



# Revista Española de Cirugía Ortopédica y Traumatología

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## LETTERS TO THE EDITOR

### Fractures of the proximal end of the radius in children<sup>☆</sup>

#### Fractura de la extremidad proximal de radio en niños

To the Editor,

Issue 4/2012 of "Revista Española de Cirugía Ortopédica y Traumatología" (Spanish Journal of Traumatology and Orthopaedic Surgery) included the article "Radial head and neck fractures in children" by Fuentes Salguero et al.<sup>1</sup> In it, the authors concluded that the management of these lesions should be staggered, placement of transcapsular needles and excision of the radial head should be avoided and that the most common complication is loss of pronosupination. Firstly, we wish to congratulate the authors for their work and for delving into a topic which generates much debate in the field of paediatric traumatology, given that there are multiple ways to treat these injuries. After reading this interesting article we would like make the following comments:

The proportion of associated fractures published in their series, reaching up to 66.6%, was significant. This percentage was significantly lower in other works, such as that by Vocke et al.<sup>2</sup> (42%) or that by González-Herranz et al.<sup>3</sup> (23%), although the literature contains reports of associations with other fractures in up to 50% of cases. Being a short series, this suggests that either the number of cases included in the study were those which required special attention due to being multiple injuries, or else that the other associated lesions were more severe, thus leading to a bias in the percentage.

Regarding the Steel-Graham classification used for their cases (Group I: 12; Group II: 3; Group III: 3; Group IV: 3), we should highlight the considerable percentage of fractures with hardly any displacement or with angulation under 30° (57.6%) in which the authors did not specify the complication rate according to the severity of displacement.

The vast majority of authors link successful results with achieving a good reduction by closed methods (manual reduction, Feray or Metaizeau method). The authors of this

work did not mention whether the complications observed were related to cases requiring open reduction or those treated in a closed manner in which adequate reduction was not achieved. Eleven of their patients were treated conservatively with immobilisation and without any manipulation, but they did not specify the method or period of immobilisation. Evans and Graham<sup>4</sup> established a period of 3 weeks for fracture healing, as well as to avoid complications in terms of joint stiffness.

There was no reference to complications recorded among the group of patients treated surgically (4 cases through percutaneous reduction and 6 through open reduction). In such cases, a table recording this type of incidences would be advisable.

According to different authors, open reduction should be avoided whenever possible due to the high frequency of severe complications, such as avascular necrosis of the radial head, radioulnar synostosis or significant limitations in elbow mobility. Works such as that by D'Souza et al.,<sup>5</sup> report using open reduction only after failing to achieve an adequate closed reduction. Meanwhile, Evans and Graham<sup>4</sup> recommend open reduction for Steel-Graham type IV fractures. González-Herranz et al.<sup>3</sup> reserve open reduction for irreducible fractures, cases of displaced Salter-Harris type III or IV epiphysiolysis or for incarcerated intraarticular fragments in which closed methods fail. In a series comparing open and closed reductions for displaced fractures,<sup>6</sup> these same authors observed good results with noninvasive methods in 95% of cases. However, good results were only obtained in 52% of cases when conducting open reduction. These figures were similar to others in the published literature.

Lastly, the authors did not offer specific details regarding the postoperative management of these lesions: period of immobilisation, need for rehabilitative treatment and its effectiveness and duration, and the time and manner in which the osteosynthesis material was removed.

As a recommendation, we believe that a table of cases, including their classification, treatment, complications and mobility deficit, would bring added clarity to an otherwise excellent work.

### Ethical responsibilities

**Protection of people and animals.** The authors declare that this investigation did not require experiments on humans or animals.

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**Confidentiality of data.** The authors declare that this study does not reflect any patient data.

