Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Radiology Service

Congenital Radioulnar Synostosis – A Case Report

Mennis N[1*], Chaja W[1], Zouita B[1], Basraoui D[1], Jalal H[1]

[1]Service Radiologie, Hôpital Mere-enfant, CHU Mohammed VI, Marrakech, Morocco

DOI: 10.36347/sjmcr.2023.v11i12.020 | **Received:** 25.05.2023 | **Accepted:** 23.06.2023 | **Published:** 25.12.2023

***Corresponding author:** Mennis Nizar
Service Radiologie, Hôpital Mere-enfant, CHU Mohammed VI, Marrakech, Morocco

Abstract **Case Report**

Congenital radio-ulnar synostosis (CRS) is a rare congenital disorder characterized by the fusion of the radius and ulna bones in the forearm. This results in a lack of mobility and flexibility in the forearm, and can cause functional limitations, including difficulty with grasping and holding objects. A 4-year-old child with pain and restricted mobility of the elbow joint was admitted to the hospital. Plain film radiography and CT examination was performed. Radiological examinations showed a congenital proximal radioulnar synostosis. Diagnostic imaging including computed tomography with three-dimentional (3D) reconstructions, preceding surgery enables planning of the surgical treatment.

Keywords: Radioulnar synostosis, congenital, pediatric, X-ray, CT scan.

BACKGROUND

Sandifort described congenital radioulnar synostosis in 1793 [1,2]. The exact incidence of CRS is unknown, but there are around 350 examples of congenital radioulnar synostosis reported in the literature [2-3]. Congenital radio-ulnar synostosis (CRS) is a rare congenital disorder characterized by the fusion of the radius and ulna bones in the forearm. This results in a lack of mobility and flexibility in the forearm, and can cause functional limitations, including difficulty with grasping and holding objects [4,5]. However, this is the most prevalent congenital functional elbow joint disease. It is seen bilaterally in 60-80% of cases [1]. This deformity is genetically conditioned in 25% of instances [6]. Congenital radioulnar synostosis is also one of several components of chromosomal aberration malformation syndromes in children [7].

CASE REPORT

A 4-year-old child was admitted to the mother and children hospital of University hospital of Marrakech. The boy complained of minor pain within the area of the left elbow joint, mobility limitations, difficulties in grasping and atrophy of the atrophy of the left forearm muscles. Family and trauma history was negative. Physical examination showed a deformed and slightly valgus elbow, fixed on a pronate position as well as lack of full supination. Limb innervation and perfusion were normal. The child was in good general health state. The psychomotor development was appropriate for age. There were no other concomitant malformations.

The previously performed X-rays showed proximal radioulnar synostosis with a curved radial bone. CT confirmed the presence of bone anomaly in the form of radioulnar synostosis type III according to Cleary and Omer classification. A 3D reconstruction allowed for spatial visualisation of the existing malformation and reciprocal anatomical relations within the bone structures.

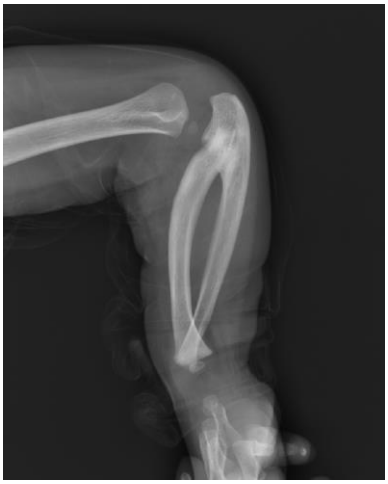

Figure 1: Profile Xray of the left elbow joint showing proximal radio-ulnar synostosis and a curved radial bone

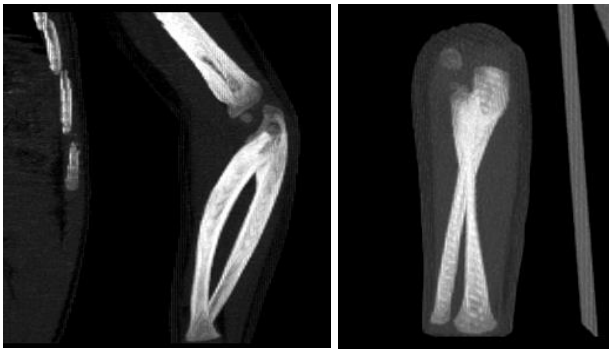

Figure 2: CT examination of the elbow joint, Sagittal and coronal views with MIP reconstruction showing proximal radioulnar synostosis

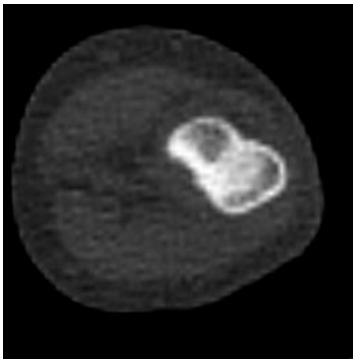

Figure 3: CT examination of the elbow joint, axial view showing the synostosis of the radial head and the coronoid process.

