

FRACTURE OF THE HUMERAL DIAPHYSIS  
WITH EXTREME ROTATION

by D. CHAN, F. PETRICCIUOLO and N. MAFFULLI

**We report a spiral fracture of the humeral diaphysis with marked rotational deformity complicated by radial nerve neuropraxia in a young girl. Conservative management resulted in fracture healing and full recovery of the radial nerve palsy.**

**Keywords :** neuropraxia ; radial nerve ; conservative management.

**Mots-clés :** neuropraxie ; nerf radial ; traitement orthopédique.

SAMENVATTING

*D. CHAN, F. PETRICCIUOLO en N. MAFFULLI.  
Fractuur van de humerusdiaphyse met extreme rotatie.*

De auteurs beschrijven het geval van een jong meisje met een spiraalvormige fractuur van de humerus, met fikse verplaatsing in exorotatie, gecompliceerd met een neuropraxie van de nervus radialis. Na conservatieve behandeling werd een goede consolidatie bekomen met volledige recuperatie van de paralyse van de nervus radialis.

RÉSUMÉ

*D. CHAN, F. PETRICCIUOLO et N. MAFFULLI.  
Fracture de la diaphyse humérale avec important déplacement en rotation.*

Les auteurs rapportent le cas d'une jeune patiente présentant une fracture spiroïde de la diaphyse humérale avec important déplacement en rotation externe, compliquée d'une neuropraxie du nerf radial. Le traitement conservateur fut suivi d'une consolidation complète de la fracture et d'une récupération de la paralysie du radial.

CASE REPORT

An 11-year-old girl was brought in the local Accident and Emergency Department. Having fallen downstairs, she was found by her mother lying supine with her left forearm trapped behind her back and the left arm twisted. The mother turned her arm so that the forearm was lying by the side of her abdomen, and put the arm in a sling.

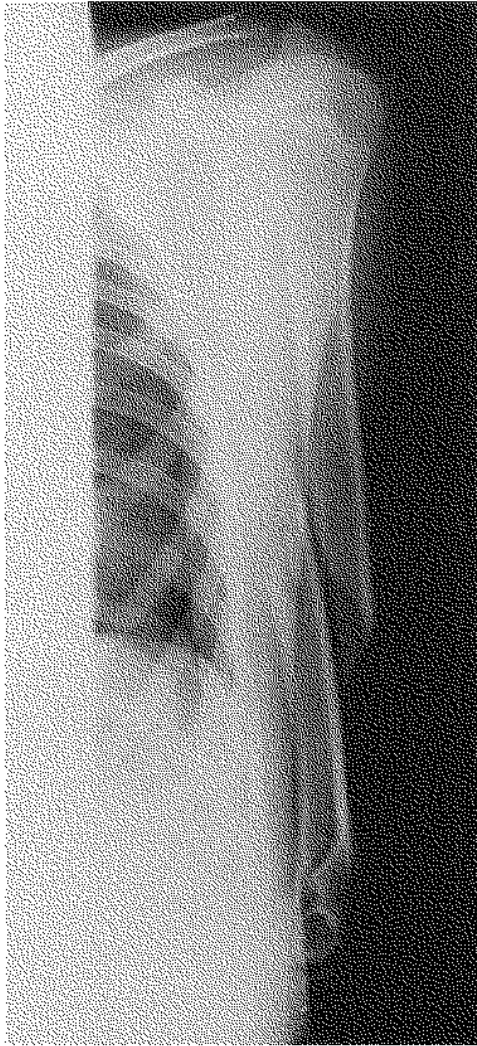
On arrival at the local Accident and Emergency Department the patient complained of paresthesias in her left hand, and impairment of the motility of her left fingers and wrist. The Casualty Officer noted the clinically obvious fracture of the middle third of the humeral diaphysis, but did not realize that the arm had been rotated (fig. 1). He diagnosed a radial nerve lesion complicating the fracture, and referred the girl to our care.

When we examined her, the left hand and forearm were slightly swollen and cyanotic with distended veins. The radial pulse was palpable. The upper arm showed spiral skin creases extending from just beneath the axilla to two transverse fingers above the elbow. It was evident that, in trying to correct the deformity, the girl's mother had externally rotated the arm through 360° (fig. 2).

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*Fig. 1.* — Radiograph showing a spiral fracture of the diaphysis of the left humerus. Rotation of the fragments is evident.



*Fig. 2.* — The arm before reduction. Proximal and distal creases are evident, together with stretching of the skin between them.

Both fracture and neuropraxia were managed conservatively after reduction under general anesthesia. The fracture was solidly united after 8 weeks in a U-slab. The girl had recovered fully from the radial nerve neuropraxia 3 months after the injury.

### DISCUSSION

This case illustrates the importance of careful inspection, so that serious but easily correctable complications are not overlooked (1).

A clinical diagnosis of a complete fracture of the humeral diaphysis is generally obvious because of angular deformity at the fracture site. Despite an extensive literature search, we could not find a similar case of humeral shaft fracture exhibiting such a rotational deformity complicated by radial nerve neuropraxia.

The incidence of radial nerve lesions complicating fractures of the humeral diaphysis varies from 5 to 10% (4). The prognosis is generally good (4), with about 80% recovering spontaneously (2). In spiral fractures, radial nerve palsy can be caused

by entrapment of the radial nerve between the bony fragments at the junction between the lower and the middle third of the humerus (3). Although closed injuries rarely cause a neurotmesis (2, 4), surgical exploration is suggested by some authors (3).

In conclusion, accurate clinical examination should be performed in every patient, in order to promptly plan the correct treatment to avoid dangerous and potentially crippling consequences.

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