



IFSSH Scientific Committee on Rheumatoid Arthritis

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Indications for Arthrodesis and Arthroplasty of the PIP Joints

Introduction:

Synovitis of the proximal interphalangeal joints causes elongation of the central slip of the extensor apparatus, mainly from destruction of the dorsal plate, resulting in loss of active joint extension. The connective tissue holding the lateral bands at the dorsum of the joint also elongates, and the lateral bands will progressively displace anterior to the joint axis of rotation, increasing flexion forces and deformity of the joint. The entire extensor apparatus also displaces in a proximal direction, causing a hyperextension deformity of the DIP joint. This is known as a boutonnière or button-hole deformity, because the condyles of the proximal phalanx protrude dorsally between both lateral bands. The opposite deformity is known as a swan neck deformity, in which case there is an imbalance in favour of the extension forces over the flexion forces on the PIP joint. Gliding of the extrinsic finger flexor tendons is restricted from synovitis, while intrinsic muscles are used for finger flexion, causing a hyperextension deformity of the PIP joint.

The indication for arthrodesis or arthroplasty is usually based on the degree of the destroyed joint surfaces. This requires a radiological examination, as the severity of boutonnière or swan neck deformities are not directly related to the degree of joint destruction. As a matter of fact, PIP joint surfaces may be preserved in severe boutonnière deformities, in which joint synovitis was so intense that the deformity occurred in a short period of time, leaving the joint at rest in a flexed position, leading to the healing of the PIP joint synovitis.

Arthrodesis:

Arthrodesis is indicated for the treatment of boutonnière deformities with destruction of the joint surfaces. Severe boutonnière deformities are also best treated with an arthrodesis, as it is very difficult to reconstruct the extensor mechanism in these cases.

Arthrodesis of the PIP joint of a single digit, except for the index finger, can be quite disabling, mainly if it involves the ring finger. Fusion of all PIP joints provides good functional and aesthetic results when all PIP joints are involved.

The position of joint fusion should be discussed with the patient, as a small amount of flexion will provide a better aesthetic appearance of the fingers with the disadvantage of losing grasping function, and the opposite when the joint is fused in a more flexed position. The amount of flexion of PIP joint fusion should progressively increase from index to the small finger. Function of the MP joints should also be taken into account. Patients with MP joints that can hyperextend will tolerate greater degrees of PIP joint flexion than patients with a flexion contracture of the MP joints. The length and deformity of the thumb should also be taken into account when fusing the PIP joint of the index finger, as a pulp to pulp pinch between the two is desirable.

Arthroplasty:

Treating a boutonnière deformity with an implant arthroplasty can be quite deceiving, as the most difficult lesion to correct is the destroyed extensor tendon apparatus, leading to a recurrence of the deformity if joint mobility is started soon after the procedure. Joint immobilisation in extension for longer periods of time will lead to stiffness in extension, and the patient will be unhappy, as he prefers to lose the last degrees of joint extension rather than those of finger flexion, which are very useful for grasping objects.

On the other hand, most swan neck deformities with destroyed PIP joints can be treated with an implant arthroplasty, as the integrity of the extensor apparatus is preserved in most of these cases.

Flexible silicone implant arthroplasties are not a good indication for the PIP joints, as they do not provide lateral stability, thus causing ulnar inclination deformities and ultimately rupture of the implants. Periprosthetic fibrosis from the encapsulation process will also restrict the range of joint mobility. The best choice is the use of a two component anatomical implant, with metal to UHMWP or pyrolytic carbon bearing surfaces.