The role of ankle arthroscopy and surgical approach in lateral ankle ligament repair

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Abstract

Lateral ankle instability may be associated with intra-articular ankle pathology and peroneal tendon pathology. This study was conducted to determine the relative incidence of associated pathology identified during lateral ligament repair. This information was analysed to determine if a standard surgical protocol of arthroscopic ankle assessment followed by ligament repair through a longitudinal postero-lateral incision (to include exposure of the peronei) is warranted.

A retrospective review of 79 patient notes was conducted. All patients had peroneal tendon inspection at surgery and 58 underwent ankle arthroscopy immediately prior to ligament repair. Chondral and osteochondral lesions were identified in 29%; loose bodies in 24%; anterior osteophytes in 41% and peroneal tendon pathology in 14%. The presence of a number of lesions was not evident preoperatively (27% of chondral lesions and 36% of peroneal tendon tears).

These results suggest that with unstable ankles requiring stabilisation, a protocol including ankle arthroscopy followed by lateral ligament repair through a postero-lateral approach is warranted.

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1. Introduction

Inversion injuries of the ankle may result in injury and functional instability of the lateral ankle ligaments. As part of the initial injury, or during subsequent episodes of joint instability, other structures may be damaged. These include the articular surfaces and the peroneal tendons. These lesions may be clinically occult [1,2] and if not addressed at the time of ligament stabilisation may result in continued symptoms. Consequently, some authors recommend that lateral ligament repair or reconstruction be accompanied by inspection of the ankle joint by arthroscopy [1,3,4] or arthrotomy [5]. Similarly, some authors recommend that the peroneal sheath be opened and inspected as part of either a reconstruction procedure using the peroneal tendons [6,7] or anatomical repair [5,8]. Few authors have shown the combined association of intra-articular and peroneal tendon pathology with ankle instability [5].

Anatomical repair of the anterior talofibular (ATFL) and calcaneofibular (CFL) ligaments has been successfully used to correct mechanical instability in sportspersons utilising a curvilinear incision over the anterior distal fibular [9]. Lack of extensile exposure with this incision makes it difficult to adequately inspect and surgically correct peroneal tendon pathology.

In ankles requiring stabilisation, our usual surgical protocol is to perform an ankle arthroscopy followed by anatomical repair of the ATFL and CFL via an extensile approach along the line of the peroneal tendons. Ankle arthroscopy was not considered necessary if there were no preoperative clinical features of intra-articular pathology and radiographs were normal. The purpose of this study was to analyse our decision making process and detail any associated pathology to determine if our surgical protocol is based on sound principles.
2. Methods

A retrospective analysis of records was made of patients who underwent lateral ligament repair under the senior author (HKS) during a three-year period (2000–2003) at a sports injury clinic. Seventy-nine patients were studied (54 males, 25 females). The mean age was 30 and median time from injury to surgery was 36 (range 5–240) months. There were 16 competitive athletes, 36 recreational athletes and 27 who were non-athletes.

All patients gave a history of injury and subsequent episodes of inversion instability with failure of non-operative measures, including a specific rehabilitation programme supervised by a physical therapist. The ability or otherwise to weight bear in the days following injury and the use of crutches was documented as was the presence of pain and swelling between episodes of instability. A thorough ankle examination was conducted and all patients were documented as having mechanical lateral ligament instability. In addition, the peroneal tendons were assessed for signs of tenderness, an intra-sheath effusion, weakness and stability. The diagnostic criteria chosen to indicate a possible osteochondral lesion (OCL) were the presence of two of the following three; (i) the requirement of the patient to use crutches following the initial traumatic episode, (ii) a history of persistent ankle pain between episodes of instability and (iii) the presence of swelling reported by the patient between episodes of instability or at the time of examination. The presence of a loose body was clinically suspected by mechanical symptoms of locking, painful catching or clicking and/or by loose bodies seen on radiographs. Hindfoot alignment was clinically assessed to determine if a varus malalignment contributed to the lateral instability complex. If this was the case then a lateralisling heel shift was recommended at the time of ligament repair (and was deemed necessary in three patients).

Plain, standing radiographs were performed to identify bony irregularities and concomitant injuries. Stress views were not performed. Ultrasound examination of the peroneal tendons was performed if clinical examination suggested peroneal pathology and magnetic resonance imaging (MRI) was requested if an OCL was suspected.

An ankle arthroscopy was performed in 58 patients (73%) immediately prior to lateral ligament repair. Any significant intra-articular pathology was addressed at this time. Of the 21 patients who did not undergo arthroscopy, 15 did not fulfil the above criteria for the diagnosis of an OCL and had normal radiographs with the exception of avulsion fragments from the tip of the fibula. Of the remaining six patients, one had an MRI showing no intra-articular pathology, one had radiographic signs of early ankle arthritis and the remaining four had signs and ultrasound evidence of peroneal tendon pathology, which was deemed their principle co-pathology.

The surgical approach to the lateral ligaments was via a curved longitudinal incision along the posterior aspect of the fibula commencing 2 cm proximal to and ending anteroinferior to the distal fibula tip. This incision allowed for inspection of the lateral ligaments and direct repair to the fibula using a modified Brostrom technique. Additionally, it allowed for inspection of the peroneal tendons and subsequent extensile exposure for peroneal tenoplasty if necessary.

