist Robert Kienbock's published the first clinical series and radiologic features of an entity he named *lunatomalacia* (Kienbock, 1910; Peltier, 1980). At present, the aetiology of KD is still not established, with many hypotheses being proposed during the subsequent decades. Ulnar variance, radial inclination, lunate morphology and its relation with intraosseous trabecular anatomy and ulnar length, lunate size or repeated trauma are some of the mechanical factors described as having an influence in the development of KD. But also, vascular or biological factors such as a single arterial

supply to the bone, poor intraosseous anastomoses or a hypercoagulability status have been postulated to favour the disease [Antuña Zapico, 1993; Garcia-Elias et al., 1998; Gelberman et al., 1980; Kristensen et al., 1986; Tsuge and Nakamura, 1993] (Tables 1–3). Recently, the main aetiopathogenic theory is that repeated stresses to the lunate may induce a raised intraosseous pressure, which causes cessation of arterial blood flow and leads to hypoperfusion [Bain et al., 2016b; Lichtman et al., 2017]. This situation, similar to a bony "intracompartmental syndrome", may cause a progressive ischaemia, which can lead to interstitial oedema and necrosis of marrow fat.

What can be deduced from published studies is that the pathogenesis of the disease cannot be attributed to one single cause. It seems more likely that a combination of risk and triggering factors is required [Lluch and Garcia-Elias, 2011].

These are some of the authors' thoughts regarding aetiopathogenesis based on their clinical observations.

Wrists of the same individual are usually anatomically similar, if not identical. So, if any anatomical feature was a critical and exclusive factor, we would expect to see more cases of bilateral KD than we actually do.

KD secondary to ulnar shortening or distal ulna resection, procedures in which a negative or short ulna is created, has not been described.

In the frequent scenario of ulnocarpal impaction, the over compressed area of the lunate may develop chondral damage and deformity, but fragmentation and collapse never occur. Nor does it happen when intraosseous cysts are located in the lunate. Therefore, overloading does not seem to be a unique aetiological factor.

KD may occur in patients with ulnar positive variance.

Severe traumatic injuries, such as perilunate dislocations, very seldom cause lunate ischaemia or necrosis. But when it does occur, the radiological and magnetic resonance imaging findings are different from those seen in KD.

Severe ligament destruction is frequently seen in rheumatoid diseases, which implies severe disruption of the extraosseous vascular network. Yet, in patients with rheumatoid arthritis, lunatomalacia almost never occurs.

In summary, the best we can say at this moment is that Trueta was probably right in 1939, when he stated that behind the disease there is always a vicious circle involving focal osteolysis, fracture and

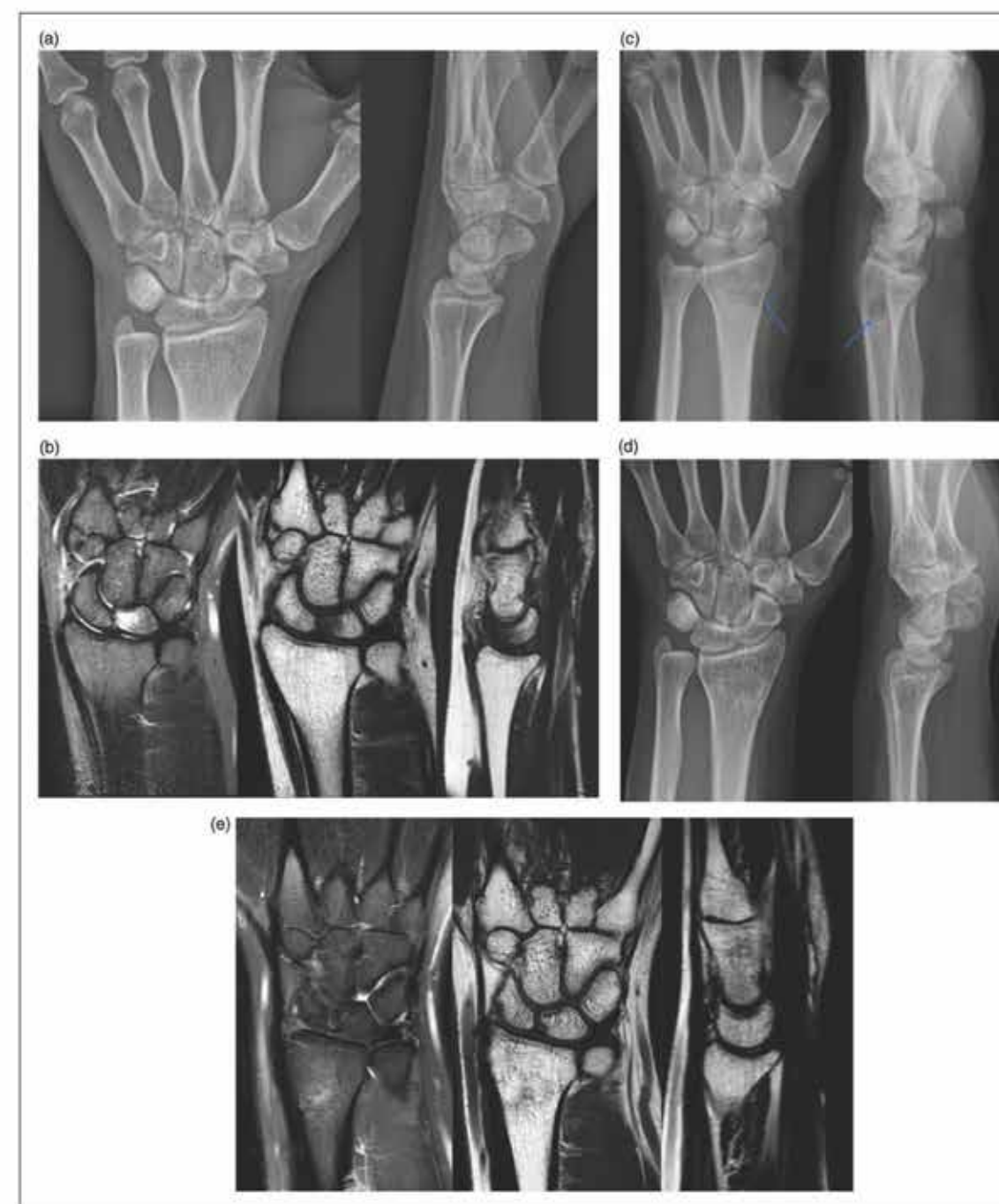


Figure 1. (a) Normal radiograph at the time of the diagnosis. (b) Initial MRI showing an area of hyperintensity on T2-weighted image and an area of hypointensity on T1-weighted images. (c) Postoperative radiograph of the wrist showing the cortical window in the lateral aspect of the radius, used for the metaphyseal core decompression (blue arrow). (d) Radiograph at 7 years follow-up with normal appearance of the wrist and (e) MRI at 7 years, with normal intensity of the lunate in T2 and T1-weighted images.

Table 1. Mechanical factors associated with the development of Kienbock's disease.

Factors	Author	Observations
Extrinsic	Negative ulna variance	Chung (2001): No data to support the theory (a) and (b) are opposite
	Radial inclination	
	Radiolunate coverage index	
Intrinsic	Repetitive load trauma	Antuña Zapico (1993) Tsuge and Nakamura (1993)
	Lunate shape	
	Lunate size	

Table 2. Vascular factors associated with Kienbock's disease.

Vascular factors (at subchondral level)	Author
Inflammatory coagulation activation	Jurado, 2001
Repetitive ischemia episode	Aspenberg, 1994
Impaired venous return	Schiltenswolf, 1996
Synovitis	

Table 3. Other factors associated to with Kienbock's disease.

Factors
Coagulation disorder
Long term steroid treatment
Fat emboli
Abnormal lipid metabolism
Steroid induced hypercoagulability
Genetic background
Osteomyelitis of low grade
Viral aetiology

necrosis [Trueta, 1939]. We still do not know which of these three elements occurs first.

Natural history

The natural history of KD also remains incompletely understood. Nevertheless, a knowledge of it is important in deciding whether the suggested disease-modifying treatments can be beneficial.

There are some observations to consider regarding the natural history of KD.

Progression of lunate osteonecrosis can ultimately lead to proximal row instability, carpal central column collapse and arthropathy. What remains uncertain is: how frequently the process stops before collapse; the chronology of active changes

in the lunate; and how often the process arrests at each radiographic stage.

The diagnosis of KD is based on radiographic imaging. Nevertheless, KD is occasionally diagnosed by chance on radiographs obtained for other reasons. Cases of incidental radiographic KD accumulate with age and are associated with relatively less collapse [van Leeuwen et al., 2016a].

Not all patients with radiographic evidence of the disease are symptomatic enough to consult a doctor [van Leeuwen et al., 2016a].

KD can be asymptomatic. Although patients with no symptoms are more likely to have early stages of the disease, the radiographic features do not always correspond with symptom intensity and magnitude of disability.

Subchondral radiolucent 'crescent lines' probably correspond to the osteoclastic resorption of the necrotic bone region during revascularization of the lunate. We may consider this situation as a partial or reversible lunate ischaemia [Lluch and Garcia-Elias, 2011].

It is not clear whether the lunate fracture lines seen in the advanced stages of KD, when the lunate has developed an irreversible osteonecrosis, represent a primary event or occur later, when revascularization and resorption of the necrotic bone have caused structural weakness [van Leeuwen et al., 2016a].

KD sometimes ceases with relatively little collapse. So, at the time of a new diagnosis of KD, the surgeon cannot distinguish active disease that is at risk of collapse, which might benefit from disease-modifying treatment, from old quiescent disease that may not.

Staging of KD

The most widely used classification has been the four-stage classification described by Lichtman et al. [1977] and subsequently modified several times. As it is based on plain radiographs, and describes the osseous morphological characteristics

of the lunate and the carpal bones during the disease, it has been considered to be an osseous classification [Lichtman et al., 2010] (Table 4). The addition of arthroscopic and MRI findings has provided a more comprehensive understanding of the natural history of KD [Lichtman et al., 2017]. Taking into account the number of non-functional articular surfaces, Bain and Begg (2016) developed an arthroscopic four-stage classification. As it based on the cartilage status, it has been considered to be a cartilage classification (Table 5). More recently, based on the signal intensity in different zones of the lunate on gadolinium-enhanced MRI, Schmitt et al. [2019] developed a three-stage classification. As it assesses the bone marrow viability, it has been considered to be a vascular, perfusion or viability classification. A combination of the osseous, vascular and cartilage classifications has been suggested to create an algorithm for the assessment and treatment of KD [Lichtman et al., 2017] (Table 4).

What an 'early stage' is in the precollapsed KD is not well defined. Some authors consider early stages as Lichtman Stages I, II and IIIa [Innes and Strauch, 2010]. The most recent treatment algorithm that incorporates the three classifications mentioned refers to early stages as those with a so-called 'intact lunate', which is a structurally undamaged lunate and with no cartilage changes at the midcarpal and the radiocarpal joints. These patients are classified as Lichtman Stages 0, I and II, Bain and Begg Stage 0 and Schmitt Stage A [Lichtman et al., 2017].

Treatment of KD

Some conditions can predispose to KD and influence the indication and clinical outcomes of the different treatments.

Table 4. The radiographic Kienbock's disease classification of Lichtman et al. [1977].

Stage	Features
0	Intermittent ischaemia, normal radiographs with transient pain
I	Marrow changes without radiographic changes
II	Osteonecrosis with radiographic changes; no lunate collapse
III	
IIIA	Osteonecrosis with collapse. Preserved carpal alignment and height
IIIB	Carpal collapse with fixed scaphoid rotation, proximal capitate migration
IIIC	Coronal lunate fracture
IV	Radiocarpal or midcarpal degenerative arthritis

Different morphological factors may increase loading on the radial aspect of the proximal lunate, inducing shearing forces [Antuña Zapico, 1993; Bain et al., 2016a]. The most frequently described seems to be negative ulnar variance. Van Leeuwen et al. [2016b] found that negative ulnar variance was associated with advanced stages of KD. Others features are: an 'uncovered' lunate overhanging the lunate fossa; a lunate with a single articular facet for the capitate [Viegas Type 1]; location of the capitate in a more radial direction [Viegas et al., 1990]; and Antuña-Zapico Type 1 lunates (associated with ulnar-negative wrists) [Antuña Zapico, 1993; Bain et al., 2016b].

Lunate morphology may also affect the severity of KD. As an example, coronal fractures seem to be less frequent in Viegas Type 2 lunates [Rhee et al., 2015].

Age and gender also influence the prognosis of KD.

Irisarri et al. [2010] divided paediatric KD into infantile (12 years and younger) and juvenile (13 years to skeletal maturity). All the patients in the infantile group had excellent outcomes when treated conservatively. In the juvenile group, 30% progressed when treated by immobilization and finally required a joint-leveling procedure [JLP]. In elderly patients, KD behaves differently from children and other adults. Taniguchi et al. [2003] found KD to be more prevalent in women than in men, although the incidence of negative ulnar variance was lower. They concluded that in their series some aetiological factors other than those classically described might have had a role.