Figure 4: CT examination of the elbow joint, 3D reconstruction, radioulnar synostosis in antero-medial view

DISCUSSION

Congenital radioulnar synostosis is a deformity that appears in the early stages of pregnancy. The elbow appears during the 34-35th day of foetal life, whereas the humerus, radial bone, and ulna occur on the 37th day [3,8]. Any negative stimulus during this stage produces a disruption in segmentation, which leads to malformation [3]. Congenital radioulnar synostosis is most common in children aged 2 to 5 years old [1]. The diagnosis of CRS is often made through clinical examination and imaging studies. Radiography is the primary imaging modality used to diagnose CRS, but it may not be able to provide enough information about the extent of the bone fusion. In these cases, computed tomography (CT) and magnetic resonance imaging (MRI) can provide additional information about the bone and soft tissue structures involved in the fusion

In the majority of instances, the deformity is evaluated using Cleary and Omer's categorization [1,8]. In type I, the radial bone shrinks, and the fusion does not include bones; in type II, there is a radioulnar synostosis, and the remaining bone structures indicate no further alterations. There is a radioulnar synostosis, hypoplastic head of the radial bone, and posterior radial head subluxation in type III. There is a short radioulnar synostosis, mushroom-shaped malformation of the radial bone head, and anterior subluxation of the radial head in type IV.

The treatment of CRS depends on the type and severity of the disorder. Conservative treatment options include splinting and physiotherapy, which can help to improve the function of the affected limb. Surgical options include derotational osteotomy, arthrodesis, and arthroplasty. The goal of surgery is to improve the function of the affected limb and to prevent the development of secondary complications, such as joint degeneration and osteoarthritis. A preoperative CT with 3D reconstructions will correctly depict the anatomical relationships and the spatial arrangement of the bone components, allowing for thorough surgical planning [9].

CONCLUSION

CRS is a rare congenital disorder that can cause functional limitations in the affected limb. The diagnosis of CRS is often made through clinical examination and imaging studies, with radiography being the primary imaging modality. However, CT and MRI can provide additional information about the bone and soft tissue structures involved in the fusion. The treatment of CRS depends on the type and severity of the disorder, and may include conservative or surgical options. The importance of multimodality imaging in the diagnosis and management of CRS cannot be overstated.

REFERENCES

1. Lescault, E., Mulligan, J., & Williams, G. (2000). Congenital radioulnar synostosis in an active duty soldier: case report and literature review. *Military medicine*, *165*(5), 425-428.
2. Fakoor, M. (2006). Radioulnar synostosis in a father and his 5 year old daughter. *Pak J Med Sci*, *22*(2), 191-93.
3. Wurapa, R. (2009). Radial-ulnar synostosis. eMedicine. *http://emedicine.medscape.com/article/1240467-overview*
4. Masuko, T., Kato, H., Minami, A., Inoue, M., & Hirayama, T. (2004). Surgical treatment of acute elbow flexion contracture in patients with congenital proximal radioulnar synostosis: a report of two cases. *JBJS*, *86*(7), 1528-1533.
5. Kao, H. K., Chen, H. C., & Chen, H. T. (2005). Congenital radioulnar synostosis treated using a microvascular free fasio-fat flap. *Chang Gung Med J*, *28*(2), 117-22.
6. Yammine, K., Salon, A., & Pouliquen, J. C. (1998, January). Congenital radioulnar synostosis: study of a series of 37 children and adolescents. In *Annales de Chirurgie de la Main et du Membre Supérieur* (Vol. 17, No. 4, pp. 300-308). Elsevier Masson.
7. Cho, Y. G., Kim, D. S., Lee, H. S., Cho, S. C., & Choi, S. I. (2004). A case of 49, XXXXX in which the extra X chromosomes were maternal in origin. *Journal of clinical pathology*, *57*(9), 1004-1006.
8. Elliott, A. M., Kibria, L., & Reed, M. H. (2010). The developmental spectrum of proximal radioulnar synostosis. *Skeletal radiology*, *39*, 49-54.
9. Cleary, J. E., & Omer Jr, G. E. (1985). Congenital proximal radio-ulnar synostosis. Natural history and functional assessment. *JBJS*, *67*(4), 539-545.