"What was I thinking?"

By Sam G. Campbell, MB BCh, CCFP(EM); Pat Croskerry, MD, PhD, CCFP(EM); and Jiri Dubec, MD, CCFP

At a ski hill with your four-year-old son, you are skating to the lift, dragging him behind you with a ski pole, when he has a bad fall. He complains of pain in his left forearm and won't let you examine him. Earlier that year, the boy had suffered a torus fracture in that same arm after a fall. Presuming a re-fracture, you take him to the local emergency department (ED), where X-rays appear normal (Figure 1). The physician diagnoses a "sprain," gently puts the arm in a sling, and prescribes analgesics.

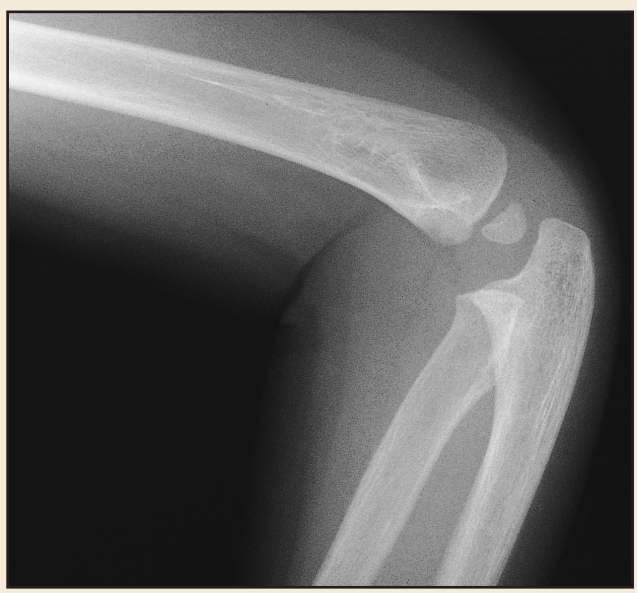

Figure 1. Normal X-ray.

Questions:

1. **What common injury are you both forgetting to consider?**
2. **What can you do about it?**
3. **How can you be sure it isn't something more serious?**
4. **Why did you make this common diagnostic error?**

Answers:

1. What common injury are you both forgetting to consider?

Radial head subluxation, or "nursemaid's elbow" is a common injury in children between two and four. It usually follows traction along the long axis of the arm. It can occur when someone tries to break the fall of a child while holding his hand, when helping the child over a step by pulling up on his hand, or by swinging a child by the arms. The annular ligament, which encircles the radial head and anchors it to the ulna while allowing radial rotation, slips off the head and gets stuck in the joint between the radial head and distal humerus. Because the radial head is not actually dislocated, X-rays are usually normal; radial head subluxation is a clinical diagnosis. The child will usually hold his arm in five to 10 degrees of flexion, with the hand pronated, and the arm supported by the other hand and/or held in adduction. He will resist any attempt to move the joint, but is often comfortable without motion.

2. What can you do about it?

In many cases, children will reduce the injury with their own movement (in which case they will be pain-free by the time you see them). If not, reduction can be very easily achieved using the hand on the same side as the injured elbow (*i.e.*, right hand for right elbow), by quickly and simultaneously

supinating (externally rotating) the hand while flexing the elbow (Figure 2). If you place the thumb of your other hand on the radial head, you will often feel a small "click." Pressure on the radial head may actually assist in reduction. The child will cry out briefly, but pain relief is rapid, making analgesia unnecessary.

After the procedure, leave the child alone to play. You should soon observe him using the arm without pain. Occasionally, after a prolonged period of subluxation, reduction may be more difficult. The longer the time between injury and reduction, the more the chance of mild, persistent pain. Immobilization after reduction is not necessary unless pain persists, in which case a posterior splint or sling can be used, with re-evaluation in 24 hours. Except in cases where alternate diagnoses are strongly suspected, X-rays are not indicated.

The injury does tend to recur, so in addition to explaining how to avoid a recurrence, parents can be taught to do the reduction themselves. The child will grow out of it; nursemaid's elbow is rare after the age of five.

3. How can you be sure it isn't something more serious?

The clinical appearance is usually typical, and rapid reduction (before allowing the child time to get more anxious) usually confirms the diagnosis. Absence of the typical history is common, but should prompt consideration of other injuries, as should any bruising, swelling, deformity, crepitation, redness, or fever. Tenderness is usually confined to the radiohumeral joint. If in doubt, do an X-ray. Flaccid paralysis of the arm suggests brachial plexus injury.

4. Why did you make this common diagnostic error?

Diagnostic errors may simply be due to a lack of knowledge, but are often due to biases in thinking. In many situations, physicians have particular cognitive dispositions to respond (CDRs) to clinical problems. It is difficult to know exactly what people are thinking when they are making clinical diagnoses, but in hindsight, several CDRs are possible in this case:

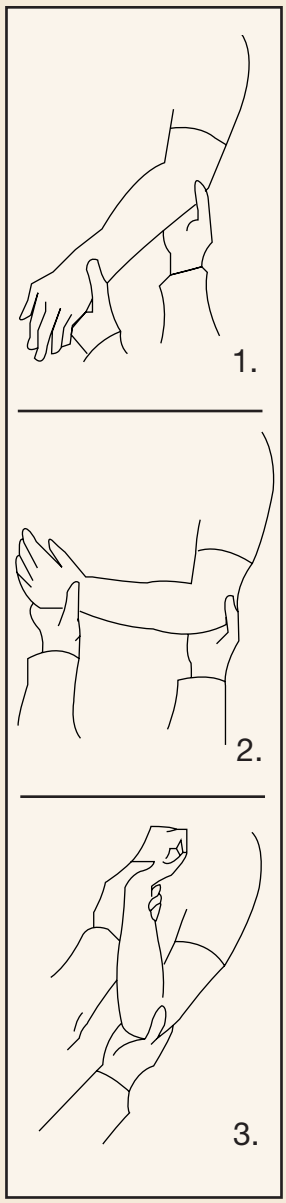

Figure 2. Steps used to reduce radial head subluxation.

- ***Visceral bias:*** Occurs when the physician's own affective state is involved in decision-making, and may result in the patient's complaint being underestimated or overestimated. Diagnosing one's family or friends is sometimes associated with a loss of objectivity and may compromise the usual careful and systematic approach normally taken in clinical practice. It is a good reason for not involving oneself in the diagnosis of family and friends.
- ***Search satisficing and premature diagnostic closure:*** There is a universal tendency to call off the search once we find something, or when we do not find something that we think should be there. In this case, the ED physician is searching for a fracture and, failing to find one, calls off the search. After making or refuting any diagnosis, a clinician should always consider: "What else might this be?"
- ***Anchoring:*** The parent in this case, a physician, is anxious to exclude the possibility that he has not committed the same error as before—miss-

ing the torus fracture. He, therefore, anchors onto the strategy of "rule out fracture." When he is told the X-ray is normal, he feels reassured, and neglects to consider another diagnosis.

- ***Unpacking principle:*** Failure to elicit all relevant information (unpacking) in establishing a differential diagnosis may result in significant possibilities being missed. Perhaps the ED physician's knowledge that the parent was a physician interfered with the depth of his history-taking. In this case, complete details of the mechanism of injury might have alerted the emergency physician to the true diagnosis. Dx

Suggested Reading

1. Croskerry P: Achieving quality in clinical decision making: Cognitive strategies and detection of bias. Acad Emerg Med 2002; 9(11):1184-204.

This department covers selected points to avoid pitfalls and improve patient care by family physicians in the ED. Submissions and feedback can be sent to diagnosis@sta.ca.

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