

Ulna osteotomy for surgical correction of neglected Monteggia fracture in a child with ulna bowing.

Case report

Osteotomia da ulna para correção cirúrgica de fratura de Monteggia negligenciada em criança com deformidade plástica da ulna. Relato de caso

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Abstract

Introduction: Dislocation of the radial head with ulna bowing, when combined, constitutes a rare condition, and often missed diagnosed. **Objective:** Report a case of neglected Monteggia fracture in a child with ulna bowing, treated surgically with reduction and fixation of the radial head, without reconstruction of the annular ligament, and osteotomy of the ulna. **Case Report:** A 6-year-old male patient, victim of falling to the ground, was admitted to the Emergency Department with complaints of pain in his right elbow. The patient was submitted to radiographic exams of the elbow, interpreted by the physician as normal. Two weeks later, the patient returned with pain, and radiographic exams of the forearm showed the presence of ulna bowing associated with dislocation of the radial head. As a treatment, we opted for open reduction and fixation of the radial head with metallic wires, associated with flexion osteotomy of the ulna. It evolved in the postoperative period with consolidation of the osteotomy, maintenance of the reduction of the radial head, and recovery of the total range of motion of the elbow and forearm. **Conclusion:** Pediatric patients who present with pain in the elbow, due to a fall, should be thoroughly evaluated for the possibility of ulna bowing associated with dislocation of the radial head. Ulna osteotomy with fixation of the radial head, without reconstruction of the annular ligament, brought good results in the treatment of neglected Monteggia fracture in a child with ulna bowing.

Keywords: Monteggia fracture, Ulna/deformities, Ulna fractures, Osteotomy, Trauma, Child, Pediatrics

Resumo

Introdução: A luxação da cabeça do rádio com deformidade plástica da ulna, quando combinadas, configuram uma condição rara, e frequentemente não diagnosticada na urgência. **Objetivo:** Relatar um caso de fratura de Monteggia negligenciada em criança com deformidade plástica da ulna, tratada cirurgicamente com redução e fixação da cabeça do rádio, sem reconstrução do ligamento anular, e osteotomia da ulna. **Relato do Caso:** Paciente de 6 anos de idade, sexo masculino, vítima de queda ao solo com a mão espalmada, deu entrada em Unidade de Pronto Atendimento com queixa de dor no cotovelo direito. Paciente foi submetido à exames de imagem radiográficos do cotovelo interpretados pelo examinador como sem alterações. Duas semanas após, o paciente retornou mantendo dor, e foram solicitados exames de radiografia do antebraço, que evidenciaram presença de deformidade plástica da ulna associada à luxação da cabeça do rádio. Como tratamento, optou-se pela redução aberta e fixação da cabeça do rádio com fios metálicos, associado a osteotomia de flexão da ulna fixada com fio de Kirschner. Evoluiu no pós operatório com consolidação da osteotomia, manutenção da redução da cabeça do rádio, e recuperação do arco de movimento total do cotovelo e antebraço. **Conclusão:** Pacientes pediátricos que se apresentam com dor no cotovelo, em decorrência de queda com a mão espalmada, devem ser minuciosamente avaliados quanto à possibilidade de deformidade plástica da ulna associada à luxação da cabeça do rádio. A osteotomia na ulna com fixação da cabeça do rádio, sem reconstrução do ligamento anular, trouxe bom resultado no tratamento de fratura de Monteggia negligenciada em criança com deformidade plástica da ulna.

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Palavras chave: Fratura de Monteggia, Ulna/deformidades, Fraturas da ulna, Osteotomia, Trauma, Criança, Pediatria

Introduction

Monteggia fractures account for about 1% of all forearm fractures in children⁽¹⁾. However, this diagnosis is often overlooked in initial care. It is estimated that around 25 to 50% of these injuries, radial head dislocation is not diagnosed in the first appointment⁽¹⁾. This scenario can lead to persistent pain and limited range of motion, especially in pronation and supination. On the other hand, we must always doubt the diagnosis of isolated post-traumatic radial head dislocation in children, since they are often associated with ulna bowing, which makes their diagnosis even more difficult⁽²⁾. Dislocation of the radial head with ulna bowing, when combined, is a rare condition, often not diagnosed in an emergency⁽³⁾. We report a case of neglected Monteggia fracture in a child with ulna bowing, surgically treated with reduction and fixation of the radial head and ulnar osteotomy.

Case Report

The report was duly submitted to the Ethics Committee with approval - CAAE: 46119021.0.0000.5479 – approval number 4.706.182 – Irmandade da Santa Casa de Misericórdia de São Paulo.

A 6-year-old male patient, victim of a fall to the ground with his open hand, was admitted to the Emergency Care Unit complaining of pain in his right elbow. On physical examination, he had moderate edema at the topography of the right elbow, painful passive flexion-extension and pronation-supination, and neurovascular examination without alterations. After intravenous analgesia, the patient underwent radiographic imaging of the elbow (Figure 1), which the examiner interpreted as having no alterations. It was decided to keep the limb in axillary-palmar plas-



Figure 1 - Initial radiographs of the patient's elbow. Interpreted as normal, but already showing signs of anterior dislocation of the radial head with loss of the normal radiocapitellar relationship, despite not having been performed with an absolute profile of the elbow, which makes the assessment difficult.

tered immobilization for analgesia for one week, and reassessment if necessary.

