OPEN ACCESS

GAVIN PUBLISHERS

Annals of Case Reports

Arroyo L, et al. Ann Case Report 12: 286.

DOI: 10.29011/2574-7754/100286

Case Report

Severely Displaced Epiphysiolysis of A 10-Year-Old Girl's Radial Head: About A Case and Bibliographic Review

López Arroyo*, López Salinas, Dra Medina Amador, Montes González, Zorrilla Ribot

Service of Orthopedic Surgery and Traumatology, General University Hospital of Ciudad Real, Spain

***Corresponding author:** Dr. López Arroyo, Service of Orthopedic Surgery and Traumatology, General University Hospital of Ciudad Real, Spain. Tel: +34 926 27 80 00; Email: albertolarroyo74@gmail.com

Citation: Arroyo L, Salinas L, Amador DM, González M, Ribot Z (2020) Severely Displaced Epiphysiolysis of A 10-Year-Old Girl's Radial Head: About A Case and Bibliographic Review. Ann Case Report 12: 286. DOI: 10.29011/2574-7754/100286

Received Date: 13 December, 2019; **Accepted Date:** 03 January, 2020; **Published Date:** 07 January, 2020

Abstract

The clinical case of a 10-year-old girl with severely displaced epiphysiolysis of grade IV proximal radius according to Judet's classification is presented. In view of the large displacement, open reduction was performed using the Kocher approach and internal fixation with 2 Kirschner wires. At 12 months she showed very good clinical evolution, without pain and with a complete range of mobility, although radiologically a complete physeal arrest was observed.

Introduction

Radial head fractures are most common between the ages of 9 and 10 years old. They represent 5-10% of elbow fractures in children. Treatment depends on the degree of angulation and displacement. A severely displaced fracture of the radius head is presented because of its limited experience due to its infrequency and with very few bibliographical reviews.

Clinical Case

Introducing a 10-year-old girl who arrived at the emergency room with pain in her right elbow after a fall. On examination, slight swelling in the elbow, pain on palpation and mobilization in the anterolateral elbow area were observed. It preserved mobility without joint blocks. In the simple radiological study, a displaced radial head could be seen (Figure 1). A CT scan was performed for preoperative planning. A displaced Judet grade IVb fracture was observed without contact between cortices (Figure 2). It was treated by open reduction by Kocher approach and fixation with 2 kirschner wires (Figure 3), and it was immobilized with a dorsal brachiopalmar splint at 90° in neutral position. After 4 weeks, the Kirschner wires were removed to begin the mobilization. A year later, the patient presents a preserved range of motion with a score at Mayo Elbow Performance Score (MEPS) of 100. A physeal arrest of proximal radius is observed radiographically (Figure 4).

Figure 1: antero-posterior and lateral X-ray of the right elbow. Posterior radial head to condyle (arrow).

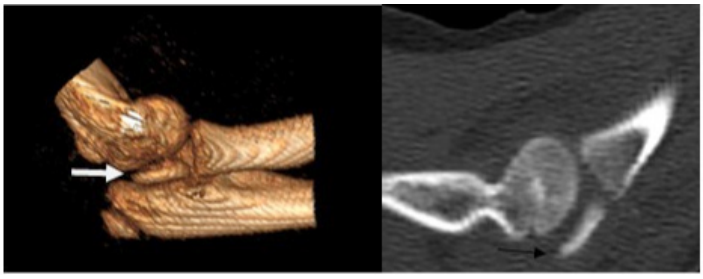

Figure 2: 3D reconstruction and CT scan (sagittal split). Displaced redial head (arrow).

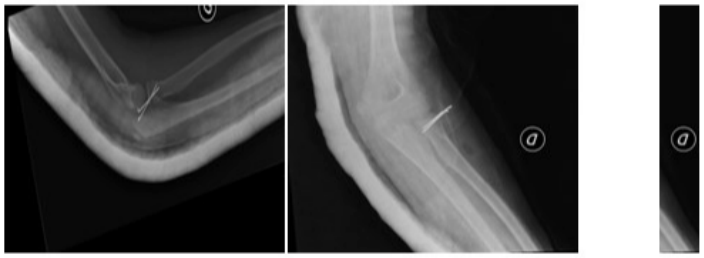

Figure 3: Postoperative anteroposterior and lateral radiographs of the right elbow. The anatomical situation of the radial head (fixed with two Kirschner wires) can be seen.

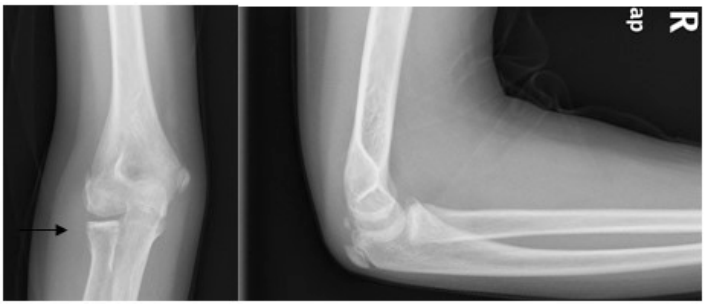

Figure 4: X-rays after 1 year of follow-up. The physeal arrest of the radial head can be seen (arrow).

