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Grade III injuries of the lateral ligaments of the ankle: the incidence and a simple stress test

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SUMMARY

One hundred and seventy-five consecutive acute ankle injuries were assessed for instability. A simplified radiological anterior stress test, without anaesthesia, was used to assess instability. Nineteen patients (11%) showed evidence of gross instability (Grade III injuries). This is recommended as a simple screening test.

INTRODUCTION

Ankle injuries are common and comprise about 4% of the workload of accident and emergency departments. About 90% of these injuries fall in the category of 'ankle sprains' with no evidence of bone injuries (Vargish *et al.* 1983).

Cass & Morrey (1984) have divided these injuries into three grades depending on the severity of the injury: Grade I: mild stretch of the ligaments and no instability; Grade II: an incomplete tear of the ligaments with mild instability; and Grade III: a complete tear of the ligaments with gross instability. The reason for differentiating the three grades is because their treatment is different. Grade I and II injuries do well with conservative treatment, but Grade III require immobilisation in plaster or surgery. Delayed repair or reconstructive surgery is offered to those with chronic instability symptoms (Cass & Morrey, 1984; Evans *et al.*, 1984; Freeman, 1965).

A variety of sophisticated tests have been described to distinguish between Grade I and II, and Grade III injuries. These include: arthrography (Bostrom *et al.*, 1965); peroneal tenography (Black *et al.*, 1978); inversion stress (talar tilt) (Rubin & Witten, 1960); anterior stress (anterior drawer sign) (Glasgow *et al.*, 1980); or a combination of

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any of these, for example, the stress-tenogram (Evans & Frenyo, 1979). For logistical reasons, these tests cannot be done on all ankle sprains but it is notoriously difficult to categorise ankle sprains by clinical examination. What is required, therefore, is a simple, rapid method of radiological assessment of ankle ligament integrity which may be performed *without* medical staff being present: we describe such a test.

METHOD

Patients with ankle injuries occurring less than 24 h earlier were studied. They were aged between 15 and 45 years and had no evidence of a fracture after clinical and radiological examination.

Their ankles were assessed for ligamentous rupture using a padded wooden wedge and foot rest. The knee was flexed to relax the calf muscles. The leg was internally rotated until the malleoli were equidistant from the table (i.e. 15–20 degrees internal rotation) with the foot in slight inversion, thereby achieving a true lateral position. A moulded sand bag, weight 4·5 kg, was placed on the lower tibia (Fig. 1); it was positioned 10 cms from the lateral malleolus and left in position for 90 seconds to overcome the initial muscle spasm.

If X-rays of the injured side were equivocal, then views of the uninjured side were obtained for comparison. A gap of more than 6 mm between the posterior tip of the tibia and the end of the articular surface of the talus or a difference of more than 3 mm from the uninjured side are regarded as positive and suggest a tear of the anterior talo-fibular

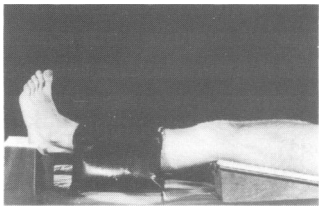

Fig. 1 Moulded sand bag placed on the lower tibia.