Therefore, not only the stage of the disease, but also anatomical and individual conditions influence the choice of the optimal treatment. The most common treatment options in the early stages of

Table 5. Bain and Begg (2006) arthroscopic classification of Kienbock's disease.

Grade	Features
0	Articular surfaces are normal
1	Proximal surface of lunate abnormal
2	
2A	Proximal surface of the lunate and lunate fossa of radius abnormal
2B	Frontal fracture of lunate
3	Lunate fossa of radius and proximal and distal surfaces of lunate abnormal
4	Lunate fossa of radius and proximal and distal surfaces of the lunate and the proximal surface of capitate abnormal

KD are: conservative treatment; JLPs; core decompression of the radius or the lunate; capitate osteotomy; arthroscopy; and vascularized bone grafts (VBGs).

Conservative treatment in the early stages of KD

Rationale. Although many case series suggest improvement of symptoms after different operations, none are able to show that this improvement does not simply reflect the natural history of the disorder. Furthermore, several series in patients with conservatively treated KD show clinical improvement regardless the radiological stage (Beckenbaugh et al., 1980; Delaere et al., 1998; Evans et al., 1986). These studies may call into question the statement that surgery alone improves symptoms (Dias and Lunn, 2010).

Indications. Rigid splinting and analgesia are still indicated in all cases of KD as an initial treatment. As previously mentioned, younger patients have a different natural history. The good revascularization potential and remodelling capacity of the lunate in skeletally immature patients is the reason why immobilization is the recommended treatment in patients younger than 15 years (Irisarri et al., 2010). In contrast, in patients between 16 and 20 years, conservative treatment is less successful, but the prognosis in these patients with surgical treatment seems to be better than that in adults (Irisarri et al., 2010; Lichtman and Bain, 2016).

Some earlier studies supported the role of conservative treatment rather than surgery in KD. In a cohort of 120 high-demand patients suffering from KD, Saffar and Gentaz (1982) reported that acute pain normally disappeared after 15 days of immobilization, and afterwards the degree of pain was variable. Interestingly, more of those treated conservatively kept their job than those treated surgically (Saffar and Gentaz, 1982). Delaere et al. (1998) retrospectively compared 21 cases treated surgically for advanced KD with six different techniques (including scaphotrapezotrapezoid (STT) fusion and proximal row carpectomy) with 22 cases treated conservatively. After a mean follow-up of 65 months, surgery did not show any superiority to conservative treatment and was responsible for a loss of mobility of 24%, and for a change in social activities in about a quarter of the patients, whereas grip strength was only slightly improved. Consequently, they suggested that the surgical indications for KD should be carefully considered, keeping in mind their morbidity and the relatively benign natural course of the disease in some cases.

Authors' preference. The authors agree that conservative treatment with splinting and analgesia should be used in all cases of KD as the first line of treatment. The time of immobilization varies depending on the effectiveness. It should be used full time in the first 2 weeks, and after that depending on the symptoms, but keeping the splint on at night for 2 or 3 months. If symptoms persist after this period of conservative treatment, surgical treatment may be indicated.

Operative treatment in the early stages of KD

Wrist JLPs. The most common procedures used for patients with intact lunates (B1 from the new classification of Lichtman and Bain) who do not improve with non-operative procedures are osteotomies of the radius or ulna.

Rationale. These techniques are included in the group of lunate unloading procedures and are frequently referred to as JLPs. Lunate unloading procedures are designed to protect the lunate and promote spontaneous revascularization and include the technique of capitate shortening, which will be described later. JLPs initially had the goal of achieving neutral ulnar balance in cases of negative ulnar variance, to counteract the predisposing effect for developing KD described by Hulten in the late 1920s (Hulten, 1929). Although there is much doubt about this concept, these techniques do mechanically decompress the lunate in different degrees (Camus et al., 2020) and usually provide good functional results compared with the unpredictable long-term natural course of KD (Viljakka et al., 2014). Other procedures focused on treating the biological aspect of KD, such as VBGs, can be combined with a JLP in a multimodal approach and salvage procedures can still be performed if needed. However, JLPs do not seem to alter the radiological progression of KD in Lichtmann's classification when compared with non-operative treatment (Ho Shin et al., 2018).

Indications. JLPs are currently proposed when there is an intact lunate with a negative or neutral ulnar variance or an abnormal radial inclination, or both. It is not clear whether patients with Lichtman Stages IIIA or even IIIB KD benefit from JLPs, but good long-term results have been described with the procedures (Botelho et al., 2019).

The most common JLPs include radial shortening osteotomies, radial wedge osteotomies and ulnar lengthening osteotomies. The authors believe that

ulnar lengthening osteotomies should not be recommended, as they do not provide better results compared with radial procedures, and also have an increased risk of nonunion and a need for bone grafting.

Radial shortening osteotomy. The goal is to achieve a neutral post-osteotomy variance, with a shortening that correlates with the degree of ulnar negative variance (typically no more than 2–3 mm of shortening). Anterior anatomical plates provide solid fixation, allow compression at the osteotomy site and avoid the need for routine removal of the dorsal plates that were used in the past. Osteotomy is better done in the metaphyseal area, proximal to the distal radioulnar joint (DRUJ).

Radial wedge osteotomy. Several types of radial wedge osteotomies have been described. A *lateral closing wedge osteotomy* can combine shortening with reduction of radial inclination in ulnar negative variance wrists, or just decrease radial inclination in cases of neutral or positive ulnar variance (Figure 2). The *single cut osteotomy* produces shortening by a single and oblique cut proximal to the DRUJ, and is fixed with a pre-drilled screw entering from the radial styloid (Bain et al., 2020) (Figure 3). The *biplanar, step-cut or Z-osteotomy* allows a two-plane correction, reducing radial inclination and increasing the lunate covering ratio. Because it is technically more demanding, fixation is more difficult and union is not so easily achieved, the authors do not recommend it. A *very distal radial wedge osteotomy* is a lateral closing wedge with the apex of the wedge just distal to the DRUJ, to avoid an incongruous joint (Okubo et al., 2017) (Figure 4). The *selective shortening wedge osteotomy* or 'camembert' osteotomy shortens only the part of the radius facing the lunate, offloading the bone without decompressing the scaphoid as is done in the other osteotomies. It

may need an associated ulnar wedge osteotomy, but it has the most beneficial biomechanical effect (Camus et al., 2020).

Authors' preference. In the case of a significant ulnar negative variance and an intact lunate, a shortening osteotomy with or without decreasing the radial inclination would be our preferred JLP. In cases of mild ulnar negative variance, a single cut osteotomy would be our choice. If an osteotomy is to be done when there is an ulnar positive variance, a very distal osteotomy would be our recommendation, although in those cases we probably would support other types of procedures, such as metaphyseal decompression.

Individual consideration of other associated procedures, in a multimodal approach, is strongly recommended, especially in Lichtman's Stages I and II. In any complete osteotomy that requires plating, the use of three-dimensional planning allows the desired correction to be precisely defined and facilitates the surgical procedure.

Capitate shortening osteotomy

Rationale. Many biomechanical studies have demonstrated that a capitate shortening osteotomy (CSO) effectively unloads the lunate and radiolunate joint (An, 1993; Camus et al., 2020) without overloading the radioscaphoid or ulnocarpal joints. Despite that, the authors have very seldom performed this type of osteotomy. The main reason for that is because the exact indication for the procedure is narrow, and those cases can probably be treated with an extracapsular procedure. Other reasons include the paucity of published data, the potential negative effect on midcarpal alignment and the risk of endangering the blood supply of the proximal pole of the capitate, although there is no evidence to support the two

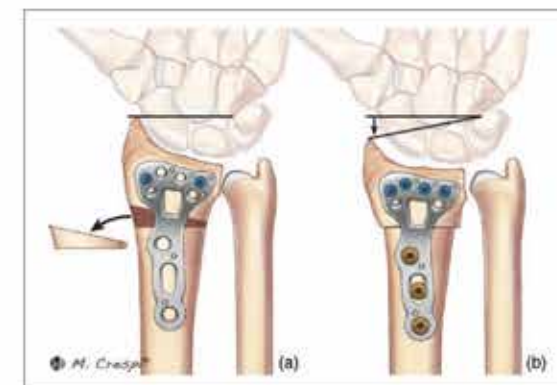


Figure 2. Lateral closing wedge radial osteotomy.

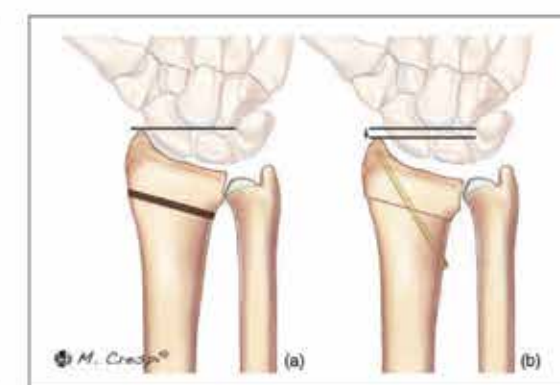


Figure 3. Single cut radial osteotomy.

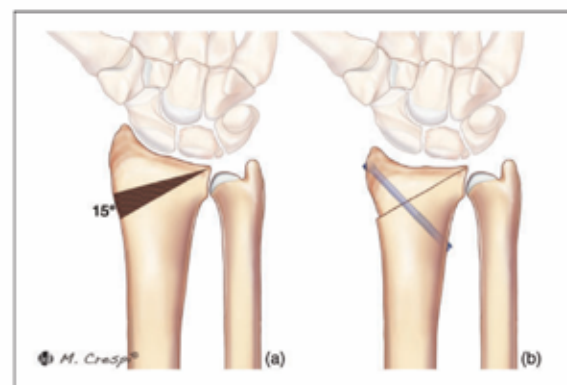


Figure 4. Very distal radial wedge osteotomy.

latter considerations. The unloading effect of this osteotomy may decrease the risk of lunate fractures when the bone becomes avascular and weaker, protect it during possible natural revascularization and favour revascularization secondary to regional wrist hyperaemia [Bain et al., 2020].

Indications. CSO is indicated when KD occurs in ulna positive wrists, and may also be indicated in neutral variance [Almqvist, 1986]. The best outcomes of the procedure are expected in the early stages of the disease, when the lunate height is still maintained [Hegazy et al., 2021] and the lunocapitate joint surface is found to be preserved on arthroscopic examination [Bain et al., 2020].

The procedure can be performed in two different ways.

CSO at the level of the STT joint can be done in isolation or combined with other procedures, such as wrist arthroscopy [Bain et al., 2020], capitolunate fusion (to prevent proximal migration of the distal carpal row) [Almqvist, 1986], hamate shortening [Rabarin et al., 2010] and vascularized lunate grafting [Hegazy et al., 2021] when the lunate height is collapsed.

Distal capitate osteotomy at the carpometacarpal joint is combined with a fusion of the capitate to the base of the metacarpals [Hegazy et al., 2019], again trying to prevent proximal migration of the distal carpal row.

Plates, Kirschner wires, staples or screws have been used as fixation methods for both types of osteotomies, with no reported cases of nonunion. Pain, grip strength and functional improvement are usually expected after the procedure, and better outcomes when the procedures are done in the earlier stages [Bain et al., 2020; Hegazy et al., 2021].

Metaphyseal core decompression of the distal radius

Metaphyseal core decompression (MCD) of the distal radius is a simple procedure that consists in an extra-articular impaction of the cancellous bone within the distal metaphyseal area of the distal radius through a cortical window [Illarramendi and De Carli, 2003; Illarramendi et al., 2001]. No mechanical decompression of the lunate is done.

Rationale. Although the mechanism of action of MCD is unclear, Illarramendi and De Carli (2003) suggested that the damage to the bone induced a regional vascular storm, followed by vascular and bone growth and a local liberation of cytokines that increases the lunate revascularization potential.

Indications. Metaphyseal decompression technique has been indicated in early stages of KD with any type of ulnar variance. It can be used as an isolated technique or in association with other procedures, such as vascularized grafts [Jorquera and Azocar, 2020], and has also been considered as an alternative for Stage IIIA [De Carli et al., 2017]. This straightforward extra-articular technique has produced similar long-term results to vascularized bone grafting or JLPs in the early stages of KD [Innes and Strauch, 2010].

Authors' preference. Owing to its simplicity, MCD is a low morbidity procedure to consider in all cases of early-stage KD, especially when there is neutral or ulna minus variance, in which bone levelling procedures are technically more demanding, or when combined with other procedures.

Arthroscopy, forage and bone grafting

Rationale. Over the last two decades, the use of arthroscopy has gained popularity in the diagnosis and treatment of KD. Wrist arthroscopy allows a precise staging of KD, the performance of a forage of the lunate in the early stages, or debridement of the necrotic portions of the lunate along with an arthrolysis in advanced stages [Bain and Begg, 2006; Bain et al., 2016a; MacLean et al., 2017; Menth-Chiari et al., 1999].

Watanabe et al. [1995] first described the use of wrist arthroscopy in the assessment of KD. They found a correlation between the incidence of interosseous ligament tears and the radiographic stage, but they noted that cartilage damage was underestimated when based on preoperative radiographs [Watanabe et al., 1995].

