Acute plastic bowing of the forearm in adults: a report of two cases

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ABSTRACT

We report 2 adult cases where the diagnosis of acute plastic bowing of the forearm was either delayed or missed. In a 21-year-old man, ulnar bowing was missed and fixation was not performed because the patient had no limitation to his range of movement or pain. In a 24-year-old woman, the presentation of bowing in both the ulna and radius was delayed and corrective osteotomy was necessary for restoration of full range of movement. Prompt diagnosis enables manual reposition for easy restoration of full range of movement.

Key words: adult; forearm; osteotomy

INTRODUCTION

Acute plastic bowing of the forearm in adults is rare. Only 19 such cases have been reported. Prompt diagnosis and treatment is the key to restoring a full range of movement (ROM).

CASE REPORTS

Case 1

In May 2004, a 21-year-old man presented with a swollen and tender left forearm after a fall on his outstretched hand while playing handball. Radiographs showed a fracture of the radial shaft but a broad bowing of the ulna was missed (Fig. 1). Immediately after open reduction and internal fixation, the patient had no limitation of ROM. One week later, the bowing of the ulna was noticed on follow-up radiographs. Re-examination of bone scans and magnetic resonance images revealed bony contusion. Because there was no limitation to his ROM or pain, the bowing of the ulna was not fixed and the patient remained pain-free with a full ROM 3 years after injury.

Case 2

In May 2006, a 24-year-old woman presented with a swollen and tender distal left forearm after having the arm caught in a roller one month earlier. The distal ulna showed a bowing deformity, and the apex of the bowing was palpable with the forearm supinated at 90°. Pronation of the forearm was limited to 15°, probably due to an unstable interosseous membrane. Severe pain and a loud ‘pop’ were noted when she tried to fully pronate her forearm. Radiographs were taken with the forearm supinated at 90° and revealed bowing of the ulna and radius with no subluxation of the distal radioulnar joint (Fig. 2). She underwent wedge osteotomy at the apex of the ulna and fixation with a locking plate after confirmation of restoration of a full ROM. Osteotomy of the radius was not performed because a full ROM was restored. She had no limitation of ROM or pain 15 months after injury.
DISCUSSION

Since the first report of an adult case of acute plastic bowing of the forearm in 1976,1 19 cases of acute plastic bowing of the forearm in adults have been reported. The injury mechanism in most of them was gradual compression by a transverse force exerted by rollers (the force is usually longitudinal in children); only 2 cases were caused by a fall on an outstretched hand.2,3 Acute plastic bowing of long bones is possible even after physeal closure in patients up to 30 years old,4 depending on the force applied and the maturity of the bone. Classification systems for diagnosis and treatment remain unavailable.

When forearm fracture and dislocation are apparent and acute plastic bowing is suspected, bone scans and magnetic resonance images should be taken in addition to plain radiographs. Assessment of the outcome should not be based on the radiographic appearance alone, but on functioning and ROM of the adjacent joints.5

Manual repositioning to correct bowing is easy during the acute phase,4–6 but corrective osteotomy is necessary in the chronic phase.3 Our treatment strategy during the acute phase is to correct the deformity with manual repositioning under general anaesthesia until full ROM is confirmed. The forearm is then immobilised with a long-arm cast for 6 weeks. When limitation of the ROM remains or the bowing has become chronic, corrective osteotomy at the apex of the bowing is performed. A full ROM must be confirmed before fixation. The optimal osteotomy site is difficult to determine. There is no established protocol for estimating the extent of radial bowing, although a computer model can be used to decide the optimal osteotomy site.7

REFERENCES