FRACTURE-DISLOCATION OF THE TROCHLEA

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The treatment of injuries about the elbow joint in young children forms an important part of the work of any traumatic unit. Fracture-separation of the capitulum is comparatively common; complete descriptions occur in the text-books, and many articles have been written on the subject. But a similar injury of the trochlea or medial condyle is unusual, and no adequate account of the condition can be found in the literature.

CASE REPORTS

Case 1—A girl aged eight years was referred to the Stafford General Infirmary with a history that she had had a dislocation of her right elbow reduced under general anaesthesia. No radiograph had been taken before the manipulation. A post-manipulation radiograph (Fig. 1) showed a fracture-separation of the trochlea with medial displacement and rotation—the mirror image of the more commonly displaced capitulum. The child was found to have a complete ulnar nerve palsy. One week later, open reduction of the fracture was undertaken. The large mass of the trochlea, carrying almost two-thirds of the articular surface of the lower end of the humerus, was found to be displaced and rotated medially through 90 degrees, so that the fracture surface faced medially and the articular surface laterally. The ulnar nerve was found intact, but torn out of its groove and trapped between the displaced fragment and the lower end of the humerus. The displaced fragment was reduced and retained with catgut. The ulnar nerve was transposed anteriorly, and the elbow fixed in extension with a posterior plaster slab. Post-operative radiographs showed complete reduction (Fig. 2).

Two weeks after operation, the extended position was converted to one of flexion, a collar and cuff replacing the plaster slab, and the angle of flexion was gradually increased. Active movements were begun a week later, and the collar and cuff discarded after seven weeks. Early evidence of recovery of the ulnar palsy was observed four months after the injury and recovery was complete at eight months: there was a full range of active movement at the elbow joint. Seen ten years later, the patient was free from symptoms and the elbow was clinically normal and radiologically satisfactory (Fig. 3).

Case 2—A boy aged twelve fell and struck the point of his right elbow. Twelve days later he was referred to the North Staffordshire Royal Infirmary. On examination, the elbow was swollen and there was marked tenderness over the medial aspect. Attempted movement was painful. The function of the hand was normal, and there was no evidence of nerve palsy. Radiographs showed that the trochlea had been fractured and displaced by rotation through 90 degrees, so that the articular surface now faced laterally, and the fracture surface medially (Fig. 4). An attempt at closed reduction produced no improvement. At open reduction the large fragment, carrying two-thirds of the articular surface of the lower end of the humerus, was found in the position indicated in the radiograph. There was also a fracture of the articular cartilage of the trochlear notch of the ulna. The large fragment was replaced accurately and sutured in position with catgut. There was no tendency to redisplacement. The wound was closed, and the elbow put in a collar-and-cuff sling, with the joint flexed beyond the right angle. Radiographs showed complete reduction (Fig. 5). Flexion of the elbow was increased on alternate days until full flexion was obtained. Three weeks after operation flexion was full, and then the sling was gradually lowered, and active movements were begun. A full range of active movements was regained within six months. Fifteen months later the elbow was clinically normal and radiographs showed a satisfactory joint (Fig. 6).

FIG. 1

Case 1—Child aged eight. Fracture-dislocation of the trochlea before reduction.

FIG. 2

Case 1—After open reduction.

FIG. 3

Case 1—Condition ten years later.

FIG. 4

Case 2—Child aged twelve. Fracture-dislocation of the right trochlea before reduction.

FIG. 5

Case 2—After open reduction.

FIG. 6

Case 2—Condition twenty-one months later.

DISCUSSION

This injury is the "mirror image" of the much commoner fracture of the capitulum with gross rotational displacement. The type of displacement is the same, and in both it is associated with complete tearing of the overlying aponeurosis. Fracture of the capitulum is often associated with damage to the head of the radius, and in the case of the trochlea the upper end of the ulna may be damaged (Case 2). The injury is caused by force applied to the upper end of the ulna. It can occur with posterior dislocation of the elbow, and, although there is no radiological confirmation, it was stated that in Case 1 a dislocation was originally present. Dahl-Iversen (1936) described a case in a girl of twelve who had struck her elbow sharply against a wall, and the displacement was like that described in my cases. Open reduction was undertaken. Pollosson and Arnulf (1937) described a case in a man of thirty-two in whom the trochlea was fractured and displaced with a postero-lateral dislocation of the elbow. An attempt at closed reduction worsened the position of the trochlear fragment, and open operation was carried out. Sixteen months after operation the range of elbow movement was 60 degrees. In both these cases there appeared to be some extra-osseous calcification, possibly from operative stripping of the soft tissues. Speed and Macey (1933) showed a radiograph of a fracture of the trochlea treated by pin fixation, but gave no account of the case. A specimen from another case was illustrated by Wilson and Cochrane (1925). These are the only other cases that I have been able to find in the literature.

SUMMARY

1. Two cases of fracture-dislocation of the trochlea are described. One case was complicated by complete ulnar nerve palsy.
2. The injury is caused by direct force applied to the point of the elbow, or it may be associated with posterior dislocation of the joint.
3. Open reduction is recommended, the fragment being held in position by soft-tissue sutures alone.
4. Four other cases mentioned in the literature are reviewed.

I wish to thank Mr C. S. Walker for permission to publish these cases and for his kind assistance.

REFERENCES

- DAHL-IVERSEN, E. (1936): Fracture condylienne humérale interne. Réduction simple, sanglante. *Lyon Chirurgical*, **33**, 234.
- POLLOSSON, E., and ARNULF, G. (1937): Fracture du condyle interne—Reposition sanglante. *Lyon Chirurgical*, **34**, 337.
- SPEED, J. S., and MACEY, H. B. (1933): Fractures of the Humeral Condyles in Children. *Journal of Bone and Joint Surgery*, **15**, 903.
- WILSON, P. D., and COCHRANE, W. A. (1925): *Fractures and Dislocations*. Philadelphia and London: J. B. Lippincott Company.