The first reports of the therapeutic use of arthroscopy in KD were in the treatment of the advanced stages. Arthroscopic debridement increased the functional range of motion, provided excellent pain relief and improved health-related quality of life in all patients, but it did not prevent radiographic progression of the disease in Lichtman IIIA or IIIB [Menth-Chiari et al., 1999]. Regarding the arthroscopic treatment of KD in early stages, Pegoli et al. [2011] reported three patients with a diagnosis of Lichtman Stage I treated by arthroscopic debridement and autologous bone grafting. At 13.5 months follow-up, clinical improvement was observed, with radiographs showing normal density of the lunate with no arthritic changes. However, patients were not asymptomatic. Bain et al. [2011] also proposed lunate core decompression as an option in ulnar neutral and ulnar positive KD.

Indications. The indication for arthroscopic lunate debridement and bone grafting is an early stage with an ulnar-neutral or ulnar-positive variance [Bain et al., 2011]. Although it is not known whether core decompression of the lunate will alter the natural history of KD, it offers a valuable minimally invasive alternative in patients with early stage of the disease, can be combined with extra-capsular procedures and does not preclude further treatments in the future in case of progression.

Authors' preference. The authors always include arthroscopic assessment of the radiocarpal and midcarpal joints, with synovectomy and debridement if needed, as the first step and combined with any other extra-articular planned procedure in the early stages of KD.

Vascularized bone grafts

Rationale. Revascularization of the necrotic lunate by the wrongly named VBGs (they are actually flaps) is focused on treating the biological aspect of KD as they provide direct blood flow and healthy bone. Direct revascularization of the lunate can be performed with either a pedicle graft or a free VBG and can be combined with JLPs.

Indications. Pedicled VBGs are indicated in patients with an intact lunate, as an intact cartilaginous shell is essential for their effectiveness. Favourable long-term results have been reported with VBGs in Stage III and some authors advocate their use in Stage IIIB [Fujiwara et al., 2013]. VBGs may be used as a stand-alone treatment in ulna neutral and positive variance cases or in combination with both joint-levelling

[Quenzer et al., 1997] and decompression procedures [Jorquera and Azocar, 2020].

Several types of revascularization procedures have been proposed for KD, including vascularized pisiform grafts [Daecke et al., 2005], vascularized pedicle grafts from the distal radius [Mathoulin and Wahegaonkar, 2009; Moran et al., 2005], direct implantation of metacarpal arteries, index or middle metacarpal base bone grafts and free VBGs from the medial femoral condyle [Higgins and Bürger, 2016] or iliac crest [Gabl et al., 2016]. The dorsal distal radius is a common source of VBGs for the treatment of KD. The VBG using the fourth and fifth extensor compartment arteries is mainly used because of its long pedicle length, large pedicle diameter and relative ulnar location [Kolovich et al., 2016; Moran et al., 2005]. In addition to vascularized grafts, an unloading procedure is commonly associated to reduce mechanical stresses on the lunate with temporary pinning of the midcarpal joint [Elhassan and Shin, 2009].

Significant improvement in clinical features has been reported after VBG in early-stage patients [Innes and Strauch, 2010]. A recent systematic review, which included 92 patients treated with VBGs, reported improvement in grip strength and pain with no effect on the range of motion [Tsantes et al., 2019]. So far there have been no prospective studies comparing different types of VBGs.

Authors' preference. After using VBGs for several years, we now believe that lunate unloading and decompression procedures are simpler and offer comparable results as has been reported [Tsantes et al., 2019]. Furthermore, some of the VBGs can be technically demanding and there is a learning curve. They may be an alternative in patients in whom less invasive treatments have failed.

Conclusions

KD treatment in the early stages, in which preventing the progression is the key to success, remains an 'unsolved problem'. The truth is that the real reason for KD is still unknown. Indeed, until we discover which factor triggers this intriguing disease, we will not be able to solve the problem completely. Uncertainty about the capability of surgery to modify the progression makes conservative treatment the first treatment to be considered at the time of diagnosis.

Lack of evidence regarding the best surgical treatment for the early stages of KD leads the authors to recommend procedures with proven benefit but

with less morbidity and which do not preclude other treatments in the case of progression. The authors strongly recommend considering the possibility of combining procedures in a multi-modal approach.

A MCD, either alone or combined with other procedures, should be considered in all cases of early stages of KD, but especially in ulna plus variance. JLPs, either alone or combined with other procedures, should be considered in all cases of early stages of KD, but especially in ulna minus or neutral variance.

A CSO biomechanically unloads the lunate but is an intracapsular procedure that has to be done is the simplest and least risky way.

Arthroscopy is the key tool for identifying the functional articular surfaces that define early stages of KD.

VBGs should be reserved for cases in which previous techniques have failed and should be done only by experienced surgeons.

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References

- Almqvist EE. Kienbock's disease. Clin Orthop Relat Res. 1986; 202: 68-78.
- An KN. The effect of force transmission on the carpus after procedures used to treat Kienbock's disease. Hand Clin. 1993; 9: 445-54.
- Antuña Zapico J. Enfermedad de Kienbock. Rev Ortop Traumatol. 1993; 37: 100-13.
- Aspenberg P, Wang JS, Jonsson K, et al. Experimental osteonecrosis of the lunate: revascularization may cause collapse. J Hand Surg. 1994; 19B: 565-9.
- Bain GI, Begg M. Arthroscopic assessment and classification of Kienbock's disease. Tech Hand Up Extrem Surg. 2016; 10: 8-13.
- Bain GI, MacLean SB, Yeo CJ, Perilli E, Lichtman DM. The Etiology and Pathogenesis of Kienbock Disease. J Wrist Surg. 2016a; 5: 248-54.
- Bain GI, Krishna SV, Maclean Murdoch BS, Agrawal P. Single-cut single-screw capitate-shortening osteotomy for Kienbock's disease. J Wrist Surg. 2020; 1: 276-82.
- Bain GI, MacLean S, Tse W-L, Ho P-C, Lichtman D. Kienbock disease and arthroscopy: assessment, classification, and treatment. J Wrist Surg. 2016b; 5: 255-60.
- Bain GI, Smith ML, Watts AC. Arthroscopic core decompression of the lunate in early stage Kienbock disease of the lunate. Tech Hand Up Extrem Surg. 2011; 15: 66-9.
- Beckenbaugh RD, Shives TC, Dobyns JH, Linscheid RL. Kienbock's disease: the natural history of Kienbock's disease and consideration of lunate fractures. Clin Orthop Relat Res. 1980; 149: 98-106.
- Botelheiro JC, Silverio S, Neto AL. Treatment of advanced Kienbock's disease [Lichtman Stage IIIB with carpal collapse] by a shortening osteotomy of the radius: 21 cases. 2019; 8: 264-7.
- Camus EJ, Aïmar A, Van Overstraeten L, Schuind F, Innocenti B. Lunate loads following different osteotomies used to treat Kienbock's disease: a 3D finite element analysis. Clin Biomech. 2020; 78: 105090.
- Chung KC, Spilson SV, Kim HM. Is negative ulnar variance a risk factor for Kienbock's disease? A meta-analysis. Ann Plast Surg. 2001; 47: 494-9.
- Daecke W, Lorenz S, Wietoch P, Jung M, Martini AK. Vascularized OS pisiform for reinforcement of the lunate in Kienbock's disease: an average of 12 years of follow-up study. J Hand Surg Am. 2005; 30: 915-22.
- De Carli P, Zaidenberg EE, Alfie V, Donndorff A, Boretto JG, Gallucci GL. Radius Core Decompression for Kienbock Disease Stage IIIA: Outcomes at 13 Years Follow-Up. J Hand Surg Am. 2017; 42: 752.e1-6.
- Delaere O, Dury M, Molderez A, Foucher G. Conservative versus operative treatment for Kienbock's disease: A retrospective study. J Hand Surg Br. 1998; 23B: 33-6.
- Dias JJ, Lunn P. Ten questions on Kienbock's disease of the lunate. J Hand Surg Eur. 2010; 35: 538-43.
- Elhassan BT, Shin AY. Vascularized bone grafting for treatment of Kienbock's disease. J Hand Surg Am. 2009; 34: 146-54.
- Evans G, Burke FD, Barton NJ. A comparison of conservative treatment and silicone replacement arthroplasty in Kienbock's disease. J Hand Surg Am. 1986; 11: 98-102.
- Fujiwara H, Oda R, Morisaki S, Ikoma K, Kubo T. Long-term results of vascularized bone graft for Stage III Kienbock disease. J Hand Surg Am. 2013; 38: 904-8.
- Gabl M, Lutz M, Reinhardt C, Zimmerman R, Pechlaner S, Hussl H, Rieger M. Stage 3 Kienbock's disease: reconstruction of the fractured lunate using a free vascularized iliac bone graft and external fixation. J Hand Surg Br. 2002; 27: 369-73.
- García-Elias M, An KN, Cooney WP, Linscheid RL. Lateral closing wedge osteotomy for treatment of Kienbock's disease: a clinical and biomechanical study of the optimum correcting angle. Ann Chir La Main Du Memb Sup. 1998; 17: 283-90.
- Gelberman RH, Bauman TD, Menon J, Akeson WH. The vascularity of the lunate bone and Kienbock's disease. J Hand Surg Am. 1980; 5: 272-8.
- Hegazy G, Akar A, Abd-Elghany T, Zayed E, Shaheen E, Mansour T. Treatment of Kienbock's disease with neutral ulnar variance by distal capitate shortening and arthrodesis to the base of the third metacarpal bone. J Hand Surg Am. 2019; 44: 518.e1-9.
- Hegazy G, Seddik M, Massoud AH et al. Capitate shortening osteotomy with or without vascularized bone grafting for the treatment of early stages of Kienbock's disease. Int Orthop. 2021; 45: 2635-41.
- Higgins JP, Bürger HK. Osteochondral free flap reconstruction of advanced Kienbock's disease. In: Lichtman DM, Bain GI [Eds.] Kienbock's disease. Advances in diagnosis and treatment. Switzerland, Springer, 2016: 215-25.
- Ho Shin Y, Kwang Kim J, Han M, Kyoong Lee T, Yoon JO. Comparison of long-term outcomes of radial osteotomy and nonoperative treatment for Kienbock disease. J Bone Jt Surg Am. 2018; 100: 1231-40.
- Hulten O. Über Anatomische Variationen der Handgelenkknöchen. Ein Beitrag zur Kenntnis der Genese zwei Verschiedener Mondbeinveränderungen. Acta Radiol. 1929; 9: 155-68.
- Ilarramendi AA, De Carli P. Radius decompression for treatment of Kienbock disease. Tech Hand Up Extrem Surg. 2003; 7: 110-3.
- Ilarramendi AA, Schulz C, De Carli P. The surgical treatment of Kienbock's disease by radius and ulna metaphyseal core decompression. J Hand Surg Am. 2001; 26: 252-60.
- Innes L, Strauch RJ. Systematic review of the treatment of Kienbock's disease in its early and late stages. J Hand Surg Am. 2010; 35: 713-7.e4.
- Irisarri C, Kalb K, Ribak S. Infantile and juvenile lunatomalacia. J Hand Surg Eur. 2010; 35: 544-8.
- Jorquera R, Azocar C. Update on the use of arthroscopy in Kienbock's disease management. Rev Iberoam Cirugia Mano. 2020; 48: 119-27.
- Jurado R. Nonbleeding clotting: the role of the coagulation system in inflammation. Infect Dis Clin Pract. 2001; 10: 415-21.
- Kienbock R. Concerning traumatic malacia of the lunate and its consequences: joint degeneration and compression. Fortsch Geb Roentgenstr. 1910; 16: 77-103.
- Kolovich GP, Kalu CMK, Ruff ME. Current trends in treatment of Kienbock disease: a survey of hand surgeons. Hand. 2016; 11: 113-8.
- Kristensen SS, Thomassen E, Christensen F. Ulnar variance in Kienbock's disease. J Hand Surg Am. 1986; 11: 258-60.
- Lichtman DM, Bain GI. Kienbock's disease. Cham, Springer International Publishing, 2016.
- Lichtman DM, Lesley N, Simmons S. The classification and treatment of Kienbock's disease: the state of the art and a look at the future. J Hand Surg Eur. 2010; 35: 549-54.
- Lichtman DM, Mack GR, MacDonald R, Gunther S, Wilson J. Kienbock's disease: the role of silicone replacement arthroplasty. J Bone Joint Surg Am. 1977; 59: 899-908.
- Lichtman DM, Pientka WF, Bain GI. Kienbock disease: a new algorithm for the 21st century. J Wrist Surg. 2017; 6: e1-2.
- Lluch A, García-Elias M. Etiology of Kienbock disease. Tech Hand Up Extrem Surg. 2011; 15: 33-7.
- MacLean SBM, Kantar K, Bain GI, Lichtman DM. The role of wrist arthroscopy in Kienbock disease. Hand Clin. 2017; 33: 727-34.
- Mathoulin C, Wahegaonkar AL. Revascularization of the lunate by a volar vascularized bone graft and osteotomy OS the radius in treatment of Kienbock's disease. Microsurgery. 2009; 29: 373-8.
- Menth-Chiari WA, Phoelung GG, Wiesler ER, Ruch DS. Arthroscopic debridement for the treatment of Kienbock's disease. J Bone Jt Surg Am. 1999; 15: 12-9.
- Mirabello SC, Rosenthal DI, Smith RJ. Correlation of clinical and radiographic findings in Kienbock's disease. J Hand Surg Am. 1987; 12: 1049-54.
- Moran SL, Cooney WP, Berger RA, Bishop AT, Shin AY. The use of the 4+5 extensor compartmental vascularized bone graft for the treatment of Kienbock's disease. J Hand Surg Am. 2005; 30: 50-8.
- Müller W. Über die Erweichung und Verdichtung des Os lunatum, eine typische Erkrankung des Handgelenks. Beitr z Klin Chir. 1920; 119: 664.
- Okubo H, Futenma C, Sunagawa H, Kinjo M, Kanaya F. Very distal radius wedge osteotomy for Kienbock's disease: case series. J Hand Surg Asian-Pacific. 2017; 22: 490-6.
- Pegoli L, Ghezzi A, Cavalli E, Luchetti R, Pajardi G. Arthroscopic assisted bone grafting for early stages of Kienbock's disease. Hand Surg. 2011; 16: 127-31.
- Peltier LF. The classic. Concerning traumatic malacia of the lunate and its consequences: degeneration and compression fractures. Clin Orthop Relat Res. 1980; 149: 4-8.
- Quenzer DE, Dobyns JH, Linscheid RL, Trail IA, Vidal MA. Radial recession osteotomy for Kienbock's disease. J Hand Surg Am. 1997; 22: 386-95.
- Rabarin F, Saint Cast Y, Cesari B, Raimbeau G, Fouque PA. L'osteotomie du capitulum dans la maladie de Kienbock. Resultats cliniques et radiologiques à cinq ans de recul moyen. À propos de 12 cas. Chir Main. 2010; 29: 67-71.
- Razemon J. La radiologie de la maladie de Kienbock [Kienbock's disease radiology]. Ann Radiol. 1982; 25: 353-8.
- Rhee PC, Jones DB, Moran SL, Shin AY. The effect of lunate morphology in Kienbock disease. J Hand Surg Am. 2015; 40: 738-44.
- Saffar P, Gentaz R. Comparaison entre le traitement médical et chirurgical de la maladie de Kienbock. Ann Chir La Main Du Memb Supérieur. 1982; 1: 250-2.
- Schiltenswolf M, Martini AK, Mau HCh, et al. Further investigations of the intraosseous pressure characteristics in necrotic lunates [Kienbock's disease]. J Hand Surg. 1996; 21A: 754-8.
- Schmitt R, Kalb KH, Christopoulos G, Grunz JP. Osteonecrosis of the Upper Extremity: MRI-Based Zonal Patterns and Differential Diagnosis. Semin Musculoskelet Radiol. 2019; 23: 523-33.
- Taniguchi Y, Yoshida M, Iwasaki H, Otakara H, Iwata S. Kienbock's Disease in Elderly. J Hand Surg Am. 2003; 28A: 779-83.
- Trueta J. Treatment of war fractures by the closed method. Br Med J. 1939; 2: 1073-7.
- Tsantes AG, Papadopoulos DV, Gelalis ID, Vekris MD, Pakes EE, Korompilas AV. The efficacy of vascularized bone grafts in the treatment of scaphoid nonunions and Kienbock disease: a systematic review in 917 patients. J Hand Microsurg. 2019; 11: 6-13.
- Tsuge S, Nakamura R. Anatomical risk factors for Kienbock's disease. J Hand Surg Br. 1993; 18: 70-5.
- van Leeuwen WF, Janssen SJ, ter Meulen DP, Ring D. What is the radiographic prevalence of incidental Kienbock disease? Clin Orthop Relat Res. 2016a; 474: 808-13.
- van Leeuwen WF, Oflazoglu K, Menendez ME, Ring D. Negative ulnar variance and Kienbock disease. J Hand Surg Am. 2016b; 41: 214-8.
- Viegas SF, Wagner K, Patterson R, Peterson P. Medial [hamate] facet of the lunate. J Hand Surg Am. 1990; 15: 564-71.
- Viljakka T, Tallroth K, Vastamaki M. Long-term outcome [20 to 33 years] of radial shortening osteotomy for Kienbock's lunatomalacia. J Hand Surg Eur. 2014; 39: 761-9.
- Watanabe K, Nakamura R, Imaeda T. Assessment of Kienbock's disease. 1995; 11: 257-62.

