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European Board of Hand Surgery (EBHS) Examination Questions

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Question 1

The flexor pollicis longus (FPL)

A	May have an accessory head termed Gantzer's muscle	T/F
B	Has a synovial sheath that communicates at the wrist with the sheath of the ring finger	T/F
C	Is a bipennate muscle	T/F
D	The A1 pulley is situated closer to the radial digital nerve than the ulnar digital nerve	T/F
E	The muscle belly receives its blood supply from a branch of the common interosseous artery	T/F

Question 2

Radial longitudinal dysplasia

A	In TAR syndrome the thumb is characteristically present	T/F
B	Is often associated with talipes equinovarus	T/F
C	Is associated with Fanconi anaemia	T/F
D	Is characteristically diagnosed in the second year of life	T/F
E	The incidence is 1:1000 live births	T/F

Question 3

Chronic exertional compartment syndrome of the forearm

A	Symptoms are usually bilateral	T/F
B	MRI can be useful in the diagnosis	T/F
C	Three compartments are commonly described	T/F
D	Pressure measurements should be taken 30 minutes after exercise	T/F
E	Decompression of all compartments gives superior results	T/F

EBHS questions October 2023 – answers

Question 1

Flexor pollicis longus

A	May have an accessory head termed Gantzer's muscle	T
B	Has a synovial sheath which communicates at the wrist with the sheath of the ring finger	F
C	Is a bipennate muscle	F
D	The A1 pulley is situated closer to the radial digital nerve than the ulnar digital nerve	T
E	The muscle belly receives its blood supply from the common interosseous artery	F

In a cadaveric dissection study, Gantzer's muscle was found in 68% of limbs and was supplied by the anterior interosseous nerve. It arose from the deep surface of the flexor digitorum superficialis muscle (42 limbs), coronoid process (eight limbs) and medial epicondyle (seven limbs). Its insertion was to the ulnar part of the flexor pollicis longus (FPL) muscle. Gantzer's muscle always lays posterior to both the median and anterior interosseous nerve (Caetano et al., 2015). The authors consider that this should be seen as normal rather than a variation. The FPL bursa communicates with the radial bursa, the little finger with the ulna bursa. These can communicate at the level of the wrist (Yu, 2004). The ring finger sheath does not, however, normally communicate with the ulnar bursa although variations are described (Schmidt and Lanz 2003). The FPL is a unipenniform muscle (Yu, 2004). The common interosseous artery is a short artery that bifurcates into anterior and posterior interosseous arteries. The FPL muscle belly is supplied by the anterior interosseous artery (Yu, 2004).

Question 2

Radial longitudinal dysplasia

A	In TAR syndrome the thumb is characteristically present	T
B	Is often associated with talipes equinovarus	F
C	Is associated with Fanconi anaemia	T
D	Is characteristically diagnosed in the second year of life	F
E	The incidence is 1:1000 live births	F

In TAR (thrombocytopenia absent radius) syndrome, the thumbs are always present (Goldfarb et al., 2007) even though they are usually hypoplastic. Radial aplasia can be associated with talipes equinovarus as part of the TAR syndrome; however, other than that it is uncommon. Fanconi's anaemia is another association of radial dysplasia and should be investigated at a young age, as they have a risk of early malignancies and anaemia that may only manifest in the preschool age. Early diagnosis is therefore relevant and should be sought for by genetic or haematological analyses (Bourke et al., 2022). The condition of radial dysplasia is usually obvious, and an abnormality is seen at birth, except for very mild distal radial shortening. The incidence is much rarer than 1:1000, usually 1:30,000 to 1:100,000 (Bayne and Klug, 1987).

Question 3

Chronic exertional compartment syndrome of the forearm

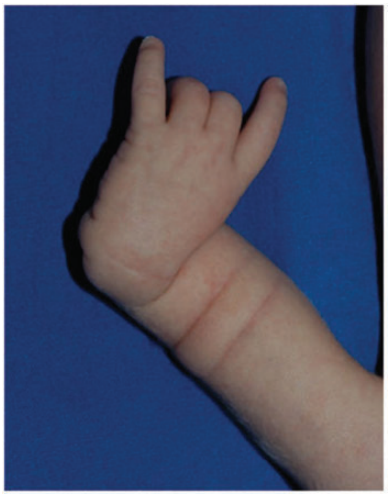
A	Symptoms are usually bilateral	T
B	MRI can be useful in the diagnosis	T
C	Three compartments are commonly described	F
D	Pressure measurements should be taken 30 minutes after exercise	F
E	Decompression of all compartments gives superior results	F

