

Radio-Ulnar Synostosis

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Abstract: Radio-ulnar Synostosis is a rare condition in which there is an abnormal connection (Synostosis) of the radius and ulna (bones in the forearm) at birth. The condition is present in both arms (bilateral) in approximately 60% of cases. Earlier we saw during routine dissection of elbow joint and superior radio ulnar joint bony fusion of upper end of ulna with radius. Now in our hospital we came across a similar case of Radio-ulnar synostosis limiting the movements in both the forearms for the patient. First osteotomy of radius and ulna was done on the left side and the forearm was kept in the mid prone position and POP was put. At the next sitting the same procedure will be repeated on the right side. Fixing the forearms in pronation will help the patient to carry out essential functions.

Key words: Synostosis, Osteotomy, Pronation

I. Introduction

Radio-ulnar synostosis is a rare condition in which there is an abnormal connection (Synostosis) of the radius and ulna at birth. The condition is present in both arms (bilateral) in approximately 60% of cases. Signs and symptoms depend on the severity of the abnormality and whether it is bilateral. Affected individuals often have limited rotational movement of the forearm.

II. Embryology

Upper limb bud arises at 26 days of age. Growth and differentiation continue until 46 days of age. Longitudinal segmentation produces separation of the distal radius and ulna. For a time the proximal radius and ulna are united and share a common Perichondrium. Abnormal genetic or teratogenic factors operating at this time would interfere with proximal radio-ulnar joint morphogenesis.

III. Epidemiology: -

Usually sporadic, can be associated with family history, autosomal dominant with variable expression. 60% bilateral. Equal male to female distribution is seen.

IV. Materials And Methods

Earlier we saw during routine dissection of elbow joint and superior radio ulnar joint bony fusion of upper end of ulna with radius.

Now in our hospital we came across a similar case of Radio-ulnar synostosis limiting the movements of the forearm bilaterally in a female patient

V. Observation

In the cadaver the fusion involved the upper end and extended upto the level of oblique cord (Fig:1) which is also replaced by bone. Curvature of the radius was a little exaggerated with a small Pronator quadratus (Fig: 2). Between the marrow cavity of ulna and radius there was an intervening bony trabeculae (Fig: 3) was seen. Now in our hospital we came across a similar case of Radio-ulnar synostosis limiting the movements for the patient. Nivedha, 13 years old girl complained of pain and inability to use both the forearms due to restriction of pronation. X-ray showed bilateral proximal radio-ulnar synostosis [Fig: 4(a)]. C.T. Scan showed proximal radio ulnar bony synostosis. Radial head showed mild hypoplasia. There was no agenesis of pronator muscle. No vascular malformation is seen. Ultra high field 3T MRI was done – “Right side was bowed medially with radial head & neck and radial tuberosity fused with anteromedial aspect of the ulna - proximal radio ulnar synostosis. Radial head was mildly hypoplastic, minimal right elbow joint effusion was present” (Fig: 5).

Planned to do bilateral osteotomy of radius and ulna distal to the synostosis. First osteotomy of radius and ulna was done in the left side and the forearm is kept in mid prone position and POP was put.[Fig.4b] At the next sitting the same procedure will be repeated on the right side.

VI. Discussion

It has been suggested that individuals whose forearms are fixed in greater amounts of pronation (> 60 degrees) have more problems than those with around 20 degrees. In bilateral cases where function is impaired,

recommendations for the optimum position of the non-dominant arm range from neutral to 30-40 degrees of supination.

VII. Inference

Fixing the forearms in pronation will help the patient to carry out essential functions.

References

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Fig: 1 - The fusion involved the upper end and extended upto the level of oblique cord



Fig: 2 - Curvature of the radius was a little exaggerated with a small Pronator Quadratus



Fig: 3 - Between the marrow cavity of ulna and radius a bony trabeculae was seen intervening



Fig: 4(a)



Fig: 4(b)

Fig: 4 (a) – Shows synostosis of proximal part of radius & ulna

Fig : 4(b)- After Osteotomy POP applied in mid prone position



Fig: 5 - Ultra high field 3T MRI was done – “Right side was bowed medially with radial head & neck and radial tuberosity fused with anteromedial aspect of the ulna - proximal radio ulnar synostosis. Radial head was mildly hypoplastic, minimal right elbow joint effusion was present”.