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HAND-INJURY CARE FOR ALL:

Strategic steps towards universal Hand Therapy coverage

Are hand therapy services available to all?

In South Africa, as in many parts of the world, access to specialist hand therapy services is not an option for the majority of the population. Hand-injured patients, dependent on their hands for their livelihood, rely on services delivered by generalist therapists who typically work in complex rural, remote or underserved practice settings, with few resources, little or no supervision, and minimal support.

How do we strengthen the capacity of generalist therapists?

The role of specialist hand therapists will remain a critical one. However, if we are to pursue a vision of quality hand therapy for all, it becomes essential to consider how the capacity of generalist therapists may be strengthened to extend access to basic hand-injury care services. We sought to tackle this question collaboratively in South Africa through a hybrid consensus development conference (CDC) supported by the University of the Witwatersrand and the South African Society of Hand Therapists (SASHT).

The Conference: considering the evidence

A call for abstracts for the conference was circulated in late 2022. Twenty-nine presentations were included in the hybrid conference held in Pretoria, South Africa on Friday, 24 February 2023. Evidence presented by local and international colleagues covered the practice realities and experiences of generalist therapists, the perspectives of service-users, relevant assessment and treatment practices, strategies for capacity strengthening, policy perspectives and practice innovation. A practice



The hybrid Conference was held at the CSIR Convention Centre in Pretoria, South Africa.

innovation that was well received was a mobile hand therapy station (Hand Therapy on the move) that has been piloted in two rural settings in South Africa. The backpack kit contains all basic splinting equipment and supplies, and occupation-based rehabilitation resources. The plan is for the kit to be placed on state tender to enable therapists to easily procure the resource. The design and construction of the kit will be shared via publication to enable the practice innovation to be replicated in other LMICs.



The mobile hand therapy station that can be pulled on wheels or carried on your back

A panel of fourteen stakeholders was invited to the conference to consider the evidence and establish consensus on what is needed to strengthen hand therapy services and the capacity of generalist therapists for this. The stakeholders represented: generalist occupational therapists working in rural and urban settings (Adri Cronje, Keri Collinson, Lauren Lubbe and Bibi Fatima Loonat), physiotherapy (Joanne Wylie), SASHT (Elani Muller), the South African Society for Surgery of the Hand (Dr Antoine Rocher), service users (Tshepiso Kolomote and Hena Dajee), the National Occupational Therapy Forum (Rogini Pillay), the Occupational Therapy Association of South Africa (Anisha Ramlual), Occupational Therapy Education (DrThuli Mthembu), Research (Dr Hester van Biljon) and the Department of Health (Thabani Ncwane).

Conference attendees were able to share their perspectives on the evidence presented on post-it notes (in-person attendees) and via the Zoom chat (online attendees). The stakeholders considered these impressions before embarking on the consensus development process. Key themes that emerged from these contributions was accessible information and learning resources; the need for mentorship, Communities of Practice and networks; and the role of undergraduate education.



Stakeholders review attendee perspectives prior to following the consensus development process.

Developing consensus: using a nominal group technique

The consensus development process took place on Saturday 25 February 2023 using a nominal group technique. The key question posed to the group was: What is needed to make quality hand therapy happen in public services?

The first step of the process involved generating ideas in response to this question and the evidence presented at the conference. Each stakeholder silently and independently recorded his or her ideas on cards. In the second step, ideas were shared and recorded in a round-robin format until all ideas (167 in total) had been exhausted.

Step 3, discussing ideas involved clarifying each idea and collectively sorting these into categories. The ideas were clustered into ten categories.

Voting on ideas, the final step of the NGT, was completed using interactive presentation software (www.mentimeter.com).



Step 1: Stakeholders generate ideas independently



Step 2 & 3: All ideas were shared and recorded, after which ideas were discussed and collectively categorized

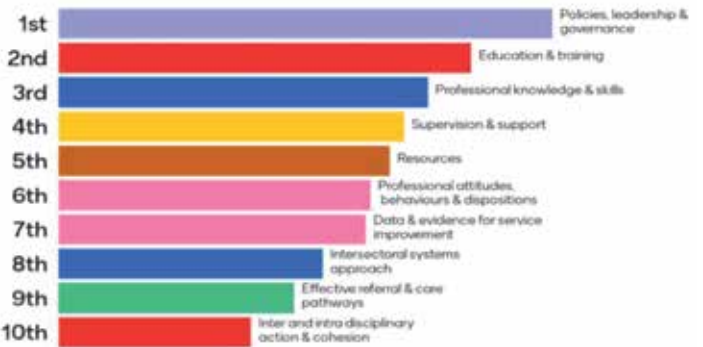


Figure 1: Consensus on priority areas for action to enable quality hand therapy in the South African public service voted by stakeholders (n=14)

Each stakeholder ranked the ten categories that they considered most important for the delivery of quality hand therapy. Figure 1 illustrates the result: the top five priorities were policies, leadership and governance, education and training, professional knowledge & skills, supervision and support, and resources. The specific areas for intervention within each of the ten categories is undergoing further analysis and will be shared via journal publication.

One small step towards universal hand therapy coverage: where to from here?

The CDC has been instrumental in highlighting the needs of generalist occupational therapists for delivering hand therapy as well as identifying prioritized areas for action. But the hard work lies ahead: opportunities to leverage international partnerships should be explored to extend the impact of this project beyond the South African context. Quality hand therapy for all is an ambitious vision but one that invites us to pool our expertise and resources to extend hand therapy to the populations that need it the most. The production of high-quality open access educational content for generalist therapists may be one strategic way that we can work towards this vision.



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IFSHT NEWSLETTER - REACH VOLUME 3, NO. 1

UPCOMING EVENTS



At the time of writing the first issue of volume 3 of the IFSHT newsletter is being prepared! Please check out the following link to access it: https://ifsht.org/publications/?publications_category=29 The publication aims to collate Research, Education, Achievement and Clinicians in Hand and upper limb therapy around the world.

This edition of REACH will introduce a new segment for therapists on how to write and publish research. It also continues to present to you snapshot of recent research pertinent to hand therapy and also a new feature, “...on the horizon”, about ongoing research which will inform practice in the near future.

The issue will feature new clinical pearls and the Spotlight On! Section will feature the Hand Therapists Society of Türkiye and, we also continue our new “Volunteer” section. It will also feature a further two recipients of the prestigious IFSHT Lifetime Achievement Awards in a new interview format. The recipients were Sarah Ewald and Suzanne Caragianis. We call on hand and upper limb therapy clinicians and researchers to submit any contributions for consideration to: informationofficer@ifsht.org



Just around the corner the FESSH-EFSHT 2023 Congress is being held from 10th -13th May 2023 in Rimini, Italy. Please follow the link for more details: <https://fessh-efsht2023.com/>



On 6th to 7th October 2023, the British Association of Hand Therapists will hold their annual conference in Bournemouth. Event details at: <https://www.eventbrite.co.uk/e/baht-conference-bournemouth-2023-tickets-576111564197>

PULPe Webinar (November 2022): Madelung deformity

Madelung deformity is a challenging condition to treat as many aspects related to it are still unclear. The Paediatric Upper Limb Project Europe (PULPe) held a webinar on Madelung deformity in November 2022. The moderators were Wiebke Hülsemann (Germany) and Mona Winge (Norway).

The aims of our webinar were a presentation of current knowledge and a discussion related to many important details on this subject.

Our invited international experts gave the following talks

- What is Madelung deformity - Sebastian Farr, Austria
- Treatment of the immature patient - Dan Zlotolow, USA
- Treatment of the mature Madelung patient (2D versus 3D) - Manon Bachy, France
- The use of PROMs in the follow-up - Abbas Peymani, Netherlands

The Madelung deformity webinar is available for members (free) on PULPe's website <https://pulpe.eu>

What is Madelung deformity? - Sebastian Farr

Madelung deformity is a premature partial closure of the ulnar volar part of the distal radial physis. It is an uncommon condition. During our webinar we noted that "only" an average of 2-8 new Madelung patients

are referred to our 6 authors' clinics per year. (Figure 1)



Figure 1. Young patient with Madelung deformity

Q: What is the etiology?