Two weeks later, the patient returned with pain, which worsened mainly for pronation-supination. At this time, bilateral forearm radiography exams were requested, which showed the presence of ulna bowing with dislocation of the radial head (Figure 2).

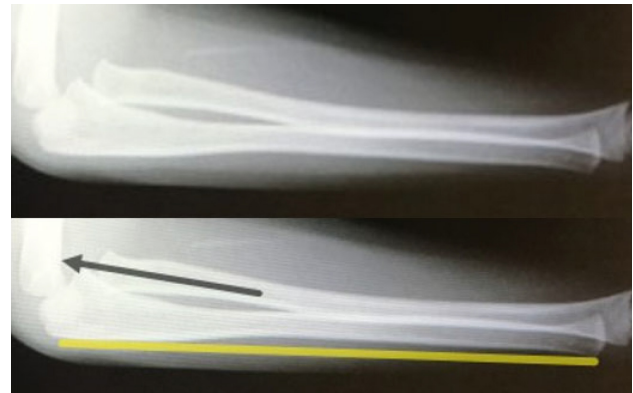


Figure 2 - Forearm radiographs two weeks after trauma. In the upper image we see the radiograph itself, and in the lower one, the arrow indicates the presence of dislocation of the radial head, and the line shows the ulna bowing.

As treatment, we opted for open reduction and fixation of the radius head with metallic wires, associated with flexion osteotomy of the ulna fixed with Kirschner wire (Figure 3). The patient was maintained postoperatively with plaster cast immobilization for six weeks, when radiographs showed osteotomy



Figura 3 - Radiographs of the elbow and forearm, the upper image showing the immediate postoperative period of reduction and fixation of the radial head with metal wires, and fixation of the ulnar osteotomy with Kirschner wire. The image down shows consolidation of the ulnar osteotomy and maintenance of the radial head position after removal of synthesis material.

consolidation and maintenance of radial head reduction. With only four sessions of physiotherapy, the patient had a full range of motion.

Discussion

In cases of pediatric trauma associated with falls with the extended hand and elbow pain, patients usually refuse to move the joint, maintaining an attitude of discreet flexion and pronation⁽³⁾. This makes it difficult to obtain good radiographic images, respecting the front and profile views, and contributes to diagnostic failure in the initial evaluation⁽³⁾. In the present report, such evolution is observed, the initial radiographs of the patient were not taken in absolute profile of the elbow, which makes the diagnosis of radial head dislocation difficult.

In this scenario, radiographs of the forearm are extremely valuable. Lincoln et al⁽²⁾, described a radiographic landmark called "ulnar arch sign" (Figure 4). In it, if the posterior edge of the ulna, in the radiographic view of the forearm in profile, is deviated above 0.01mm from a straight line between the extremities, the picture of ulna bowing associated with dislocation or subluxation of the radial head should be suggested.

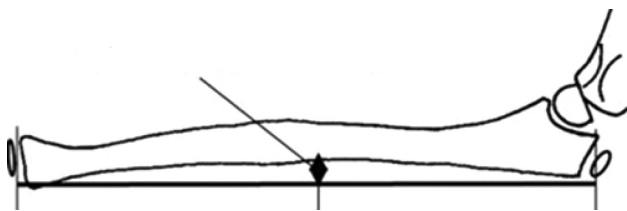


Figure 4 - Drawing taken from the original study by Lincoln et al. ⁽²⁾ Observe the ulnar arch sign from a distance greater than 0.01 mm from the posterior edge of the ulna in relation to the straight line drawn.

Kenneth et al.⁽⁴⁾ reinforces the importance of promoting a careful assessment of the radiocapitellar alignment in radiographs of pediatric patients with painful elbows. If present, and the presence of a fracture in the ulna is observed, the classic picture of Monteggia should be considered. Our patient had an anterior dislocation of the radial head with deformity of the ulna with an anterior apex, which configures type 1 Monteggia, the most common type in pediatric patients⁽⁵⁻⁸⁾.

As therapy, in the acute phase, the treatment of choice is based on closed reduction of the dislocation and fracture under sedation and immobilization for approximately 4 weeks. In chronic cases, several techniques are described, with the possibility of open reduction and fixation of the radial head, with or without reconstruction of the annular ligament;

associated with ulnar osteotomy, in the diaphyseal or metaphyseal portion, promoting its flexion ^(1,9-10). Goyal et al⁽¹⁾, in a systematic review, points to ulnar osteotomy as the central aspect of the treatment, with a predilection for its performance in the proximal metaphyseal region, given its greater capacity for correction and potential for consolidation. The same study points out that the reconstruction of the annular ligament is associated with a lower range of motion gain. We performed an osteotomy in the ulna in our patient with fixation of the radial head without reconstruction of the annular ligament, and we had good evolution, with consolidation of the osteotomy and functional recovery of the forearm and elbow after rehabilitation.

As the main complications for the pediatric Monteggia condition, we highlight the recurrence of radial head subluxation, loss of pronation, radioulnar synostosis and injury to the posterior interosseous nerve^(1,11). In our case, we did not observe any of these complications, with the patient having been in outpatient follow-up for more than six months, with full range of motion and without functional limitations.

Conclusion

Pediatric patients who present with elbow pain as a result of a fall should be carefully evaluated for the possibility of ulna bowing associated with radial head dislocation. Ulna osteotomy with fixation of the radial head without reconstruction of the annular ligament brought good results in the treatment of neglected Monteggia fractures in a child with ulna bowing.

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