**Right to privacy and informed consent.** The authors declare that this study does not reflect any patient data.

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## References

1. Fuentes Salguero L, Downey-Carmona FJ, Tatay-Díaz A, Moreno-Domínguez R, Farrington-Rueda DM, Macías-Moreno ME, et al. Fracturas pediátricas de cabeza y cuello de radio. *Rev Esp Ortop Traumatol.* 2012;56:300–5.
2. Vocke AK, Von Laer LR. Displaced fractures of the radial neck in children: long-term and prognosis of conservative treatment. *J Pediatr Orthop.* 1998;7:217–22.
3. González-Herranz P, Álvarez-Romera A, Burgos J, Rapariz JM, Hevia E. Displaced radial neck fractures in children treated by

- closed intramedullary pinning (Metaizeau technique). *J Pediatr Orthop.* 1997;17:325–31.
4. Evans MC, Graham HK. Radial neck fractures in children: a management algorithm. *J Pediatr Orthop.* 1999;8:93–9.
  5. D'Souza S, Vaishya R, Klenerman L. Management of radial neck fractures in children: a retrospective analysis of one hundred patients. *J Pediatr Orthop.* 1993;3:232–8.
  6. González-Herranz P, López Mondéjar JA, Burgos Flores J, Ocete Guzmán G, Rapariz González JM, Pérez Aguilar D. Epifisiólisis desplazadas de la cabeza radial. Revisión de 42 casos. *Rev Ortop Traumatol.* 1990;34-IB:641–4.

D. Domínguez Lorenzo<sup>a,\*</sup>, P. González-Herranz<sup>a</sup>,  
M. Plata García<sup>b</sup>

<sup>a</sup> *Unidad de Cirugía Ortopédica y Traumatología Infantil, Complejo Hospitalario Universitario A Coruña, A Coruña, Spain*

<sup>b</sup> *Unidad de Cirugía Ortopédica y Traumatología Infantil, Hospital Clínico Universitario de Valladolid, Spain*

\* Corresponding author.

*E-mail address:* [danieldominguez85@gmail.com](mailto:danieldominguez85@gmail.com)  
(D. Domínguez Lorenzo).

## Reply to the letter related to the article "Radial head and neck fractures in children"<sup>☆</sup>

### Repuesta a la carta al director acerca del artículo «Fracturas pediátricas de cabeza y cuello de radio»

Firstly, we wish to thank the author/s of the letter for their detailed reading of our article and also for their understanding in this controversial issue within child traumatology; we will attempt to answer the questions raised.

There has not been any bias regarding associated fractures. A search request was submitted to the hospital archive, yielding 42 medical histories, of which only 21 were valid for the study (19 had a wrongly coded diagnosis – the majority were distal radial fractures –, and 2 histories were not included because they could not be located). Twelve cases (57%) presented an ipsilateral elbow lesion (6 in the proximal or medial ulna, 5 in the olecranon and 1 in the trochlea) and 3 patients (14.2%) associated lesions in a different location.

Conservative treatment consisted of a brachio-palmar plaster splint, with the elbow at 90°, the forearm in intermediate supination and the wrist in a functional position, for a mean period of 3 weeks.

Regarding rehabilitation, 10 patients did not require it since they presented full mobility. Of the 11 patients

who required rehabilitation, 3 recovered full mobility. The mean period to achieve full mobility, or the highest degree of mobility among those who suffered some deficit, was 4.71 months, with a mean duration of physical therapy of 3 months.

Six cases were initially treated by open reduction and 1 more case after secondary displacement in a patient treated by percutaneous reduction. Of these 7 patients, 4 suffered no complications and progressed to full joint balance. The remaining 3 suffered complications such as: loss of mobility in supination in all 3 cases, 2 cases with neuropraxia of the posterior interosseous (1 iatrogenic) and 1 case with myositis ossificans. The patient reoperated for displacement after percutaneous reduction presented valgus elbow and avascular necrosis.

The 2 cases of avascular necrosis occurred among patients with grade I fractures in the Steele-Graham classification, but with grade E in the Chambers classification, that is, associated with elbow dislocation (both cases involved Monteggia injuries).

Postoperative management consisted in immobilisation using a brachio-palmar splint for a period ranging between 4 and 5 weeks. The osteosynthesis material was removed under general anaesthesia at the same time as the splint (except in the case treated by the Feray technique, which took place on an outpatient basis). All intervened patients were evaluated by the rehabilitation service, with a treatment period of approximately 3 months.

L. Fuentes-Salguero

*Ortopedia Infantil, Hospital de la Serranía, Ronda, Málaga, Spain*

*E-mail address:* [dr.fuentes82@hotmail.com](mailto:dr.fuentes82@hotmail.com)

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