Many things remain unclear to date. However, we know that a genetic cause exists. The congenital Madelung deformity is associated with a mutation/deletion of the short stature homeobox (SHOX) gene in the pseudoautosomal area of the sex chromosome. A SHOX-deficit is found in patients with Leri-Weill dyschondrosteosis and Turner patients.¹ These syndromes are associated with Madelung deformity, are often bilateral, and referred to as a classic Madelung deformity. We however do know that unilateral, non-syndromic cases exist as well. These phenotypes are usually not as severe. Moreover, there are types referred to as the "Madelung-like" deformities due to trauma or infection. A current belief is that Madelung deformity presents with a Vickers ligament, which is largely involved in the pathogenesis. (Figure 2)



Figure 2. MRI wrist of a Madelung deformity with a Vickers ligament (arrow)

Q: What is the incidence?

The incidence is reported as < 2% of all congenital hand deformities. Flatt found an incidence of 1.7% in a series of 1400 patients in 1977.² There is a predominantly female distribution (4:1).

Q: Do you believe that patients with a "syndromic" Madelung deformity have a bilateral deformity?

Most patients with a genetic cause will present with bilateral deformities but not necessarily symmetrical differences. The phenotypical presentation can vary within a patient but also within a SHOX family.

Q: Do you believe that the Vickers ligament is present in all Madelung patients?

The authors respond differently depending on their own experience. A multi-centre study noted that the Vickers ligament was intra-operatively verified in 83% of cases in 75 wrists.³ It was more often found in syndromic (91%) and bilateral (84%) cases, respectively.

Q Which Madelung deformity types have been described?

There are 3 radiological types called the distal, entire and the reverse type.^{3,4}

Q: Do you refer your patients to a geneticist and/or a paediatric endocrinologist?

The authors have different routines in their practices, where half (3/6) routinely refer to a geneticist and one (1/6) to a paediatric endocrinologist. We agree that a genetic assessment is recommended for the bilateral cases, in patients with short stature, and will be helpful in cases of younger siblings not aware of a possible genetic diagnosis.

Q Do you screen siblings of affected patients?

Yes, this is done whenever possible. Madelung deformity patients are often referred too late for their first consultation and are too old for prophylactic surgery. We recommend the inclusion of a family history to possibly identify younger siblings and obtain radiographs of both their wrists if an appropriate age (i.e. 5 years) has been reached. Different routines exist among the involved institutions regarding genetic counselling. Some suggest referral of all Madelung patients with short stature, a presumed syndromic affection and/or bilateral Madelung deformity and some suggest also referral of the younger siblings. Should a SHOX mutation be found in a young sibling, regular radiographic follow-up is suggested until definite Madelung deformity can be established. Genetic counselling could help determine which children need a closer follow-up.

Q: Which radiological measurement thresholds have been published for the diagnosis of Madelung deformity?

McCarroll introduced the following measurements to aid in the prediction of Madelung deformity diagnosis: ulnar tilt of $\geq 33^\circ$, lunate subsidence of ≥ 4 mm, lunate fossa angle of $\geq 40^\circ$ and palmar carpal

displacement of ≥ 20 mm.⁵

The measurement ulnar variance ≥ 5 mm was added as a radiographic criteria to help predict which patients might need an ulnar shortening osteotomy.⁶ (Figure 3a-b)



Figure 3a. Madelung deformity distal radius type.
b. Madelung deformity entire radius type

Treatment of the immature patients - Dan Zlotolow

Q: What do you include in the pre-operative radiological assessment of an immature patient?
X-ray - CT scan- MRI?

This is done differently by the authors. We recommend x-rays of wrists and forearms of Madelung patients and for the screening of siblings. The radiographs will distinguish the milder distal type from the entire radius type deformity. If there is any sign of deformity in any of the siblings, an MRI can identify the Vickers ligament. A CT scan is preferred in the post-traumatic cases in one centre and for all Madelung cases in another.

A CT scan can more easily identify the open physes in the immature patient. These are difficult to visualise in the older immature patient. We suggest using the imaging which best demonstrates the structures to be identified.⁷

Q: Which part of the prophylactic surgery is more important to do? Is it the Vickers ligament release, the physiolysis, or both?

We believe a Vickers ligament release combined with a physiolysis is necessary for an optimal result.⁸

The result is dependent on the patient's age and on the growth potential of the physis. An initial insult results from the Vickers ligament compressing down on the physis. The physis has most probably been impacted from a young age and a Vickers ligament release alone will likely not be sufficient. A physiolysis will therefore also need to be done.

Q: What are the surgical criteria for an intervention in immature children? How early can you plan prophylactic surgery in the immature patients? Is there an age limit for prophylactic surgery?

No current data exists on the recommendations for prophylactic treatment. The indications for prophylactic surgery in the immature Madelung patient are open physes with an expected remaining growth in the distal radius.⁹

A patient can variably experience no symptoms to some aching pain in the wrist and restrictive rotational motion. The Vickers ligament must be visible to be released. At 6-8 years of age, the Vickers ligament is thin, narrow and nearly transparent. During the child's growth this changes gradually to a 5-10 mm solid broad structure. The age limit of ligament release depends on the time of physeal closure.

Q: Have you experienced that the older immature children with pre-operative pain report pain relief after prophylactic surgery?

Yes, we have experienced this, often at the follow-up.

Q: Have you seen visible clinical correction of alignment after prophylaxis treatment in the immature patient? Can you expect radiological correction?

Most of the authors have no personal experience of this. One author however can report that this has happened in a couple of patients with entire radius type. The patient and parents have returned to clinic after surgery describing a straighter arm and relief of pain.

Q: Why do prophylactic surgery when a child has no pain, no symptoms? What are the expected results of prophylactic surgery? Can you expect radiological correction?

A prophylactic surgery will hopefully limit the (further) development of a more severe Madelung deformity with a main aim to also limit associated functional limitation and pain. A child can manage well with mild symptoms, not needing any further surgical correction. We note that these are not necessarily directly associated with the severity of the deformity.

We recommend doing prophylactic surgery in immature patients, even in asymptomatic cases. This surgery is uncomplicated to perform, unlike corrective osteotomy surgeries in symptomatic mature cases which are regularly more complex and unreliable.

Q Which procedure would you suggest be included in the prophylactic surgery for children between 10-14 years?

For older and adolescent age children, a ligament release and physiolysis are indicated when the deformity is mild and there is a possibility of detethering of a viable physis. We do not add any other procedures if we believe the radius has additional growth potential, unless the ulnar overgrowth exceeds the expected future growth of the radius.⁶

If the distal radial physis is partially closed, we will forgo prophylactic surgery and move to deformity correction with osteotomy.

Treatment of the mature patients - (2D versus 3D) - Manon Bachy

The mature patient has closed physes.

Q: What is the primary indication for surgery in mature patients? Pain, severely reduced motion or/and cosmesis?

The authors answer this question differently. We agree that pain is an indication for surgery in the mature patient.

Severely reduced motion can also be an indication for surgery with good results found in the literature.¹⁰ The isolated cosmesis indication is not generally accepted and only one author would consider this in selected patients.

Q: Is the distal type of Madelung deformity more affected by pain than the entire type?

It might seem as if the distal type is more affected than the entire type. We are not aware of current data on this subject. A differentiation between these two entities will be an important point in future studies to refine the analysis of the results.

Q: Do you always expect pain reduction after corrective osteotomy?

The authors have different experiences and answer both yes and no to this question. In mature patients with ulno-carpal impingement pain, an improvement of the pain is expected from an early postoperative stage. There is some uncertainty however as to how long this period will last.

An unknown factor is whether a reduction of a longstanding distal radio-ulnar joint (DRUJ) dislocation is appropriate, as little or no possibility of remodeling is expected. Long-term retrospective studies of adult patients operated as adolescent mature patients would be helpful to refine these answers.

Q: What is a realistic expected outcome after surgery in mature patients?

This question is difficult to answer because surgical results are dependent on many factors such as the patient, the severity of the Madelung deformity at different levels and type of surgery. A French multicentre retrospective study found that in a group of 12-17 year-old patients, a distal radius osteotomy combined with an ulnar shortening gave very satisfactory esthetic results and mostly good to excellent functional results.¹⁰ The assessment and treatment of Madelung patient must be individualised due to the wide spectrum seen in this congenital group.

Q: What is your preferred 2D corrective osteotomy technique? Dome osteotomy, opening wedge, closing wedge?

This depends on the age of the patient and severity of the deformity. The dome osteotomy of the distal radius is a good technique for correction of Madelung deformity in the younger patient.¹¹ The advantages of a dome osteotomy are the preservation of length allowing multiplanar correction, but without the possibility of increasing radial length. It has good to excellent short-term clinical and radiographic results.¹² In the older patient, an opening wedge osteotomy is more often used to limit the shortening of an already shortened forearm. In contrast, the closing wedge osteotomy is more rarely used. In the advanced cases, a radial correction alone may be insufficient independent of the type of radial osteotomy performed. An ulnar shortening is required to “rebalance” the wrist.⁶

Q Which different indications exist for 2D and 3D osteotomies?

Conventional two-dimensional (2D) radiographs are not able to appreciate the complexity of a three-dimensional (3D) deformity such as the flexion and rotational components of the severe Madelung deformity.

3D CT analyses allow a perfect understanding of the deformity demonstrating, in severe cases, the importance of visualising the AP and lateral view of both the diaphyseal and epiphyseal deformities. The surgical correction is challenging due to a need for multiplanar correction. A 2D corrective opening wedge osteotomy with ulnar tilt reduction is technically challenging especially during important moments of maintaining angular corrections during fluoroscopic control until plate fixation.

A computer-assisted planification (CAP) can help decide the osteotomy level, amount of correction and type of osteosynthesis. The Patient Specific Instrumentation (PSI) generates 3D-printed models and cutting guides and seems to make surgery easier, safer and faster than the 2D techniques.¹³ The preoperative 3D CT planning is a good tool for symptomatic severe Madelung deformities.

Use of Patient-Reported Outcome Measures (PROMs) in the follow-up - Abbas Peymani

Q: Do you use PROMs in your clinic to assess Madelung patients?

Three of the authors use PROMs routinely in the follow-up of Madelung patients in their clinic whereas a fourth uses PROMs for specific congenital diagnoses (i.e. radial longitudinal deficiency, ulnar longitudinal deficiency, symbrachydactyly etc).

The introduction of PROMs in clinical practice is recommended to increase our understanding of this rare condition and its impact on patients' lives, to assess treatment efficiency by comparing pre- and post-operative measurements, and to allow comparisons between different treatment options.

Q: Abbas Peymani's social media study included several patient outcomes to assess Madelung deformity looking at physical, mental and social health. Is this important in the follow-up of patients?

Did you experience any specific lack of reporting from participants on the PROMIS forms regarding anxiety, depression and social health?

It has been well established that congenital hand conditions have a profound impact on various aspects of patients' lives.¹⁴ Given the rarity of Madelung and our limited insights into the patient perspective, it could be beneficial to collect data on multiple domains including mental and social health in addition to merely physical health. This would help us better understand the patient sitting across from us.

In our social media study, participants were not able to submit an entry without a full completion of the PROMIS forms.

Q: You found a significant difference between the operated and non-operated children for pain interference. There was no significant difference in the PROMIS scores for operated adult patients and non-operated adult patients (pain intensity- pain interference, upper extremity function, depression, peer relationships). Can you explain this?

While this social media study is the largest study on Madelung deformity outcomes, it has certain limitations such as self-reporting bias. We should therefore be careful to draw strong clinical conclusions, as the included number of children was small (n=17) and the statistical significance in pain interference (P=0.045) was borderline.

That said, it does seem that a considerable proportion of adult patients experience pain and discomfort after surgery. The anatomical configurations of Madelung deformity present on a wide spectrum³ and some cases might require alternative surgical treatment options.

Q: Do you suggest management of pain to mature patients? How can patients best reduce pain interference during daily activities?

An important first step for all patients is to understand what Madelung deformity is. In many patients, the diagnosis and symptoms do not need to limit the patient's activities but it might be necessary to consider activity modification. In many cases a soft splint can be helpful either during a specific activity or at rest (after school or work).

Q: What is the estimated percentage of adult Madelung patients using daily analgesics?

Nearly half (49%) of adult patients reported analgesic use on a regular basis. This is not surprising as both unoperated and operated patients experience pain with significant consequences on their daily functioning.

Q: On a scale from 0 (no pain) to 10 (worst imaginable pain) what is the average estimate of pain intensity levels in adult Madelung patients that have undergone surgery?

Adult patients after surgery reported PROMIS pain intensity levels of 5.0 ± 2.9 (0 = no pain, 10 = worst imaginable pain).