Discussion

Epiphysiolysis of the radial head accounts for 1% of fractures in children and overall 5-10% of elbow pathology. They usually affect children between the ages of 9-10 with no difference in sex [1]. The injury mechanism is a fall on the hand with the arm in extension and valgus and they may be associated with other injuries such as dislocation of the elbow, olecranon and epicondyle fractures among others. The pain is accentuated with passive pronation and supination. The Greenspan radiocapitellar projection is very useful for radiological diagnosis [1]. There are different types of classifications but the most commonly used are the O'brien and Judet classifications in which the main factor to be taken into account is the degree of angulation [2, 3]. The choice of treatment is going to be focused according to the degree of angulation and displacement. In fractures with less than 30° of angulation and less than 3 mm of displacement, conservative treatment by immobilization is preferred.

In the case of angulations or major displacements, the treatment of choice will be closed reduction and immobilization [1-3]. Surgical treatment is reserved for cases where conservative treatment has failed. Among the various options we find the closed reduction with percutaneous pins using techniques such as "joystick needle" or Metaizeau technique. Results are superior in young people without other associated injuries, and if fractures show only limited dislocation. Tarallo et al published a retrospective comparative study between percutaneous fixation and elastic endomedullary nailing (Metaizeau technique), obtaining comparable radiological results with increased functionality and fewer complications in the elastic endomedullary nailing group [4]. Another option is open reduction with or without internal fixation, used mainly in fractures that cannot be adequately reduced to less than 45° with closed and percutaneous techniques.

This technique has been associated with loss of mobility and higher probability of osteonecrosis, synostosis, physial arrest and heterotopic ossification [5-7]. This is controversial because open reduction is used in more severe fractures. In fact, among others, Gutierrez de la Iglesia et al. realized a retrospective study to analyze predictive factors in functional outcomes and he obtained that there was no statistically significant association between the Mayo Elbow Performance Score (MEPS) and the type of reduction (open or closed), however he found a statistically significant association between the initial grade in the Judet classification and the MEPS [8].

A controversial aspect of Judet's classification (most frequently used) is that it does not differentiate angulations with contact between corticals from those without, especially in grade IV. With respect to the fractures mentioned above, there are no studies with sufficient level of evidence to help us perform a clear algorithm of treatment due mainly to the small amount of them. Kaiser et al. in a retrospective study compared grade IV fractures with cortical contact (A) and fractures without cortical contact (B), obtaining a higher rate of complications, open reduction and worse functional results in group B, concluding that the main cause of unfavourable results is related to the degree of energy of the trauma and displacement, and not to the type of reduction (open or closed) [1].

In this case, we presented a severely displaced and angled fracture, without contact between corticals, taken to the posterior zone of the humeral condyle, corresponding according to Judet's classification of a type IVb. The literature does not offer great data as to which type of treatment is better depending on the degree of displacement, but considering closed reduction impossible, it was decided to open reduction and fixation with 2 transfisary kischner needles. At 12 months the patient is clinically asymptomatic without any limitation to mobility. From the radiographic point of view, however, there is a secondary growth plate close.

Conclusion

The main factor in functional results is not the type of open or closed reduction but the degree of displacement. Open reduction is the treatment of choice in severe non-contact displacements. In these cases, the use of CT scans is recommended for good preoperative planning.

References

1. Margarita K, Robert E, Christoph C, Tanja K, Holger T, et al. (2016) Judet type-IV radial neck fractures in children. Comparison of the outcome of fractures with and without bony contact. Acta Orthopaedica 87: 529-532.

2. Al-Aubaidi Z, Pedersen NW, Nielsen KD (2012) Radial neck fractures in children treated with the centromedullary Metaizeau technique. Injury 43: 301-305.

3. De Mattos CB, Ramski DE, Kushare IV, Angsanuntsukh C, Flynn J M (2016) Radial neck fractures in children and adolescents: An examination of operative and nonoperative oreatment and Outcomes. J Pediatr Orthop 36: 6-12.

4. Luigi T, Raffaele M, Francesco F, Francesco, Fabio C (2013) Management of displaced radial neck fractures in children: percutaneous pinning vs. elastic stable intramedullary nailing. J Orthopaed Traumatol 14: 291-297.

5. Newman JH (1977) Displaced radial neck fractures in children. Injury 9: 114-121.

6. Ursei M, Sales de Gazuzy J, Knorr J, Abid A, Darodes P, et al. (2006) Surgical treatment of radial neck fractures in children by intramedullary pinning. Acta Ortho Belg 72: 131-137.

7. D´souza S, Vaishya R, Klenerman L (1993) Management of radial neck fractures in children: a retrospective analysis of one hundred patients. J Pediatr Orthop 13: 232-238.

8. Diego G, Laura P, Marisa C, Jorge K (2017) Surgical Techniques for Displaced Radial Neck Fractures: Predictive Factors of Functional Results. Journal of Pediatric Orthopaedics 37: 159-165.