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Original article

Combined median and ulnar nerve palsy complicating distal radius fractures

Florence Dauzere^a, Stéphanie Delclaux^{a,*}, Thuy Trang Pham^b,
Michel Rongièrès^a, Pierre Mansat^a

^a Orthopaedics Department, Toulouse Purpan Teaching Hospital, Toulouse, France

^b Orthopaedics Pediatric Department, Toulouse Purpan Teaching Hospital, Toulouse, France

ARTICLE INFO

Article history:

Received 23 October 2017

Accepted 3 April 2018

Keywords:

Fracture
Radius
Palsy

ABSTRACT

Background: Fractures of the distal radius only rarely give rise to complications in the immediate post-operative period. Combined median and ulnar nerve palsy is a complication that can be missed by the surgeon.

Materials and methods: Three cases diagnosed early after surgery are reported here. The patients were 15, 16, and 30 years of age, respectively. None had preoperative neurological deficits. The youngest patient was injured during sports and the other 2 patients during traffic accidents. All 3 patients had a displaced fracture of the distal radius combined with a fracture of the distal fourth of the ulna or ulnar styloid process and were treated by anterior plate fixation. Operative times were 47, 62, and 120 minutes, respectively. Compartment syndrome was ruled out based on low pain intensity and absence of forearm tightness to palpation.

Results: The electrophysiological study performed 1 month post-injury in all 3 patients showed severe impairments of both median and ulnar nerve function. Median and ulnar nerve release surgery was performed in the 15-year-old 6 weeks post-injury. No nerve damage or fibrosis was seen during the procedure. All patients recovered fully within 3 months and had normal findings from follow-up electrophysiology testing after 6 months.

Discussion: Combined median and ulnar nerve palsy has rarely been reported and is among the rare complications of distal radial fractures that can develop in the event of a high-energy trauma and/or major displacement. Both previously published data and our experience indicate that surgical nerve release is unnecessary. Clinical recovery within 3 months is the rule.

Level of evidence: IV, case-reports.

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1. Introduction

Fractures of the distal radius are rarely accompanied with neurological complications. Median nerve injury has been reported in 5% to 7% of cases. Ulnar nerve injury is far more uncommon, with 2% of 330 articular fractures of the distal radius studied by Melone [1] and a single case (0.05%) among 2000 distal radial fractures studied by Bacorn and Kurtzke [2]. Combined damage to the median and ulnar nerve is an exceedingly rare event for which few published case-series studies are available and no pathophysiological mechanism has been established. Isolated ulnar nerve palsy is usually ascribed primarily to contusion.

Here, 3 patients with combined median and ulnar nerve palsy after a fracture of the distal radius are described. All 3 patients were managed over a period of only 1 year, suggesting that this complication may be less uncommon than believed.

The objective of this study was to describe combined median and ulnar nerve injury after a distal radius fracture and to suggest a treatment strategy for this rare but dramatic complication. Surgical nerve release is not universally recommended in the literature. The severity of the clinical impairments requires a standardised management strategy, particularly as the patients are often severely distressed by their symptoms for which they frequently demand revision surgery.

2. Material and method

Three patients with combined median and ulnar nerve palsy diagnosed shortly after surgery for distal radius fractures were seen

* Corresponding author. Orthopédie, CHU de Toulouse Purpan, TSA 40031, place du Dr Baylac, 31059 Toulouse cedex 9, France.

E-mail address: stephanie.delclaux@laposte.net (S. Delclaux).



Fig. 1. Patient #1, antero-posterior and lateral radiographs before surgery.



Fig. 2. Patient #2, antero-posterior and lateral radiographs before surgery.



Fig. 3. Patient #3, antero-posterior and lateral radiographs before surgery.

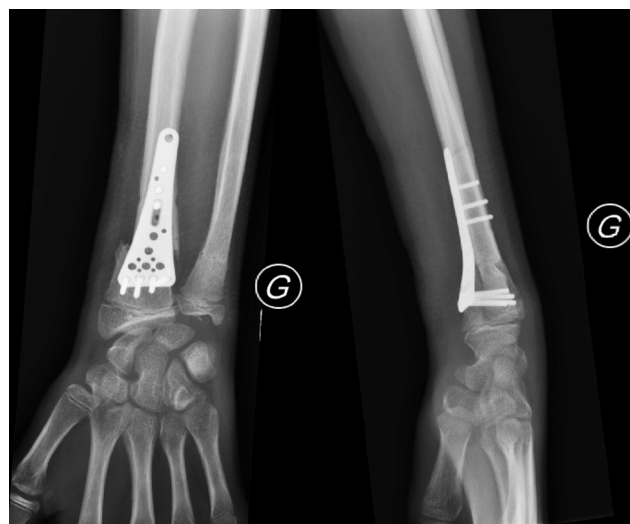


Fig. 4. Patient #1, antero-posterior and lateral radiographs after surgery.

in 2014 at a single orthopaedic and trauma surgery department in a university hospital in Toulouse, France. The 3 patients were male and were aged 15, 16, and 30 years. The fractures were consistently due to high-energy trauma, sustained during sports in 1 patient and during traffic accidents in the other 2 patients.

In the AO classification, the fracture of the distal radius was 23-A3 in 2 patients (Figs. 1 and 2) and 23-C3 in 1 patient (Fig. 3). Either the distal fourth of the ulna or the ulnar styloid process was fractured also. In 1 patient, Gustilo grade 1 skin breakage was present at the dorsal aspect of the forearm.

The patients were first seen at the trauma emergency department of the university hospital, where they were examined by an orthopaedic surgery resident. No neurological deficits were found. Closed reduction with equimolar nitrous oxide/oxygen for analgesia was performed at the emergency department in 2 patients. No radiographs were obtained after reduction. All 3 patients had their fracture immobilised in a long arm splint while waiting for surgery, which was performed 12 h, 13 h, and 6 h post-injury, respectively.

Surgery was performed by a senior hand surgeon under local anaesthesia and short-duration axillary brachial plexus block. A pneumatic tourniquet inflated to 250 mmHg was placed at the root of the limb in all 3 patients. Operative time was 47, 62, and 120 minutes, respectively.

2.1. Operative technique

After inflation of the pneumatic tourniquet at the root of the limb, the volar approach to the radius described by Henry was performed in all 3 patients. In 1 patient, reduction of a displaced articular dorsal fragment required an additional dorsal approach with incision of the extensor retinaculum between the third and fourth compartments. Side-to-side translation was reduced using Muller's forceps combined with external manipulation. Fixation was with an anterior plate (Fig. 4) combined, in 2 patients, with lateral pinning of the radial styloid (Figs. 5 and 6).

The ulnar styloid process was fractured in 1 patient. The distal radio-ulnar joint was stable upon testing at the end of the procedure, indicating that specific treatment of the ulnar styloid fracture was unnecessary. Closed reduction to treat the fractures of the distal fourth of the ulna in the other 2 patients was successful and stable. Neither the median nerve nor the ulnar nerve was

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