

A 7-year-old boy was brought to the emergency department after falling onto his outstretched arm. He complains of pain in his left arm and refuses to move his arm at the elbow. On examination, the left arm is swollen, slightly pale, and edematous. His radial pulse is intact. The patient's radiograph is shown below.



While the patient is waiting for the orthopedic resident on call to examine him, he continues to complain of increasing pain despite multiple doses of pain medication. Which of the following should you be most concerned about in this patient?

- ☐ A. Displacement of the fracture
- ☐ B. Transient neuropraxia
- ☐ C. Brachial artery injury
- ☐ D. Compartment syndrome
- ☐ E. Narcotic abuse

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- ☐ A. Displacement of the fracture [6%]
- ☐ B. Transient neuropraxia [5%]
- ☐ C. Brachial artery injury [16%]
- ☒ D. Compartment syndrome [72%]
- ☐ E. Narcotic abuse [1%]

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Explanation:

User Id: [REDACTED]

Elbow fractures account for over half of all fractures in children, and the most common type is a supracondylar humerus fracture. These injuries occur most commonly in children ages 2-12 years old. The typical history usually consists of a fall onto an outstretched arm with the elbow extended. Radiographs often show a large or triangular anterior fat pad (lucency) and the presence of a posterior fat pad (lucency) sign.



Due to its location, supracondylar humerus fractures may be complicated by neurovascular injury or compartment syndrome. Compartment syndrome is characterized by severe pain, pallor, poikilothermia, paresthesias, and the late findings of pulselessness and paralysis. Patients with predisposing injuries should be continually monitored for the development of compartment syndrome, particularly as swelling from the injury increases. Initial treatment includes removal of any bandages, measurement of compartment pressures, and emergent orthopedic evaluation for possible fasciotomy.

(Choice A) Displacement of the fracture is an unlikely cause of this patient's increased pain since the radiograph shows no displacement and the patient is refusing to move the extremity.

(Choice B) Transient neuropraxias are very common in patients with supracondylar humerus fractures, but would not cause increasing pain.

(Choice C) Brachial artery injury is a major concern in patients with supracondylar humerus fractures due to their location. Therefore, pulses should be monitored frequently to determine if vascular injury has occurred. Manipulation of the fracture



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(Choice A) Displacement of the fracture is an unlikely cause of this patient's increased pain since the radiograph shows no displacement and the patient is refusing to move the extremity.

(Choice B) Transient neuropraxias are very common in patients with supracondylar humerus fractures, but would not cause increasing pain.

(Choice C) Brachial artery injury is a major concern in patients with supracondylar humerus fractures due to their location. Therefore, pulses should be monitored frequently to determine if vascular injury has occurred. Manipulation of the fracture should only be done by a specialist to avoid causing vascular injury during fracture reduction. In this patient, the pulses are intact and he is having increasing pain, which is more concerning for compartment syndrome than vascular injury.

(Choice E) Narcotic abuse is unlikely in a child this age, and the increasing pain from swelling due to compartment syndrome is the more likely reason that he is requiring multiple doses of pain medication.

Educational objective:

Compartment syndrome can be a complication of supracondylar humerus fractures. It is characterized by severe pain, pallor, poikilothermia, paresthesias, and the late findings of pulselessness and paralysis.