

Combined Medial and Lateral Condyle Elbow Fractures in a 3-Year-Old Boy

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Abstract

We present a rare elbow fracture pattern in a 3-year-old boy who sustained concomitant medial and lateral elbow condyle fractures. The lateral condyle fracture was not initially appreciated on standard anteroposterior and lateral radiographs and was demonstrated best on oblique view. The patient underwent open reduction and internal fixation of both medial and lateral condyles that resulted in uneventful healing. This underlines the importance of obtaining oblique views of the elbow when diagnosing a complex elbow fracture in the skeletally immature patient.

AT-condylar elbow fracture in the skeletally immature population is an extremely rare injury, especially in the very young age group. Beghin and colleagues¹ described 2 cases of children less than 4 years old who sustained this type of elbow fracture that is usually seen in adults. Even in the adolescent age group, the fracture pattern is very uncommon.²⁻⁷

We present a case report of a 3-year-old boy who was initially thought to have an isolated medial condyle fracture based on anteroposterior and lateral radiographs. An oblique radiograph revealed a T-condylar fracture pattern. The additional lateral condyle involvement was appreciated and confirmed during surgery. The authors have obtained written informed consent from the patient's parent for both print and electronic publication of the case report and all its components.

CASE REPORT

A 3-year-old boy fell from his bed and immediately experienced pain and swelling in the left elbow. His mother

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saw the fall and noted his arm was behind his back as he fell and he landed on his outstretched hand. He presented to an outside emergency room and was seen at the authors' facility 2 days later for management. Physical examination showed diffuse swelling about the elbow with ecchymosis anteromedially. Palpation both medially and laterally elicited pain. The patient had no neurological or vascular abnormalities.

Plain radiographs were taken. Anteroposterior (AP), lateral, and oblique radiographs are shown in Figure 1A-C. The AP radiograph does not clearly show the lateral condyle fracture. The lateral radiograph shows

“Oblique radiographs are essential when evaluating an elbow clinically suspected of having a bicondylar elbow fracture.”

a large posterior fragment, but it is unclear from this view whether this fragment represents the medial or lateral condyle fracture. The oblique radiograph most visibly demonstrates both fractures with a single midline intercondylar split occurring at the capitulo-trochlear groove. However, at the time of the initial evaluation, the lateral condyle fracture was not fully appreciated, and the patient was scheduled for operative reduction and fixation of the medial condyle fracture.

Under anesthesia, an attempt at closed reduction was performed, but was unsuccessful. Therefore, the patient underwent open reduction of the medial condyle. An incision was made over the medial aspect of the elbow.



Figure 1. Preoperative (A) anteroposterior (AP), (B) lateral, and (C) oblique radiographs of the elbow in a 3-year-old boy. The AP view shows posterior displacement of the fractures. The oblique view best demonstrates the lateral condyle displacement.

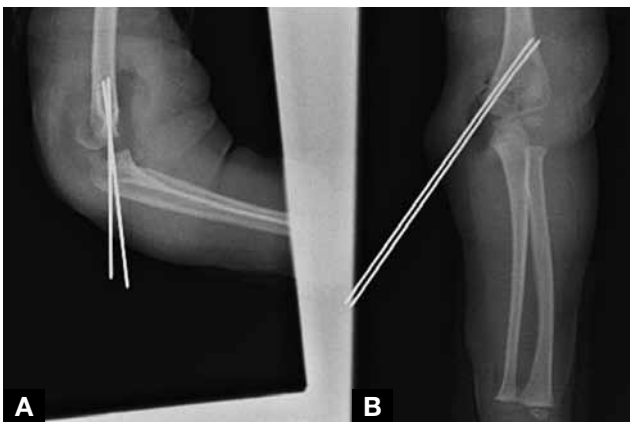


Figure 2. Initial intraoperative (A) lateral and (B) anteroposterior (AP) radiographs. These radiographs were taken after open reduction and internal fixation of the medial condyle fracture. The lateral view clearly shows the posteriorly displaced lateral condyle fracture that remains displaced. The AP view shows the fracture but underestimates the displacement.

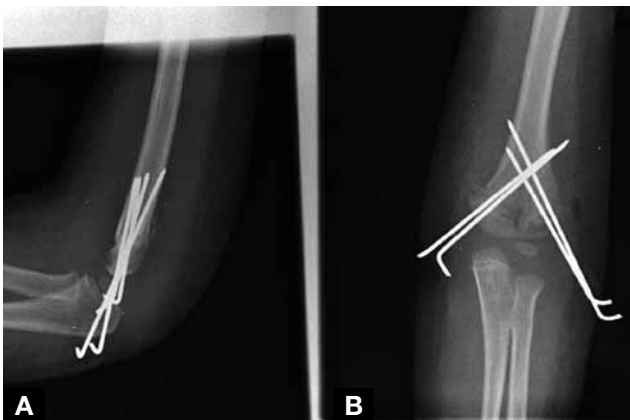


Figure 3. Final intraoperative (A) lateral and (B) anteroposterior radiographs show fixation of both the medial and lateral condyle fragments.