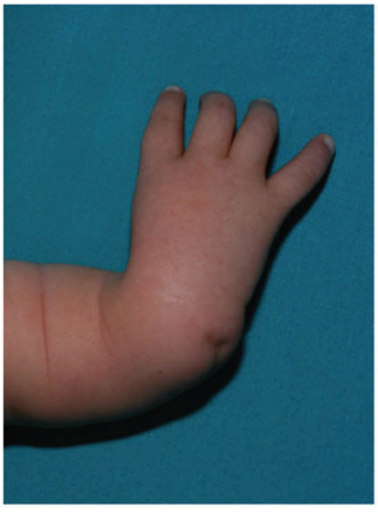
Chronic exertional compartment syndrome results from increased blood flow and muscle volume during exercise, most commonly seen in motorcycle riders (Smeraglia, 2021). Forearm pain, weakness and paraesthesia occur during exercise and are bilateral in 70%–100% of patients (Barrera-Ochoa, 2016). Diagnosis can be confirmed by raised compartmental pressures on monitoring 1–5 minutes after exercise, or by increased signal intensity and signal-to-noise ratio on immediate post-exercise MRI (Gielen, 2009). Separate dorsal, mobile wad, superficial volar, deep volar and pronator quadratus compartments have been described (Chan, 1998), although limited fasciotomy of the superficial volar compartment alone has been described with at least equivalent results to open fasciotomy of all compartments (Harrison, 2013; Smeraglia, 2021).

Clinical case

A 1-month-old girl. She is the first girl of a healthy family. Photographs of both upper limbs are shown. Please describe what you see in the photographs.

- What is your diagnosis?
- What investigations would you arrange?
- What other systemic associations should you be aware of?
- How would you manage this patient?





Courtesy of Daniel Weber, on behalf of PULPe (Paediatric Upper Limb Project).

Answer

Minimal expected knowledge:

The appearances are those of a bilateral radial longitudinal dysplasia. Avoid the term 'radial club hand'. You should comment that the wrist is radially deviated. You should also mention that the thumb appears to be absent. Finally, you should mention that the elbow creases appear to be present, but you would like to examine the elbow for stiffness and to see if there is active flexion.

Investigations:

Radiographs of the entire upper limb are needed to confirm diagnosis and grading:

Grading of the degree of radial hypoplasia/aplasia is according to Bayne and Klug (1987), who classify the degree of radial aplasia as four types:

- Type I: short distal radius
- Type II: hypoplastic radius in miniature
- Type III: absent distal radius
- Type IV: complete absent radius

The most popular grading system for thumb hypoplasia/aplasia is Manske and McCarooll's modification of Blauth's classification: types I–V, although this has recently be modified by Tonkin (2014).

Note that James et al. (2004) graded radial deficiency with thumb hypoplasia as a spectrum and involvement of the carpus with the addition of N and 0:

- N: normal carpus and distal radius but hypoplastic thumb
- 0: abnormal carpus, normal distal radius but hypoplastic thumb

Other investigations:

Radial deficiency is associated with a few syndromes that you need to be aware of. For this case, it is unlikely to be TAR (thrombocytopenia absent radius) syndrome as the thumbs are always present (Goldfarb et al., 2007).

Other associated syndromes include VACTERL (vertebral defects, anal atresia, cardiac defects, tracheo-oesophageal fistula, renal anomalies and limb abnormalities) and Holt-Oram (usually congenital cardiac septal defects).

Another associated condition is Fanconi anaemia. Approximately 60% of all children with Fanconi anaemia have a thumb hypoplasia and even unilateral thumb hypoplasia must be screened. They have a risk of early malignancies and anaemia that may only manifest at preschool age. Early diagnosis is therefore relevant and should be sought for by genetic or haematological analyses (Bourke et al., 2022).

Management of the patient starts with gentle massage and manipulation of the wrist and fingers by the parents under an occupational therapist's guidance from birth onwards.

Standard surgical management at most centres includes soft tissue distraction, followed by radialization (straightening the carpus over other ulna) and pollicization. Elbow stiffness is a contraindication to radialization.

The burden of treatment must be balanced against the potential benefit, as the rate of wrist recurrence is high. For this reason, some centres prefer a soft tissue release only. Treatment recommendation must be individualized and take into account associated diagnoses and the resources of the family (Ezaki, 2021).

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