Take-home message:

- Prophylactic surgery in the immature patients as early as possible.
- Early screening of siblings.
- Corrective osteotomy in the mature patient only if pain and/or severely reduced motion
- Pain management to reduce pain interference permitting participation during daily activities
- Include PROMs for the assessment and follow-up of Madelung deformity patients

References:

1. Kurnaz E, Savaş-Erdeve Ş, Çetinkaya S, Aycan Z. SHOX gene deletion screening by FISH in children with short stature and Madelung deformity and their characteristics. *J Pediatr Endocrinol Metab.* Nov 27 2018;31(11):1273-1278. doi:10.1515/jpem-2018-0038
2. Flatt AE. The congenital hand anomalies. 1977:50.
3. Zebala LP, Manske PR, Goldfarb CA. Madelung's deformity: a spectrum of presentation. *J Hand Surg Am.* Nov 2007;32(9):1393-401. doi:10.1016/j.jhsa.2007.08.012
4. Rajput R, Bhat RV, Bhansali A. Reverse Madelung deformity. *J Assoc Physicians India.* Feb 2005;53:120.
5. McCarroll HR, Jr., James MA, Newmeyer WL, 3rd, Manske PR. Madelung's deformity: diagnostic thresholds of radiographic measurements. *J Hand Surg Am.* May 2010;35(5):807-12. doi:10.1016/j.jhsa.2010.02.003
6. Farr S, Kalish LA, Bae DS, Waters PM. Radiographic Criteria for Undergoing an Ulnar Shortening Osteotomy in Madelung Deformity: A Long-term Experience From a Single Institution. *J Pediatr Orthop.* Apr-May 2016;36(3):310-5. doi:10.1097/bpo.0000000000000434
7. Ali S, Kaplan S, Kaufman T, Fenerty S, Kozin S, Zlotolow DA. Madelung deformity and Madelung-type deformities: a review of the clinical and radiological characteristics. *Pediatr Radiol.* Nov 2015;45(12):1856-63. doi:10.1007/s00247-015-3390-0
8. Vickers D, Nielsen G. Madelung deformity: surgical prophylaxis (physiolysis) during the late growth period by resection of the dyschondrosteosis lesion. *J Hand Surg Br.* Aug 1992;17(4):401-7.
9. Kozin SH, Zlotolow DA. Madelung Deformity. *J Hand Surg Am.* Oct 2015;40(10):2090-8. doi:10.1016/j.jhsa.2015.03.033
10. Bebing M, de Courtivron B, Pannier S, et al. Madelung's deformity in children: Clinical and radiological results from a French national multicentre retrospective study. *Orthop Traumatol Surg Res.* Nov 2020;106(7):1339-1343. doi:10.1016/j.otsr.2020.03.036
11. Harley BJ, Brown C, Cummings K, Carter PR, Ezaki M. Volar ligament release and distal radius dome osteotomy for correction of Madelung's deformity. *J Hand Surg Am.* Nov 2006;31(9):1499-506. doi:10.1016/j.jhsa.2006.07.012
12. Steinman S, Oishi S, Mills J, Bush P, Wheeler L, Ezaki M. Volar ligament release and distal radial dome osteotomy for the correction of Madelung deformity: long-term follow-up. *J Bone Joint Surg Am.* Jul 3 2013;95(13):1198-204. doi:10.2106/jbjs.l.00714
13. Benayoun M, Langlais T, Laurent R, et al. 3D planning and patient-specific surgical guides in forearm osteotomy in children: Radiographic accuracy and clinical morbidity. *Orthop Traumatol Surg Res.* Oct 2022;108(6):102925. doi:10.1016/j.otsr.2021.102925
14. Bae DS, Canizares MF, Miller PE, Waters PM, Goldfarb CA. Functional Impact of Congenital Hand Differences: Early Results From the Congenital Upper Limb Differences (CoULD) Registry. *J Hand Surg Am.* Apr 2018;43(4):321-330. doi:10.1016/j.jhsa.2017.10.006

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Managing Failure

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Editorial

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Managing Failure

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Failure is the state when a desirable, or intended, objective is not met and is the opposite of success. When anyone talks or writes about failure it is always with the intention of avoiding it. It is obviously relative, can be biased based on the individual considering it, and depends considerably on the context in which it is used. It is difficult to define, but everyone understands what it is and recognises it when it happens. It is interesting to discuss it from the simplest situations of failure in surgery to the larger issue of failure of institutions.

Failure of Surgical Procedures: Of all instances of failure in medicine, this, arguably, is the easiest to remedy. I remember one of my mentors, Dr Ravikumar, a Paediatric Surgeon, telling me while discussing a surgical failure, *'It is impossible for you to be the first one in the world to have met this problem during surgery. Many would have faced it, quite a few would have found successful solutions and at least some would have written about it. It is just that you need to read'*. When faced with a surgical failure or complication, one needs to sit back and think about why it happened, discuss the problem openly with peers and delve further into the literature.

How do I personally avoid surgical failures? Two practices have helped me – First is Bob Acland's dictum – *'Preparation is the key to success. Before you start you must have done the procedure a few times in your mind'*. Second, whenever you have to do a procedure which you have not done in the last 6 months, it is always worthwhile to read the steps or watch a video. This might appear to be superfluous advice, but nothing makes you more comfortable than the confidence of knowing that everything is well set for success, and knowing what you are in for when you pick up the knife. Commonly, we analyse our failures, but it is as important, and useful, for us to analyse

our successes, the steps which led to the success and how to achieve it consistently.

It is also important to keep the memory of a failure very short. If we have a replant failure, we look for the earliest opportunity to do the next replant and succeed. There is an old tradition in the Air Force of the entire station flying immediately after an unfortunate crash. This is to boost the morale of a well-trained team and inspire confidence in the machine, after a rare and unfortunate failure of a routine procedure. Most of the time, it is led by the commanding officer himself, indicating that while the Squadron grieves for the departed comrade, life must go on and the Squadron must get back to the assigned task.

Failures during Training: Often we hear from people at the end of the training that they felt the lack of good teachers. It is wonderful if an eager student meets with an ideal mentor. Is there a shortage of mentors? With an experience of over 35 years in teaching, I have come to believe in what Gautama Buddha said 2,500 years ago that *'When the student is ready the teacher will appear'*. The saying also means that when we are ready to learn and grow, we will be ready to listen to and act upon knowledge we glean from the teacher who is already in front of us, and perhaps has always been there; only we were previously un-receptive to their offerings. I am convinced that there will always be someone who will spot and nurture a good student. A corollary of this quote, attributed to the Chinese philosopher Lao Tzu, that *'When the student is truly ready, the teacher disappears'* is also true.

Failure to Thrive in Practice: An individual may sometimes become frustrated when he misses a job, or a promotion, which he rightfully deserves. It may seem as if people or the whole world is conspiring against him. This will happen sometime or other in everyone's life. At that time, the first response of the individual is seething anger all around. This must be contained, since exhibiting it may lead to even more problems. It will be good if, at such a time of dismay, frustration and anger, there is a mentor to talk with, who can put things into perspective and guide us on the way forward. The need of the hour is the ability to see the bigger picture. At one such point of time in my

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career, I had the fortune of having Dr Lalita Kameswaran, the former Vice Chancellor of The Tamil Nadu Dr. M.G.R. Medical University, Chennai, as a mentor who assessed the situation and said, *'Sabapathy, you are full of anger. Anger is a very powerful emotion. It must be constructively channelled, otherwise you will end up hurting yourself and your career. Put the thought of this issue aside and use the anger to work a little harder, at least half an hour extra every day. Most importantly, remember that what appears to be so important today, you will find to be totally irrelevant in the course of time. Any damage from a response to your anger now is likely to be to yourself. Just forget the past and get back to work'*. That was a great piece of advice. Looking back, the issue which had me so fired up soon became irrelevant. This event also helped me learn the importance of looking at the bigger picture.

Starting, nurturing and thriving in practice needs a combination of professional skills, love for the job and positioning your skills in the right way and place, such that the needy may benefit from said skills. Currently, practising medicine has become a team game, and one must be a good team player. Even when all the desirable attributes are present, sometimes success eludes an individual. At that time, perhaps what is needed is to stay confident and to keep working without going off the track. Slackening the tempo of work, disregarding your values and underperforming due to self-pity can creep up slowly, leading you down a negative spiral.

Cricket legend Sachin Tendulkar scored his ninety-ninth century on 12 March 2011. After that, in every innings he played, he sought his hundredth hundred, and his fans worldwide were waiting to celebrate. But it took the champion batsman 370 days and 34 innings to create that history. On 16 March 2012, he scored that elusive hundredth century in Dhaka against Bangladesh. If the man revered as the 'God of Cricket', had to wait 34 innings to achieve his goal, we cannot expect a cakewalk in our endeavours.

Failure of Institutions: Individuals make institutions and when institutions fail it is because many individuals have collectively failed. Most surgical units peak and gradually slide downwards again. Rarely have we found them to survive at the same level of recognition beyond a few decades. Most have been created by a visionary whose ideas, skills and leadership qualities made the unit popular and productive.

However, decline is not inevitable. When Bob Acland visited our unit, he wrote in our visitor's book about this and wished us *'continued success'*. This underlines the fact that continued success is neither automatic nor should be considered as an entitlement. It requires hard

work. On further discussion, I enquired as to what he saw were the main reasons for the rise and fall of institutions. It is worth recalling the three points that he listed. The first was, *'Celebrating Success'*. While success needs to be celebrated, the founders and the next generation must understand that it is so easy to keep on explaining how the unit succeeded and fail to continue to put in the same groundwork in the unit. Second, *'You may be training the world, and forget to train the people who will take over from you'*. Identifying, nurturing and stabilising the next generation of surgeon leaders who will take over is a big challenge in itself. When that happens, units survive. The third was *'Forgetting the core which brought you up to this level of success in the first place'*. Perhaps the slide starts when people forget this. The core is good patient care. All units which have risen to a height have considered this a non-negotiable goal. Institutions fail when people who take over try to explain the loss of that value as inevitable, due to changing times and practices. Technology may help us to achieve our goals by a different path but the core value of patient satisfaction and putting the interest of the patient first and foremost must not change. History has shown that whenever that has happened, and physicians put their own interests first, and before those of the patients, even the most famous units faltered.

It all starts at the individual level, with small compromises by a few people that go unchecked. Not that these small, out of order, practices are not recognised by the people around—the tragedy is that many chose to remain silent and allow this to happen. At first, the defaults are all 'small', but many such, seemingly small, aberrations in practice add up and the system is derailed irrevocably. President Kennedy was fond of quoting Dante that *'the hottest places in Hell are reserved for those who, in a time of great moral crisis, maintain their neutrality'*. None of us can afford to be lookers-on, critics on the sidelines. One need not wait for occasions of great moral crisis to exhibit the courage of standing up. It has to be done the first time someone misses a 'routine' postoperative round or justifies an unacceptable mistake.

Failures are bound to occur, but it is the response that counts. At an individual level, what is needed is to stop and think what caused it, then correct the failing and keep going. This way, we stay right on the job. At an institutional level, it is the unwillingness of leadership to correct 'small' compromises, to grasp the opportunity to act, that allows a new norm, and allows the slide to start. At all times, we need people who will stand up if the core values are to be kept afloat. A single person alone can do this. As Andrew Jackson said, *'One man with courage makes a majority'*. Such people delay the failure of institutions indefinitely.

Art Exhibit #17



Title: L'Eloge de la caresse "In praise of the Caress"
Artist: George Jeanclos
1991. width 28cm ; height 30 cm

Acknowledgement: We thank the Editor and Publisher for allowing the IFSSH Ezine to re-publish this Editorial.

Member Society

ITALIAN SOCIETY FOR SURGERY OF THE HAND (SICM)

The organization of scientific events in Italy was subject to continuous Covid-19 social distancing restrictions until March 2022.

The end of restrictions was marked by the participation of SICM, as Guest Society of the ILA (Ibero-Latin-American) Group Congress, held in Maceió, Brazil on 23-26 March 2022. Thanks to the great effort of the Brazilian organizers (Raimundo Araujo Filho and Ricardo Kaempf), the SICM delegation could attend all 3 days of the meeting, contributing to several round tables and free papers sessions.

The significant shift towards hybrid mode in the organization of scientific events is a 'precious token' that the pandemic has left us. Under the patronage of SICM, several local meetings have been transformed into webinars and many congresses and courses are also held in hybrid mode, thus reducing expenses and facilitating participant attendance.

At the beginning of the year, SICM celebrated the foundation of the new "SICM Young" group, proposed by Matteo Guzzini and Letizia Marengi, with the aim of promoting educational events specifically suited to the needs of young SICM members. The SICM Young educational program began with a webinar series organized in collaboration with the SICM Study Group for Wrist Disorders and attracted a large attendance, including numerous orthopedic and plastic trainees.

SICM contributed to the IFSSH/FESSH Combined Congress in London with 14 invited talks, 34 podium presentations and 17 e-posters covering a broad spectrum of scientific topics. A large delegation of Italian hand surgeons and therapists attended the

Congress, confirming the great interest and attitude of SICM towards international exchanges.

Currently, SICM is involved in the organisation of the next XXVIII FESSH & EFSHT Congress chaired by Riccardo Luchetti. The Congress will be hosted in the beautiful city of Rimini on 10-13 May 2023. (Fig. 1) The scientific program will cover current major topics in hand surgery: 'From Basic to Controversy'. We welcome the participation of hand surgeons and therapists from around the world with over 970 abstracts submitted and nearly 400 accepted as oral presentations. Information on the final program and registration are available on the Congress website: <https://fessh2023.com/>



Fig. 1: Welcome to the XXVIII FESSH & EFSHT Meeting. The event will take place in the "spaceship" venue Palacongressi of Rimini (Italy) from 10-13 May 2023.