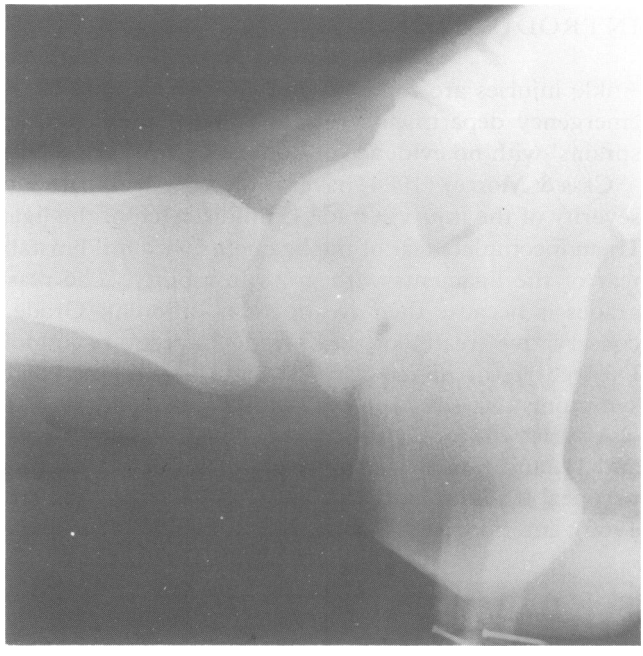

Fig. 2 A tear of the anterior talo-fibular ligament.

ligament, with or without other associated ligaments rupture (Glasgow *et al.*, 1980) (Fig. 2).

The study was designed so that the technique could be performed by trained radiographers with a wide range of experience.

RESULTS

In all, 206 patients were studied (Table 1): 31 (15%) had fractures. The remaining 175 patients included 120 males and 55 females with a mean age of 25 years. Using the described technique, 19 (11%) of those patients who had no fractures had a talo-tibial gap in excess of 6 mm. The mean distance was 9 mm (range: 6–13 mm). In the remainder, the mean distance was 4 mm (range: 3–5·9 mm).

Table 1 Soft tissue injuries of the ankle

	Stable	Unstable	Total
No. of patients (%)	164 (89)	19 (11)	175 (100)
Sex			
Male	106	14	120
Female	50	5	55
Age			
Mean			25 years
Range			15–45 years
Posterior Talo-Tibial Gap			
Mean	4mm	9mm	
Range	3–5·9mm	6–13mm	
Follow-up time			
Mean	9 days	9 weeks	
Range	5–14 days	4–17 weeks	

The average follow-up time in the unstable group before discharge was 9 weeks (range: 4–17 weeks). Primary surgical repair was carried out on one of two patients examined under general anaesthesia. The rest were treated conservatively with initial immobilisation in P.O.P.; on average 4 weeks (range: 3–6 weeks).

The average follow-up time in the stable group before discharge was 9 days (range: 5–14 days). They were treated with either Double Tubigrip, Eversion Strapping or a newly designed ankle support (Muwanga *et al.*, 1986).

None of the investigations had to be curtailed because of pain. No technical difficulties were encountered and good radiographs were taken by all the radiographers.

DISCUSSION

Much has been written about the treatment of ankle injuries: about 12% of patients will have fractures (Vargish *et al.*, 1983) but the remainder present a diagnostic problem. A significant number will have ligamentous rupture and, if they are not treated, a chronically unstable ankle may result.

Clinical examination can be helpful but it may be misleading because of the inexperience of the examining doctor. It is difficult to assess many ankles because of pain. Local tenderness is one of the most reliable signs in the acutely injured ankle (Brooks *et al.*, 1981; Vargish *et al.*, 1983).

Unlike Glasgow *et al.* (1980), the present authors have *not* used any form of anaesthesia and *no* physician was required to be present during the test.

The method of performing the anterior stress test described here is rapid, technically simple and painless. It is, therefore, suitable for use as a screening test.

The best way to treat Grade III injuries is still a subject for debate (Cass & Morrey, 1984; Lightowler, 1984; Evans *et al.*, 1984). It is agreed that they need more energetic treatment than simple supports or early physiotherapy. It is essential, therefore, that they are diagnosed as early as possible. It would appear unnecessary to differentiate between Grade I and Grade II injuries as the treatment for these two groups is the same (Cass & Morrey, 1984).

It is neither practicable or ethical to subject all patients with acute ankle injuries to an invasive radiological procedure if a non-invasive one is available. Our experience with a simplified anterior radiological stress test used as a screening test showed an 11% incidence of instability. This is a high incidence, bearing in mind the limitation of the anterior stress tests (Lindstrand & Mortensson, 1977).

One of the reasons why the treatment of severe ankle injuries is in dispute is because of the difficulty of diagnosis. It may be that the widespread use of a simple screening test will enable rational treatment of this potentially disabling injury.

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