

THE USE OF SPIKED PLASTIC WASHERS IN THE REPAIR OF AVULSED LIGAMENTS

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This paper illustrates the use of spiked plastic washers and A.O. compression screws in the repair of ligaments which have been avulsed from their bony origins. The technique is simple and some examples are described.

Key words: ligament repair; spiked plastic washers

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Tears of the ligaments of the knee and ankle are common injuries. Primary repair is indicated in the major joints when there is significant loss of continuity of a major ligament. If ligamentous continuity is not reconstituted, the joint will remain unstable and traumatic arthritis may result (Campbell 1971).

Injuries in which part or all of the ligament has been avulsed from its bony attachment are difficult to repair. With standard suturing techniques only an approximation can be achieved without reconstituting the normal tension and instability often results. These avulsion injuries (with or without a small fragment of bone) may be securely repaired with a compression screw and a spiked plastic washer.

MATERIALS AND METHODS

Compression screws are of the cancellous bone type and are made in two sizes. The small size has a thread diameter of 4 mm. The larger has a diameter of 6.5 mm. They are used to obtain interfragmentary compression in the treatment of fractures. The spiked washer is made of polyacetal resin, and can be obtained in two sizes. The smaller one has an outer diameter of 8 mm and the larger of 13.5 mm (Figure 1).

At exploration, the nature and extent of the rupture is assessed. The technique described is suitable for the repair of ligaments which have been avulsed from their bony attachment. Firstly, the ligament is temporarily approximated to the site from which it has become de-

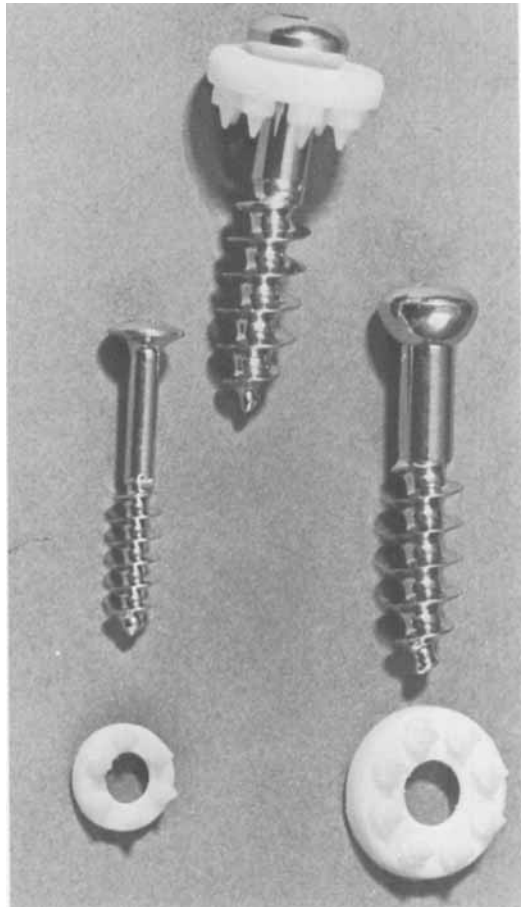


Figure 1. Cancellous screws with spiked plastic washers - 2 sizes.



Figure 2

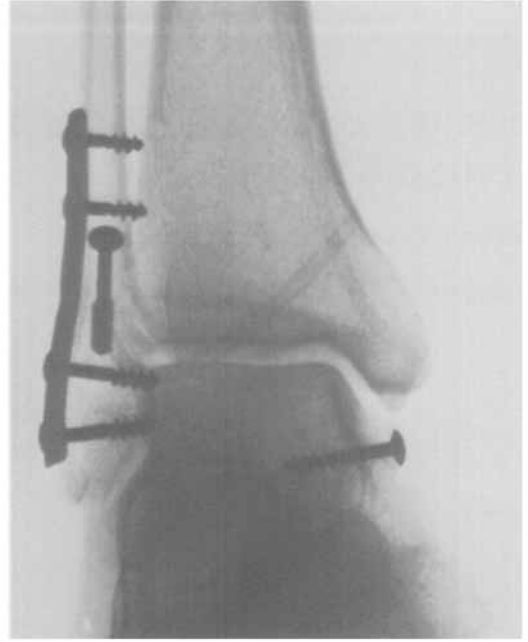


Figure 3



Figure 4a



Figure 4b

tached. Depending on the screw size to be used the bone is then drilled with either a 2 mm or a 3.2 mm drill bit and tapped with a 3.5 or a 6.5 mm tap. The screw is threaded through the spiked washer and then through the end of the ligament to be repaired. As the screw is tightened into the bone the ligament is firmly stretched. The presence of the spiked washer prevents the screw head cutting through the ligament. It also gives a firm grip and allows the ligament to be placed under tension. Postoperative splintage is the same as that for conventional repairs.

CASE REPORTS

Case 1. A man aged 53 years sustained an inversion injury to his ankle. The anterior talo-fibular and calcaneo-fibular bands of the lateral ligament were cleanly detached from their calcaneal and talar origins. The calcaneo-fibular band was held in place with a compression screw and a spiked washer. The rest of the ligament was sutured (Figure 2).

Case 2. A 53-year-old man had a Weber type B ankle fracture in which the lower fibula was fractured in association with avulsion of the deep portion of the deltoid ligament from the talus (Muller et al. 1970). Following internal fixation of the fibular fracture the ligament was repaired using a compression screw and a spiked washer (Figure 3).

Case 3. A man aged 24 years suffered a severe varus strain to his knee at football. The lateral collateral ligament as well as the entire tibial capsular attachment was completely avulsed from the fibula and the upper tibia. These were repaired using four compression screws with spiked washers (Figures 4A and 4B).

Case 4. A woman 34 years of age had an avulsion fracture of the calcaneum in which the tendo achillis insertion was avulsed from the calcaneum together with a wedge of bone. Following open reduction the reduction was held with two compression screws and two spiked washers (Figure 5).

Figure 2. Rupture of the lateral ligament of the ankle – internal fixation.

Figure 3. Weber type B fracture with rupture of the deltoid ligament.

Figure 4A and B. Complete avulsion of the fibular collateral ligament with capsular detachment from the upper tibia.

DISCUSSION

The treatment of ligament injuries aims at the restoration of stability to associated joints. The employment of compression screws and spiked plastic washers facilitates the repair of avulsed ligaments and allows tension to be applied. In a case where the ruptured ligament includes a small detached fragment of bone, fixation with a compression screw alone tends to splinter the bone fragment. The additional use of the spiked washer prevents this by compressing the fragment together.

The cases described are examples of the use to which the spiked washer may be put. We have employed them in over two dozen cases. Apart from their use in trauma, many uses in elective orthopaedics can be found e.g. fixation of the capsular and labral defect in a Bankhart lesion of the shoulder. The techniques of repair are simple and straightforward.



Figure 5. Avulsion of the tendo achillis from the calcaneum together with a bony fragment.

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