RADIAL NERVE ENCLOSED IN THE CALLUS OF A SUPRACONDYLAR FRACTURE

PAN. P. SYMEONIDES, C. PASCHALOGLOU and T. PAGALIDES, ATHENS, GREECE

At operation for the correction of cubitus varus by removal of a wedge based laterally, the radial nerve fortunately was first explored and found to run through a transverse bony tunnel at the posterior level of a supracondylar fracture sustained eight years previously. After elevation of the bony tunnel and nerve *en bloc* the osteotomy was completed; neurapraxia of the radial nerve soon recovered. With hindsight, the entrance and exit foramina of the tunnel could be clearly seen in the antero-posterior radiograph taken before the operation.

The standard course of peripheral nerves is of great importance during operative procedures on the limbs. Deviation is occasionally encountered due to congenital or acquired anomalies. To the latter category belongs this case of enclosure of the radial nerve in the callus of a supracondylar fracture of the humerus which resulted in cubitus varus. The problems with which we were faced during corrective osteotomy are recounted.

CASE REPORT

A man aged twenty-two was admitted to the Air Force Hospital in Athens for left cubitus varus, the sequel of a

Radiographs showed the capitellum more distal than the trochlea, causing marked obliquity of the articular surface. In addition, two small foramina could be seen at the same horizontal level, each three or four millimetres in broadest diameter and rather like large vascular channels (Fig. 1). They appeared to lie on the lateral half of one or other surface of the humerus about five centimetres above the joint line, and at first they were considered to be of no importance.

Operation—A lateral approach was used for corrective osteotomy by removal of a wedge. When the base of the wedge had been outlined low down on the bone and all was ready for its removal, it was decided to explore the radial nerve for reasons of principle rather than of real need. In this region, as is well known, the radial nerve runs anterior to the lateral

FIG. 1

The antero-posterior radiograph of the left elbow taken before operation.

FIG. 2

A photograph taken at operation.

supracondylar fracture eight years previously. This fracture was sustained by a fall on to the outstretched hand. The patient clearly remembered three changes of plaster in quick succession by the village doctor, but no complication such as drop wrist or threatened Volkmann's contracture. Movements of the elbow were now within normal limits, and there were no abnormal neurological findings.

intermuscular septum, deep to the brachio-radialis muscle and the radial extensors of the wrist. It could not be found there, but after extending the incision proximally the nerve was exposed in the spiral groove. On following the course of the nerve distally we realised that it deviated towards the posterior aspect of the humerus parallel to its lateral edge, and entered an osseous tunnel just above the upper line of the osteotomy

Dr Pan. P. Symeonides, 32 Omirou Street, Athens 135, Greece.

Dr C. Paschaloglou, Limvardou 56, Athens 701, Greece.

Dr T. Pagalides, General Airforce Hospital, Kypseli, Athens, Greece.

(Fig. 3). The outlet of the tunnel was about two centimetres medially under the triceps, corresponding to the medial foramen seen in retrospect on the radiograph. The nerve then sharply changed direction by 90 degrees and regained its normal course.

We first thought of abandoning the operation because

case over a period of eight years. Duthie (1957) has described a case of prolonged radial nerve palsy after a fracture of the shaft of the humerus in which the nerve was found to be enclosed in an osseous tunnel that was evident in the radiographs. Roaf (1957) referred to a

FIG. 3

Diagrams of the posterior aspect of the left elbow indicating the course of the radial nerve before and after the operation.

the intraosseous part of the nerve was so close to the site of osteotomy. An attempt to open the tunnel was found difficult and dangerous, and therefore the nerve was elevated *en bloc* with a small oblong of surrounding bone (Fig. 2). The wedge was then excised and the osteotomy fixed by a plate and four screws. An attempt to separate the bone from the nerve was only partly successful because they were firmly attached to one another.

After the operation, neurapraxia of the radial nerve resolved within a month. The osteotomy united uneventfully and the plate and screws were later removed. The patient has now been followed up for two years, over which time there has been no further disorder of the nerve.

DISCUSSION

Entrapment of a nerve in the callus of a fracture is unusual. Seddon (1972) has said that it never causes strangulation, and this had not occurred in the present

case of median nerve paralysis of late onset after dislocation of the elbow with fracture of the medial epicondyle, which during healing created a tunnel ensheathing the nerve. In both cases the nerve palsy indicated the correct diagnosis, which was supported by the radiographic findings.

The problem in our case, however, was to correct a varus deformity of the elbow with no history of impaired function of the related radial nerve. The case is interesting because of the unusual position of the osseous tunnel and the high risk of division or other severe damage of the nerve. We feel that before embarking on a reconstructive operation for post-traumatic cubitus varus it is essential to examine the radiographs carefully for the presence of foramina suggestive of nerve entrapment, and always to explore the radial nerve at an early stage in the procedure.

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