CASE REPORT

Adolescent-type Tillaux fracture of the ankle: two case reports

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SUMMARY

Fracture of the lateral portion of the distal end of the tibia in adults is known as the fracture of Tillaux (Tillaux, 1872). The fracture line extends vertically from the distal articular surface of the tibia upwards to the lateral cortex. The fragment is roughly quadrangular in shape. The analogous epiphyseal injury is less common and two such cases are presented here, both were fixed internally. There now appears to be a consensus of opinion that for fractures of the lateral portion of the distal tibial epiphysis open reduction should be performed, and that closed reduction should be reserved for undisplaced or minimally displaced fractures only.

INTRODUCTION

It is generally agreed that lateral rotation of the foot or medial rotation of the leg on the fixed foot is responsible for the injury (Kleiger & Mankin, 1964). There is avulsion of the lateral portion of the tibial epiphysis by the inferior tibio-fibular ligament which passes from the fibular metaphysis to the tibial metaphysis. Avulsion of the bone occurs because of two contributing factors. First, the epiphyseal plate is weaker than normal ligament, tendons or capsule (Sharrard, 1979). Second, the manner in which the distal tibial epiphysis closes, in that the central and medial portions close before the lateral portion (Davies & Parson, 1927). Closure of the distal tibial epiphysis takes approximately 18 months (between 13–18 years) and during this time the weaker lateral portion is vulnerable to isolated avulsion.

CASE REPORTS

Case 1

A 14-year-old girl was admitted following an injury to her right ankle. Radiographs revealed a Tillaux fracture (Figs 1a and 1b). Closed reduction was attempted but was unsuccessful. At operation periosteum was interposed between the fragments. An A.O. screw was inserted (Fig. 2) and a plaster applied for 6 weeks. An excellent result was obtained with the patient regaining full pain-free movements.

Fig. 1. (a) Antero-posterior and (b) lateral view of the Tillaux fracture of ankle in 14-year-old girl. Arrows demarcate the fracture fragment.

Fig. 2. Radiograph post internal fixation with A.O. screw.

Case 2

A 12-year-old girl sustained a twisting injury to her right ankle. She was still capable of weight-bearing but radiographs revealed a similar Tillaux fracture. Manipulation under anaesthesia again failed to reduce the fracture and so open reduction with two 'K' wires was performed. Plaster and wires were removed after six weeks. Recovery was uneventful and full pain-free movement restored.

DISCUSSION

Over the years opinion as to the way these injuries are best managed has changed. Originally Carothers & Crenshaw (1957) favoured closed reduction and stated that accurate reposition of the displaced fragment by operative intervention was not indicated. Kleiger & Mankin (1964) managed five out of eight patients with adolescent type Tillaux fractures with closed reduction. Follow-up was for less than a year but results on the whole were satisfactory. In this study they reported an unusual complication in a 13-year-old girl. They noted that 4 months after initial closed reduction both the extensor hallucis longus and extensor digitorum longus were adherent to the anterior aspect of the ankle joint, and required operative exploration before full ankle movements were regained.

In 1963 Salter & Harris published their classic paper on epiphyseal injuries. They classified injuries into six types and commented on the prognosis and complications of each type. Fractures of the lateral portion of the distal tibial epiphysis are usually Salter Type III i.e. the fracture line extends from the joint surface to the weak zone of the epiphyseal plate and then extends along the plate to its periphery. Salter stated that for a good outcome in Type III injuries the single most important factor is the restoration of a smooth joint surface and that the dreaded complication of early epiphyseal plate closure and subsequent deformity is very unusual. Subsequent work reported by Rang (1974) and Sharrard (1979) have all favoured accurate reduction of joint surface by open reduction with wires or screws. All claim good functional and radiological results.

The consensus of opinion now appears to be that for fractures of the lateral portion of the distal tibial epiphysis open reduction should be attempted and that closed reduction should be reserved only for undisplaced or minimally displaced fractures. If such fractures are not accurately reduced they may act as a bony block leading to diminished ankle movements. There may also be weakness of the ankle due to disruption of the inferior tibio-fibular ligament. Finally, there is an increased risk of secondary osteoarthritis due to irregularity of the joint surface.

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