OSTEOCHONDRITIS DISSECANS OF THE TALUS

THE LATE RESULTS OF SURGICAL TREATMENT

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Thirty-five cases of osteochondritis dissecans of the talus, operated on between 1950 and 1978, were studied. Twenty-four were available for follow-up an average of 47 months later. Three standard surgical approaches were used, and the osteochondritic fragment removed. In some cases the base of the defect was drilled. Good results were obtained in 15 patients, and fair in nine. There were no poor results. It was concluded that the defect is caused by trauma; that early operation gives the best results, 12 months being the critical delay time; that drilling the base of the defect improves results; and that the sex of the patient and the location of lesion are of little significance.

Although the lesion of osteochondritis dissecans of the talus is well known, there is little information in the literature concerning the results of surgical treatment. The aims of this investigation were, first, to evaluate the results of surgical treatment over a long period of time and, secondly, to see if it was possible to make an earlier diagnosis of the lesion. As chronic recurring pain in the ankle is not uncommon, a more diligent search for this lesion early in the clinical course may lead to earlier diagnosis and successful non-operative treatment.

Osteochondritis dissecans of the talus is defined as a subchondral bony lesion of a small fragment of bone, usually under two centimetres in diameter, with overlying intact articular cartilage. This fragment then becomes separated from its bed and undergoes necrosis.

In 1856 Munro reported the first loose body removed from an ankle (Phemister 1924). In 1888 Konig first coined the term osteochondritis dissecans, with reference to the knee, and in 1922 Kappis described the same lesion in the talus. Axhausen had earlier described the lesion as being traumatic in origin but revised his opinion towards that of an avascular process (Axhausen 1928). In 1932 Rendu first described articular fractures of the talus. To add to the confusion there are a number of synonyms for this lesion: osteocartilaginous body, joint mice, loose bodies, intra-articular fragmentary fracture, and transchondral fracture of the talus. Earlier controversies about aetiology centred on disputes between traumatic and vascular factors. Those who feel that it is a traumatic lesion refer to it as a transchondral fracture of the talus (Berndt and Harty 1959) and more recently transchondral talar dome fractures (Davidson *et al.* 1967).

Mechanism of injury. The injury is sustained during inversion of the ankle. If the foot is plantar flexed during inversion, a medial lesion will result from compression of the medial talar dome by the tibia, secondary to spiralling and shortening of the collateral ligaments. If the foot is dorsiflexed, a lateral lesion will result from shearing forces by the fibula. The anatomy of the talar dome and the ankle mortise is such that medial lesions are posterior, and lateral lesions more anterior (Besson and Wellinger 1967).

Diagnosis. The diagnosis of this lesion is often obscure in the early stages, and many of the cases are doubtless originally treated as sprains. A point that must be stressed is that the symptoms of osteochondritis dissecans of the talus can be either acute or chronic. With an acute history the symptoms of the initial trauma, usually an inversion injury, will predominate with eventual resolution in three to six weeks, followed by the onset of chronic symptoms. A chronic history primarily, with symptoms of pain, stiffness, instability or locking, can develop with or without an antecedent acute history. A more persistent diagnostic approach to the sprained ankle that does not improve may be rewarded by earlier diagnosis of this lesion.

The diagnosis often can be made on standard radiographs of the ankle (Figs 1 and 2). However, it is not uncommon for the osteochondritic fragment to be poorly seen on standard views, and tomograms (Fig. 3) will usually provide more accurate information (Mensor and Melody 1941; Berndt and Harty 1959; Blom and Strijk 1975; Alexander and Lichtman 1980; Canale and Belding 1980).

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Fig. 1

Fig. 2

Lateral and anteroposterior radiographs of an ankle with osteochondritis dissecans of the talus.

Fig. 3

Lateral tomogram of the ankle.

MATERIAL AND METHODS

This study identified 35 patients with a diagnosis of osteochondritis dissecans of the talus, operated on between 1950 and 1978, in three McGill University teaching hospitals. Twenty-four of these patients (13 male, 11 female) were available for follow-up and were examined by the authors; in nine the right ankle was involved and in 15 the left ankle. The pathological diagnosis in 22 of the 24 patients showed non-specific bony necrosis with intact, viable articular cartilage. A history of trauma was present in 22. There was no family history in any case.

The duration of follow-up on these cases ranged from three months to 21 years, with an average of 47 months. The age of the patients at the time of operation ranged from 15 to 46 years, with an average of 24 years; 11 were over 25 years of age. Because of the delay in making an accurate diagnosis there was a prolonged interval between the onset of symptoms and the time of operation, averaging 33 months.

As most of the patients had a history of an inversion injury to the ankle, the period before symptoms became prominent was variable. However, once the symptoms became established, they were uniform. All patients complained of pain when using the ankle and nine had a

sensation of, or actual, instability. Eight patients complained of stiffness of the ankle.