At the end of 2022, it was finally possible to resume full in-person attendance at our Annual National Congress, hosted by Mario Cherubino in Varese, which also provided online broadcasting of the main sessions.



Fig. 2: Participants of the SICM Advanced Course: "Arthroplasty surgery: from fingers to elbow" with Massimo Corain, chairman of the Course.

The SICM Advanced Course this year was chaired by Massimo Corain and Augusto Marcuzzi. The topic was: "Arthroplasty surgery: from fingers to elbow". It involved a world-renowned international faculty and also gathered a large number of participants in the hands-on CadLab sessions (Fig. 2).

The year ended with an invitation to SICM as Guest Society of the 58th Annual Congress of the French Society for Surgery of the Hand GEM/SFCM. Several round table discussions of the highest scientific order were organized by Bruno Lussiez and Didier Fontes ((Fig. 3).

New projects are in the starting blocks for this year: on our website <https://www.sicm.it/it/corsi-congressi.html> you can find the details of the next Advanced Course: 'The scaphoid: advanced concepts, fake news and controversies in diagnosis and treatment', chaired by David Espen and Luciana Marzella, among others.

We welcome you to join us for the 61st SICM National Congress, chaired by Stefania Briano and Antonio Merello, in stunning Genoa on 19-22 October 2023.

Several international guests are invited to contribute to the interactive sessions which will focus on three main topics: 'High energy injuries from hand to elbow', 'Complications of surgical treatment' and 'Congenital hand deformities'.

Information on the final program and registration are available on the Congress website: <https://www.lcfcongress.com/eventi/61-congresso-nazionale-sicm-2023/>



Fig. 3: The Italian Delegation to the 58th Annual Congress of the French Society for Surgery of the Hand GEM/SFCM.

ISRAEL SOCIETY FOR SURGERY OF THE HAND

The Israeli Society for Surgery of the Hand held its first course on ultrasound of the wrist, hand and fingers on 24 January 2023. This was part of its 2-day annual winter meeting held in Tel Aviv. The course was led by Prof. Esther Vögelin from Bern, Switzerland and included 5 Israeli radiologists and instructors and 60 participants. The trainees were hand surgery fellows and surgeons of all ages.



According to Zumsteg et al., (2019) after a 30-minute instructional session, hand surgery fellows can achieve a basic level of competency in utilizing the ultrasound. Knowledge of the anatomy is key, but availability in the clinic and much practice, can make this a valuable tool in a hand surgeon's routine.

SHAI LURIA,

Zumsteg JW, Ina JG, Merrell GA. Evaluation of the acquisition of ultrasound proficiency in hand surgery fellows. Journal of ultrasound in medicine: official journal of the American Institute of Ultrasound in Medicine. 2019; 38: 2111-7.



SOUTH AFRICAN SOCIETY FOR SURGERY OF THE HAND (SASSH)

The IFSSH meeting in London last year was well attended by surgeons and therapists from South Africa. It was particularly good to attend an international meeting again, which were largely stopped over the last few years due to Covid. The meeting was hugely enjoyable and the programs for the therapists and the surgeons were very educational. The venue was convenient with ample accommodation nearby and easy access into London.



Fig. 1 Some of the South African surgeons and therapists who attended the IFSSH meeting

In September last year SASSH hosted its first Annual Scientific Congress in 3 years due to the Covid pandemic. It was held in Cape Town and was very well attended. We had international guest speakers from The Netherlands (Henk Coert and Paul Werker) and the UK (Dean Boyce) who were excellent and gave us some great talks. There were many high-level scientific papers presented at the meeting, and a great time was had by all.

SASSH also hosts a Refresher Course every year in February. This year the topic was "Tumours and Infections" and it was held in Johannesburg. These courses consist mostly of instructional course lectures, not scientific research papers, and are particularly

valuable for registrars and junior consultants. It also serves as a good recap for established hand surgeons, with reviews of the latest literature of particular topics.

Prior to this Refresher Course we ran the first microsurgery course in South Africa for many years. It was held at the Zeiss Laboratory in Johannesburg where all delegates trained using state of the art Zeiss microscopes. There were 21 delegates and the course was run by a combination of local and international faculty from the University of Wisconsin-Madison. The microsurgery was performed on Blue-Blood chicken thigh models which was developed by Weifeng Zeng. This is an excellent training model which allows one to assess one's competency of the microsurgical anastomosis. There was a very positive response to the course and it will likely become an annual event.



Fig. 2 Delegates at the Microsurgery Course

Our annual Scientific Congress will happen this year in September and will be in Cape Town again. Details are not finalised yet but we will likely be having a Flap Course run by Henk Giele before the Congress. Henk has visited us a few times and has previously run excellent cadaver flap courses.

We look forward to seeing and catching up with everyone again in Rimini, Italy, for the FESSH meeting in May, and in Toronto, Canada, for the ASSH meeting in October!

DUNCAN MCGUIRE
President: SASSH

TURKISH SOCIETY FOR SURGERY OF THE HAND AND UPPER EXTREMITY

Turkish Society for Surgery of the Hand and Upper Extremity was founded in 1977. We have 245 active members. Since 2009, our Society has established a Subspecialty Diploma in Hand and Upper Limb Surgery.

Our Society experienced a very active year. As the restrictions of the pandemic were lifted, we went back to in-person meetings which we missed a lot.

However, we continued with zoom trainings and webinars as well, and also organised combined meetings with other Societies.

The following are some of our 2022 highlights:

- **Upper Extremity Winter Symposium 6-10 January 2022, with the participation of the Shoulder and Elbow Surgery Society, and the Reconstructive Microsurgery Society.**
- **16th Annual Prof. Dr. Rıdvan Ege Advanced Hand Surgery Course and Workshop 25-26 February 2022.**



- **2nd Travelling Hand Surgery Course 14-18 March 2022.**
- **3rd Traveling Hand Surgery Course 14-18 November 2022.** These Traveling Courses are for 5 selected fellows who participate in surgical and clinical activities at various centers.
- **The Van Regional Meeting 26 March 2022.** This meeting was hosted by Van Yuzuncu Yil University. Many topics were discussed such as injuries, replantations, tendon transfers etc.
- **Upper Extremity Trauma Cadaver Course 17 September 2022.** This course is performed with fresh frozen cadavers and aims at surgical approaches and plate and screw fixation of upper extremity bones.
- **Upper Extremity Flaps and Flexor Tendon Cadaver Course 10 December 2022.** This course is performed with fresh frozen cadavers and aims at flap dissections and tendon repairs



Pictures from Cadaver courses

Advanced course faculty



National Congress announcement

Unfortunately Turkey has been influenced by two major earthquakes on the 6 February 2023.

The Turkish Society members donated two containers full of surgical material and equipment for the volunteer colleagues working in the devastated area. In collaboration with the Plastic and Reconstructive Surgery Society volunteer teams rotated at different hospitals.

The 18th National Hand and Upper Extremity Surgery Congress will be held in Eskişehir on 24-27 May 2023. We aim to prepare a scientific program that will allow sharing of new scientific and technological developments, as well as discussing current diagnosis and treatment approaches from contributions by national and international speakers.

Associate Professor Dr. Melih Bagir
Turkish Hand Society IFSSH Delegate

ASSOCIATION OF CHINESE-SPEAKING HAND SURGEONS UNITED (ACHSU)

The Association launched a series of online educational series over the past 4 years. After completion of 12 sessions of the Nanshan Lectures of Hand Surgery over a two-year period from 2020 to 2022, the Association started a new initiative: The Hand Surgery Book Club". The aims of this new initiative are to promote the quality of academic writings, how to construct chapter contents, and how to read academic literature critically.



Figure 1. The new best-selling Hand Surgery Book in Chinese.

Selected book chapters from the new Hand Surgery Textbook in Chinese (Figure 1) will be analyzed with regard to their features, practical usefulness, and any weaknesses. The discussed chapters will be compared with chapters of similar topics in other hand surgery books. Twenty-three senior surgeons of the Association are among the authors of this new authoritative book in the Chinese language. The Book Club is planned to be held three times a year.

The first meeting in this series was on 11 March 2023.

The topic of this session of the Book Club was soft tissue coverage of the hand. Five mid-career experts were invited to discuss this chapter, with an online audience of over 1500 colleagues from mainland China, Taiwan and their nearby regions.

The Association also organises regular Journal Clubs in both Chinese and English, four to five times a year. The Journal Clubs continuously attract over 1000 attendee each time from mainland China, Taiwan and nearby regions.

The 2023 annual Jixia Hand Surgery Forum will be held in Zhejiang from 17-18 June in both on-site and virtual formats.

Jing Chen

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AMERICAN SOCIETY FOR SURGERY OF THE HAND

Join us in Toronto, Ontario, Canada.

The American Society for Surgery of the Hand (ASSH) welcomes the participation of hand surgeons from throughout the world in our 78th Annual Meeting to be held from October 5-7 in Toronto, Ontario, Canada. This is the first time an ASSH Annual Meeting has been held outside of the United States.

Our program chairs, Megan A. Conti-Mica, MD and Paige M. Fox, MD, PhD have put together an exceptional program including:

- pre/postcourses,
- labs/demos,
- special keynote lectures,
- symposia,
- paper presentations,
- instructional courses,
- industry forums and more!

International Guest Society

This year's honored guest society will be the Swedish Society for Surgery of the Hand (SSSH). Posters submitted by the SSSH will be featured at this year's meeting and several speakers from the SSSH will enrich our program.

Kick-off Event

We will kick off the meeting with the Hand in Hand Fundraiser (formerly known as Handapalooza). This is a one-of-a-kind event where you can enjoy time with your fellow meeting attendees while supporting the American Foundation for Surgery of the Hand (AFSH). Featuring live music from three hand surgeon bands, the event will take place at the Steam Whistle Brewery, directly across the street from the convention center. International attendees can attend this event for free.

New Book Release

The highly anticipated 7th edition of Hand Surgery Update, edited by Warren C. Hammert, MD and Peter C. Rhee, MD will be available at the meeting. The book's 76 chapters are a summation of what has happened over the last 7 years, providing a true update for the hand surgeon.

We hope that you will join us in Toronto for the highest quality medical education and most recent research findings related to the upper extremity.



<https://www.assh.org/annualmeeting>

SWISS SOCIETY FOR SURGERY OF THE HAND



2022 was - and it still is - a crazy, a stressful year. We all hoped that normality would return after the corona pandemic. Instead, we are experiencing a terrible war just 1,000 kilometers away as the crow flies, we have record high inflation, and we are facing an energy crisis.

The Swiss healthcare system is also going crazy. Politicians regulate like crazy, launch one austerity measure after the other and absolutely refuse to recognize that our health system, which is still excellent in itself, is being driven to the wall. But even the FMH (Foederatio Medicorum Helveticorum), our medical guild is powerless. Its 42,000 members have to watch as new "savings measures" are discussed and dealt with in Parliament, always with the noble aim of curbing the "explosion" in health care costs. However, in fact these cost-cutting measures do not lead to any sustainable savings because they only reduce the quality and safety of medical care. The essence of the so-called "explosion" of health care costs are not addressed.

Our Society (SGH) has 208 members, all of whom are highly qualified medical specialists. Three years ago, "Handfacts", a new platform, was created and its importance is increasingly recognised. Our commitment is noticed and respected. The website is: www.handfacts.ch

However, is this reflected in a higher tax point value (fee for service value) for hand surgery services?

Are hand surgeons excluded from savings exercises? No. So far we haven't discovered a magic trick with which we, as a small Society, can achieve more than the FMH with its 42,000 members. Instead, we have focused on our advantages as an agile, highly specialized Society and are in the process of developing measures tailored to our needs and possibilities that can help us advance. These topics were intensively discussed during our Annual Congress and at the General Assembly of our Society

Apart from politics, the past year offered several international high-standing congresses with the start of the 15th IFSSH / 12th IFSHT Triennial Congress in London from 6-10 June 2022. This Congress was a spectacular week of reconnecting with colleagues in person in London. Over 3600 hand surgeons and therapists from 89 countries participated in the Congress, experiencing a sophisticated scientific programme and enjoying the social events. Daniel Herren as the Secretary General of FESSH (2021-2022) gave an impressive speech.



Daniel Herren, Secretary General of FESSH together with colleagues after a meeting on CMC-1 arthroplasty held in Zurich.

Beat Simmen, former head of the Hand Surgery and Upper Limb Department at the Schulthess Clinic (Zurich), was honored as a Pioneer of Hand Surgery by the IFSSH. He is the 6th Pioneer from Switzerland

(Claude Verdan 1986, André Chamay 2010, Viktor E. Meyer 2010, Ueli Büchler 2016, Diego Fernandez 2019). In his long career, he made enormous international contributions in the field of hand surgery and in particular in the field of rheumatoid arthritis. Beat and his wife are in good health and also enjoyed meeting many old colleagues at the London Congress.



Beat R. Simmen was honoured as a IFSSH Pioneer of Hand Surgery.

