Advantages and disadvantages of the prone position in the surgical treatment of supracondylar humerus fractures in children. A literature review.

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Abstract

INTRODUCTION:
Supracondylar humerus fractures are the most common elbow injuries in children. The widely adopted approach for Gartland III extension type consists of closed reduction and percutaneous pinning; the pin configuration can be lateral or crossed in relationship with the habit of the surgeons. Iatrogenic injury of the ulnar nerve is the most common risk during the insertion of the medial pin. The aim of this study was to analyze advantages and disadvantages of percutaneous pinning with the patient in prone position.

MATERIALS AND METHODS:
A literature review of the period 2005-2017 was carried out; four medical search engine (Pubmed, Cochrane Library, ISI Web of Science and Scopus) were consulted using the review's filter and the key words “Ulnar nerve AND supracondylar humerus fractures”. The total number of patients were analyzed for: ulnar nerve injuries, anesthesiologic management, time of surgery.

RESULTS:
Twenty-nine papers were read, 23 regarding cross pinning in supine position and 6 in prone position. On one hand, 1529 children were treated with closed reduction and cross pinning in supine position; 69 of these patients (4.5%) suffered from iatrogenic ulnar nerve injury. On the other hand, 579 patients underwent the same treatment in prone position; no ulnar nerve lesions were reported in this group. Only one article compared both groups of children in supine and prone position regarding time of anesthesia which is slightly higher in the prone group. There were no differences between supine and prone positions regarding x-ray exposition, time of surgery, closed reduction manoeuvres, pin positioning, x-ray results, clinical and functional results.

DISCUSSION AND CONCLUSIONS:
The ulnar nerve in children is hypermobile in the cubital tunnel and tends to dislocate anteriorly over the medial epicondyle, especially when the elbow is in hyperflexion. This may be the reason of the increased risk of nerve injury during the insertion of the medial pin in supine position and, instead, an advantage of the prone position. The insertion of both pins from the lateral side could reduce this complication. Larger studies need to be carried out regarding the reported higher duration of anesthesia in prone position.

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KEYWORDS:
Children; Humerus; Pediatric fractures; Percutaneous pinning; Prone position; Supine position; Supracondylar fracture; Ulnar nerve injury.