Operative procedure. Regardless of the surgical approach used, all osteochondritic lesions were sharply excised. The surgical procedures performed depended on the location of the lesion. Eleven patients had lesions in the lateral part of the talus and were treated through anterior arthrotomy of the ankle. Thirteen patients had medial lesions of the talus: five were operated through an anterior ankle arthrotomy, and eight required a medial malleolar osteotomy because the lesions were more posteriorly placed in the talus. The medial malleolar osteotomy afforded excellent access to the medially placed lesions; of the eight osteotomies, only one went on to non-union, and this may have been due to an error in fixation. The authors recommend a shallow inverted-V osteotomy of the medial malleolus to enable the fragment to be refixed to the tibia with a screw, thus providing greater stability (Figs 4-6).

After-care. If an arthrotomy only was performed, the ankle was immobilised in plaster for approximately 14 days. Weight-bearing was then avoided for a total of three months, but flexion and extension movements and progressive muscular exercises against resistance were

Fig. 4

Fig. 5

Fig. 6

The inverted-V osteotomy. Figure 4—Lesion before operation. Figure 5—The incision. Figure 6—The access to the talus.

prescribed during this period. If osteotomy was performed on the medial side, the patients received a short leg cast for 6 to 12 weeks until the osteotomy was healed. They were then allowed to bear weight.

Assessment. Our results were evaluated using a grading system which combined subjective with the objective assessment. Each patient was given a score from 1 to 3 for pain, range of movement, activities of daily living and radiographic appearance (Table I). The scores for the four factors were then totalled. A composite score of 4 to 6 was considered good, 7 to 9 fair, and 10 to 12 poor.

Table I. Score values

	1	2	3
Pain	None	Moderate	Severe
Range of movement	Normal	< 10° loss	> 10° loss
Activity of daily living	Normal	Cannot do heavy work	Cannot do light work
Radiograph	No degeneration	Degeneration	Osteo-arthritis

RESULTS

In our study there were no infections and only one non-union of a medial malleolar osteotomy. There were no other complications.

The composite scores of the 24 patients before and after operation were compared. Before operation only one patient was considered good, while 23 were considered fair; after operation 15 patients were considered good, nine fair. The most persistent symptom was pain.

Duration of symptoms. The interval between the onset of symptoms and the time of operation averaged 29 months. Of the eight patients operated on within 12 months, there was an average improvement of 3.0 in the overall scores, all resulting in good scores. In the 16 patients operated upon after 12 months, an average improvement in score of only 1.0 was obtained; all nine patients whose score remained fair were in this group.

Age at operation. The average age at operation was 24 years. The 13 patients under the age of 25 improved their score by an average of 2.7. The 11 patients aged 25 or over only had an average improvement of 1.0.

Drilling the base of the defect. Of the 15 patients with good results, 12 had had drilling of the base of the defect. Of the nine patients with fair results, only two of them had had drilling of the defect.

In our study, neither the side of the lesion nor the presence of the medial malleolar osteotomy had any apparent influence on the results.

DISCUSSION

Our experience suggests that the apparent infrequency of this lesion may be misleading. Our original series identified 35 patients over a 28-year period in three hospitals (or 84 "hospital years"): this represents an approximate frequency of one case every 2.4 years. Since this study was completed we have identified four new cases in one year at one hospital.

Although we were not able to compare the results of surgical and non-surgical treatment, the literature shows that surgically treated patients have better results (Mensor and Melody 1941; Ray and Coughlin 1947; Berndt and Harty 1959; Davidson *et al.* 1967; Blom and Strijk 1975; Petrie 1977; Alexander and Lichtman 1980; Canale and Belding 1980). Our four recent cases have, however, all been given non-operative treatment, and although the follow-up is too short to be significant we are optimistic that very early treatment, consisting of proper immobilisation in a plaster cast, may result in union of the fragment and prevent the lesion from reaching a chronic state. To institute this early treatment an early accurate diagnosis must be made. Therefore, when one is confronted with an appropriate history and cannot identify such a lesion on routine radiographs, tomography must frequently be used to make the diagnosis (Davidson *et al.* 1967; Canale and Belding 1980).

In the few cases that demonstrated degenerative changes in the ankle, the correlation was very poor between this finding on the radiograph and pain in the ankle. All but one of our patients had good function despite some rather poor radiographic appearances.

In conclusion, it is our impression that surgical

treatment is worthwhile for osteochondritis dissecans of the talus. To achieve optimal results, early diagnosis of the lesion is mandatory, as is a minimum of delay between diagnosis and operation. The results are clearly better when the operation is performed within 12 months from the onset of symptoms. Drilling of the base of the defect, after excision of the osteochondritic fragment, should always be performed.

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