"360° Quality"

The 55th Swiss Annual Hand Surgery and 23st Hand Therapist Congress on 24-25 November 2022 was held in Thun, hosted by President Maurizio Calcagni during his first term. Over 767 participants attended the Congress who shared their knowledge between surgeons, therapists and the industry. The main topic of the Congress was "360° Quality". There were many interactive, well moderated sessions by local and international guests. The aim is to define quality managements and treatments in hand surgery and therapy.

President Maurizio Calcagni (former Secretary General of FESSH 2019-2020) and the Council organized an interesting panel discussion in Thun. This included representatives of the medical profession, health insurance companies and the online comparison service Comparis discussing the rising cost of living and the demands of wage indexation by many professional groups including the medical profession.

Discussion points included the constantly falling tax point values, while the member fee contributions are increasing and the awareness campaign for Hand Surgery in Switzerland is promoted.



Council at the General Assembly on 25. November 2022, Maurizio Calcagni, the president, 5th from the left.

**Esther Vögelin,
Stephan Schindele and
Maurizio Calcagni**

AMERICAN ASSOCIATION FOR HAND SURGERY (AAHS)

The American Association for Hand Surgery (AAHS) is pleased to again share an update with the IFSSH community.

The AAHS hosted its 2023 Annual Meeting with record registration this past January in Miami, Florida. Under the leadership of Dr. John Lubahn, program chairs Dr. Josh Gillis, Dr. Nick Crosby, Gayle Severance and Vanessa Smith organized a diverse and engaging program which included 24 instructional course lectures and 7 educational symposia with an outstanding faculty. The combined sessions with American Society for Peripheral Nerve (ASPN) and American Society for Reconstructive Microsurgery (ASRM), which always meet together with AAHS, were excellent and highly attended, as they are each year.



This year's meeting was highlighted by a lecture from well-known wood sculptor and artist John Powers on what could have been a career ending injury when a table saw he was using kicked back amputating his left ring finger and thumb. His highly qualified and empathetic care team led by hand and microsurgeon Dr. Jacques Hacqubord, who accompanied him for the presentation, helped John work his way back to becoming a productive artist again. See the New York Times article here: [He Lost Fingers in an Accident. Now It's Inspiring His Art.](#) - The New York Times.

A symposium chaired by Dr. Miguel Pirela-Cruz on overcoming adversity and resistance through perseverance featured outstanding presentations by Col. Richard Toliver, of the famed Tuskegee Airman lineage, on his life and career as an Air Force pilot during the Vietnam War and after. Dr. Tracy Downs from the University of Virginia spoke on the importance of diversity and inclusion in medicine today.

Past President Dr. Mark Baratz honored the Jay Ryu legacy with a creative, thoughtful, and visionary presentation on the importance of embracing change in medicine. Mark demonstrated how we can continue to provide the highest quality of care to our patients while being environmentally responsible, and minimizing the amount of solid waste generated in the OR. Fewer follow up visits and the use of telemedicine can be important as well in minimizing travel costs to patients.

Dr. Lee Osterman, also a Past President, delivered the Joseph Danyo lecture, honoring the first President of the American Association of Hand Surgery. Dr. Osterman entertained, educated, and enlightened those in attendance with anecdotes of his formative years, his journey from Hand Fellow to Hand attending, and lessons learned from his lifelong quest to learn, enrich, and educate.

Asif Illyas won the prestigious Lean and Green Award, and Gretchen Bachman provided a beautiful celebratory announcement to honor Dr. Becky Neiduski with the 2023 Humanitarian Award.

AAHS is grateful for the participation of so many members of the Japanese Hand Society, who traveled 7,500 miles to represent their country from the podium, instructional course lectures and poster presentations! Learn about the JSSH.

The Program Committee, currently being led by Drs. Kyle Eberlin and Meredith Osterman, is developing the best educational programme in Hand Surgery at one of the best locations, for our 2024 Annual Meeting at the Baha Mar resort in Nassau, Bahamas. See more information on the Baha Mar resort. Please visit the AAHS website for meeting information to be announced soon.

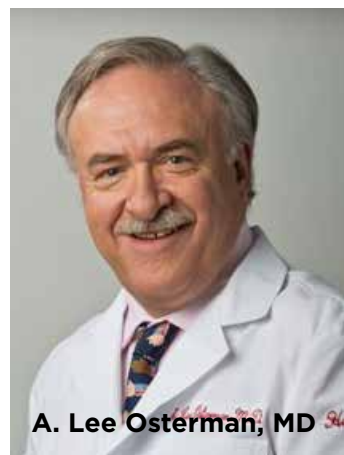
AAHS will continue to provide year round education through its webinar series, organized by Sonu Jain, MD and the AAHS webinar committee. This series is designed with the Association core values of inclusion and synergy in mind, and features collaboration with affiliate societies including American Society for Peripheral Nerve (ASPN), American Society for Reconstructive Microsurgery (ASRM), American Society for Surgery of the Hand (ASSH), American Academy of Orthopaedic Surgeons (AAOS), American Shoulder and Elbow Surgeons (ASES), American Society of Hand Therapists (ASHT), Pediatric Orthopaedic Society of North America (POSNA), and Orthopaedic Trauma Association (OTA) to strengthen the education delivered to our hand care community.

Information is available on the AAHS website. Please also be sure to see past webinar replays, which are FREE to all!

The AAHS was thrilled to celebrate the above Pioneers in Hand Surgery during the London IFSSH meeting in 2022, and looks forward to celebrating more pioneer



Robert C. Russell, MD



A. Lee Osterman, MD



Peter C. Amadio, MD



Susan E. Mackinnon, MD

members while it co-hosts the IFSSH triennial meeting in 2025! More announcements regarding the 2025 Congress will be made soon. We can't wait to see you there! Watch the Welcome to Washington, DC video.

Be sure to follow AAHS on social media to participate in the Weekly AASHk program which challenges the community's hand care knowledge each week as well as other tips, tricks, and updates.



Allen L. Van Beek, MD

VENEZUELAN SOCIETY FOR SURGERY OF THE HAND (SVCMRMS)

Due to all the political, economic and social situations experienced in Venezuela during 2017-2019 and the Covid 19 pandemic in 2020 - 2022, the participation of our Society at the regional and global level was greatly reduced. However, our academic activity has been progressively reactivated so that the Society resumes its position as a pioneer of our specialty in Latin America.

On 25 March 2023, an academic meeting was held in Caracas, moderated by Dr. Carlos Morales, a Venezuelan doctor living in Chile, and accompanied by a multidisciplinary team. They presented clinical cases, demonstrated the use of synthesis material and delivered scientific talks. The international specialists included Marcio Aita (Brazil), Rene Jorquera (Chile), Juan Varela and Alex Berenguer (Spain), Fabio

Tandioy (Colombia), Anlam Arnaout (France), Ezequiel Zaidenberg and Paula Simaro (Argentina).

On 5 May 2023 a Scientific Conference will be hosted at the Dr. Miguel Perez Carreño Hospital by Dr. Rodolfo Contreras to celebrate the 60th anniversary of the founding of the Hand Surgery Service by Dr. Ricardo Sánchez Beaujon. The national speakers include Rodolfo Contreras, Alex Quintero, Marcos Saavedra, José Vicari, Aloa Isea, Abrahan Marsal and Tito Barraez and the international speakers will be Mauricio Garcia (Mexico), Francisco Soldado (Spain) and Roberto Meléndez (Colombia).

From 21-23 June 2023, the LXIII Venezuelan Congress of Hand and Reconstructive Surgery of the Upper Limb will be held in the Carlos Klempner Auditorium of the La Trinidad Teaching Medical Center in the city of Caracas in honor of Dr. Nelson Enrique Socorro Medina. The confirmed speakers so far will be Jesús Hernández, Orlando de la Cruz, Carlos Morales, Nelson Socorro,

ENCUENTRO ACADÉMICO CARACAS - VENEZUELA

ALMUERZO CON CIRUGÍA MANO CASOS
25 DE MARZO DE 2023

• *Discusión de Casos problemas Presencial/Virtual*
• *Hands on. Piezas sintéticas*
• *Charlas científicas*
• *Almuerzo académico*

Speakers: Fabio Tandioy, René Jorquera, Juan Varela, Alex Berenguer, Anlam Arnaout, Ezequiel Zaidenberg, Paula Simaro, Carlos Morales (Moderador), Marcio Aita.

Logos: ORTHO CARE, @cirugia_de_manocasos

JORNADA CIENTIFICA CIRUGIA DE LA MANO
"Dr. Rodolfo Contreras"

5 DE MAYO 2023
AUDITORIO DEL HOSPITAL MIGUEL PEREZ CARREÑO

Es con motivo del 60 aniversario de la fundación del servicio de Cirugía de la mano "Dr. Ricardo Sánchez Beaujon"



Gaetano de Santolo, Thair Moreno and for Iberoamerica: Antonio Tufi, Marcio Aita, Jefferson Braga, Ricardo Kaempf (Brazil), Sergio Daroda, Ezequiel Zaidenberg (Argentina), Rene Jorquera (Chile), Matías Craviotto (Uruguay), Gustavo Vivé (Paraguay), Juan González (Guatemala), Aida Garcia, Fabio Tandioy, Fredy Angarita (Colombia), Alejandro Espinosa, Jorge Clifton (Mexico), Cristhian Castro (Costa Rica), Pedro Delgado, Francisco Soldado and Samuel Pajares (Spain)

Jose Vicari,
President SVCMRMS

AUSTRALIAN HAND SURGERY SOCIETY

Annual Scientific Meeting, Sydney, 1-4 March 2023

March is generally a good month to be in Sydney and the city really turned it on for our local, regional and international delegates at this year's Australian Hand Surgery Society (AHSS) Annual Scientific Meeting!

We were delighted to host the British Hand Surgery Society (BSSH) as our guest society, and thank members and their families for their valuable contributions to our meeting.

Delegates united at the Hyatt Regency on the eve of 1 March against a stunning backdrop of harbour views and the setting sun.

Our International Guest Speaker Max Haerle (Germany) was first to take the podium, for one of many insightful lectures on current concepts in hand and wrist surgery, including the Bernie O'Brien Oration on 'Scapholunate Ligament Instability'.



'Ashes Debate' AHSS vs BSSH (Sydney, Australia)

International Guest Speaker Jagdeep Nanchahal (UK) shared his research on novel therapeutic targets and its translation to clinical trials in the setting of Dupuytren's Disease, receiving the John Hueston Award for best paper on the condition.



International Guest Speaker Charles Goldfarb (USA) 'virtually' captivated the congress with his work in the field of sports-related injuries, registries and his globally expanding 'Upper Hand' Podcast.

Jennifer Green and Dean Boyce led a stimulating symposia on diversity in hand surgery; amongst many other outstanding symposia, lectures, free papers and discussions/debates (too many to individually acclaim!). Of note, the Bruce Connolly Best Paper Prize was awarded to Jeff Ecker for 'The Hook Test is Not Pathognomonic for Foveal Detachment of the Triangular Fibrocartilage'; and Tim Herbert Award for Innovation in Hand Surgery to Xin Zhang for 'A Novel Dynamic Cadaveric Wrist Simulator For 3-Dimensional Carpal Bone Motion Measurement Using Biplane X-ray Fluoroscopy'.

While the victory urn for the inaugural 'Ashes Debate' may be temporarily on international soil, it should be known that victory by water was also claimed by the Brits at the conference sailing regatta.

Needless to say our social program was received as well as the academic. PFET trainee and alumni cocktails at the colourful Jackalberry Bar, drinks and dinner amongst the dinosaurs at The Australian Museum, and the grand finale dinner at Taronga Zoo following yet another stunning Sydney sunset.



Conference Conveners Richard Lawson and Sarah Tolerton (AHSS) with International Guest Speaker Professor Max Haerle (Germany) (AHSS ASM 23, Sydney, Australia)



IFSSH AHSS Delegate Gregory Bain toasting at The Australian Museum (AHSS ASM 23, Sydney, Australia)

With a grand total of 229 registrants, including 36 internationals and 26 local registrars and PFET trainees; the success of this year's meeting reflects the current and future strength of our Society.

Many thanks as always to our industry support, Wayne Taylor & co. from Taylored Images, the AHSS Board and members.

Run by our Society, for our Society, we hope this year's ASM fulfilled your educational and social needs, and look forward to seeing you at the next!

Sarah Tolerton & Richard Lawson
AHSS ASM 23 Conveners



Chair Pierluigi Tos



16th Congress of the
EUROPEAN FEDERATION OF SOCIETIES FOR MICROSURGERY EFSM 2024

9-12 MAY 2024 **MILAN ITALY**



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& 8TH APWA CONGRESS**
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31st May - 3rd June 2023 • Singapore

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**ASIA-PACIFIC'S LARGEST REGIONAL
HAND SURGERY MEETING!**

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- ✓ Programme covers the full spectrum of hand and wrist surgery from basic science through to wrist and elbow
- ✓ Earn CME points!
- ✓ Exciting line-up of internationally renowned speakers including Robert Pho, Tunku Sara, Marc Garcia-Elias, Raja Sabapathy and Fu Chan Wei



460
EXPERT SPEAKERS



450
ABSTRACTS SUBMITTED



80
LIVE SESSIONS

31st May - 3rd June 2023, Singapore

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