The ulnar nerve was identified and protected at all times without the need for transposition. Initial inspection showed that the fragment was translated proximally and rotated such that the articular surface was slightly posterior, as was expected owing to the pull of the forearm flexor muscles.⁸ The fracture was reduced and two 0.062-inch Kirschner wires (K-wires) were placed.

An intraoperative AP radiograph showed anatomic reduction of the medial side with no clear evidence of a fracture laterally. The lateral radiograph showed persistence of the unreduced fragment posteriorly as compared with the preoperative radiograph (Figures 2A, 2B). At this point, closer review of the preoperative oblique radiograph revealed the lateral condyle fracture. The diagnosis of a T-condylar (both condyles) pattern was now apparent. The lateral condyle fragment was displaced only in the sagittal plane. Adequate visualization of the lateral joint line could not be achieved through the medial incision; therefore, a separate incision was made laterally. The fragment



Figure 4. Follow-up (A) anteroposterior and (B) lateral radiographs obtained at the time of pin removal show the fracture well healed and adequately aligned.

was rotated posteriorly, similar to the medial side. The fracture was reduced and two 0.062-inch K-wires were placed. Postoperative radiographs showed anatomic reduction (Figures 3A, 3B). The pins were bent and left protruding through the skin on both medial and lateral sides.

One week after surgery the patient was changed from a splint to a long arm cast.

Three weeks after surgery, radiographs revealed abundant callus both medially and laterally. All pins were pulled in the clinic. Casting was discontinued, and the arm was placed into a removable long arm posterior splint to facilitate periodic supervised active range of motion exercises. Six weeks after surgery, radiographs continued to show excellent alignment and interim bony healing (Figure 4). Elbow range of motion was approximately -20° to 120° . The patient was referred to outpatient physical therapy, which resulted in full painless range of motion of the elbow. Twelve weeks after surgery, he continued to do well clinically.

DISCUSSION

Because T-condylar elbow fractures are rare in children, a paucity of information is available in the literature. Clinically, the current case exhibited significant soft-tissue swelling and ecchymosis that seemed out of proportion to the bony injury seen on radiographs, suggesting that greater force is required to produce this pattern compared with a more common supracondylar humerus fracture. The medial and lateral columns are broader in cross-section than that of the supracondylar region, also suggesting that substantial force is needed to fracture the thicker bone.

The authors failed to appreciate the lateral condyle fracture on the initial radiographs; its presence was an intraoperative finding. However, upon closer review of the oblique radiograph, the lateral condyle fracture becomes evident. The only clinical sign of injury laterally was tenderness, although subjective examination of

the young child was difficult. Meyer and Lyon⁹ stated that lateral elbow ecchymosis is a reliable clinical sign of an occult lateral condyle fracture. In this case, lateral ecchymosis was not present.

Open reduction and internal fixation has been the mainstay of treatment for elbow condyle fractures in older children and adolescents. Bryan and Morrey triceps-sparing approach, olecranon osteotomy, and triceps-splitting approach have been used by various authors with good results in terms of exposure, reduction, and postoperative rehabilitation.^{3,5,6} We chose to make separate small medial and lateral incisions over the epicondyles. Even in retrospect we recommend 2 separate incisions for treatment of this injury in children. The 2 incisions allowed adequate inspection of the joint surface and anterior distal humerus. If the 2 condyles are widely displaced and recognized preoperatively, a single posterior approach may be preferable. The thick periosteum and elastic articular cartilage probably prevented wide displacement of the fracture; therefore, extensive soft-tissue dissection was not needed to mobilize the fragments and gain anatomic reduction. Both sides were fixed with K-wires that were left percutaneously.

In this case, the fractures healed in anatomic alignment and full painless range of motion was restored. Patients are not routinely followed long term and parents are given instructions on elbow inspection for cubitus varus and cubitus valgus and to return should any of these conditions develop. Our short-term follow-up is a limitation of this study.

Oblique radiographs are essential when evaluating an elbow clinically suspected of having a bicondylar elbow fracture. The two-incision technique allows good

exposure and reduction of the fracture. Percutaneous K-wires appear to be a stable construct for fixation. It is important to anticipate soft-tissue swelling with this fracture and leave percutaneous pins prominent to facilitate easy removal. Parents need to be thoroughly counseled regarding the severity of the injury and the possibility for future growth disturbances and angular deformities, especially considering the growth potential in this very young age group.

AUTHORS' DISCLOSURE STATEMENT

The authors report no actual or potential conflict of interest in relation to this article.

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This paper will be judged for the Resident Writer's Award.