3. Results

The various pathological entities identified at surgery for the study population who underwent lateral ligament repair are shown in Table 1. The data include only those abnormalities that required surgical intervention (i.e. excluding minor articular scuffs and low grade synovitis). Also included are the numbers of cases that were clinically evident before arthroscopy and those identified de novo at surgery. The median time between injury and surgery was 36 (range 6–240) months.

In the 17 cases of chondral and OCL’s, the diagnosis was made on clinical grounds in 13 (76%). The one case of an OCL with no clinical features also had a normal radiograph. Also included are the numbers of cases that were clinically evident before arthroscopy and those identified de novo at surgery. The median time between injury and surgery was 36 (range 6–240) months.

In the 17 cases of chondral and OCL’s, the diagnosis was made on clinical grounds in 13 (76%). The one case of an OCL with no clinical features also had a normal radiograph. In six patients, loose bodies were not detected preoperatively on either clinical or radiographic grounds. Three of these had chondral lesions and two had anterior impingement osteophytes. The loose bodies were small and cartilagenous with no calcified matrix.

Table 1
The spectrum of pathology coexistent with lateral ankle instability in patients undergoing ligament repair

<table>
<thead>
<tr>
<th>Pathology</th>
<th>Number of cases with pathology identified at surgery</th>
<th>Number of cases diagnosed preoperatively</th>
<th>Number of cases diagnosed at operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-articular pathology requiring intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolated chondral lesions</td>
<td>11 (19%)</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Osteochondral lesions</td>
<td>6 (10%)</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Loose bodies</td>
<td>14 (24%)</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Anterior osteophytes</td>
<td>24 (41%)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Soft tissue impingement/synovitis</td>
<td>49 (84%)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Peroneal tendon pathology requiring intervention</td>
<td>11 (14%)</td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

– Insufficient data to reliably subdivide.
Of the cases with peroneal tendon pathology, four cases (36%) with tears were identified at surgery without prior diagnosis.

4. Discussion

The surgical aim of ankle stabilisation is to produce not only a stable ankle but also one that is pain free allowing for normal function. A number of authors have suggested that ongoing symptoms following ankle stabilisation can be attributed to other intra or extra-articular pathology that has been overlooked [3,6,10]. Thus it is essential to be clinically vigilant for associated pathology and to address it at the time of stabilisation. This important message needs disseminating to all healthcare professionals allied to treating ankle injuries.

Pertinent points obtained in taking a history are (i) the mechanism of injury and (ii) the ability or otherwise to bear weight on the injured ankle. The use of crutches following an ankle injury with no apparent fracture, we feel, is an important indicator of significant injury to the articular surfaces of the ankle. In addition to ongoing pain and swelling between episodes of instability, these symptoms justify further investigation.

All our patients had clinical evidence of instability of the lateral ligament complex of the ankle. Mechanical and functional instability with failure of appropriate non-operative measures are indications for surgical stabilisation. In our view, clinical assessment of mechanical instability is more reliable than pre-operative stress radiography, a view shared by others [9,11]. Our practice is therefore to perform weight-bearing radiographs but not stress views as part of a pre-operative assessment.

A comparison of our data to other published results is shown in Table 2. The incidence of intra-articular pathology and peroneal tendon pathology is comparable. Only one group of authors [5] sought for both intra and extra-articular pathology but they examined the ankle joint via an arthrotomy. Most surgeons would now favour arthroscopy over arthrotomy for improved visualisation and reduced morbidity.

Twenty-one patients in our study did not undergo arthroscopic assessment. In those patients with no pain or swelling between episodes of instability, and normal imaging, arthroscopic assessment of the ankle joint was not considered necessary. That said, three of 11 patients (27%) of patients with chondral lesions, one of six (17%) with an OCL and six of 14 (43%) with loose bodies had pathology identified at surgery without a preoperative diagnosis (Table 1). None of these patients had an MRI. Others have also shown that chondral lesions in particular are often only diagnosed at arthroscopy [4]. It would therefore seem prudent to arthroscopically all patients prior to ankle stabilisation, unless they are asymptomatic and an MRI is clear of chondral pathology.

The other authors listed in Table 2, who examined for peroneal tendon pathology, noted a higher incidence (23–25%) than in our study (14%). Our study population may therefore reflect an underestimation of the true incidence of peroneal tendon pathology, further confirming our view that the peroneal sheath be opened in all cases of lateral ligament repair. It is unclear from our results if the tears to the peroneal tendons were more likely to have occurred at the time of initial injury or as the result of repeated episodes of instability. The median time between initial injury and surgery was 24 months with five patients presenting within 9 months and the rest over 24 months. As continued instability is detrimental to an already damaged tendon [13], early surgical ankle stabilisation and peroneal tendon debridement is advisable.

The benefits of the standard anterior curvilinear incision for a Brostrom type repair are that the incision results in a cosmetically acceptable scar [9] and exposure of the lateral ligaments is good. However, the incision is not internervous, placing the lateral branch of the superficial peroneal nerve at risk, and it is not extensile along the line of the peroneal tendons.

The majority of authors who have recommend a longitudinal approach to the peroneal tendons did so because they utilised the tendons as part of a non-anatomic

<table>
<thead>
<tr>
<th>Authors</th>
<th>Number of subjects</th>
<th>Percentage incidence of intra-articular pathology at arthroscopy</th>
<th>Percentage incidence of peroneal tears at inspection (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>This paper</td>
<td>79 (58 underwent Ax)</td>
<td>29 (Chondral and osteochondral lesions) 24 Loose bodies 41 Anterior bony osteophytes</td>
<td>14</td>
</tr>
<tr>
<td>[1]</td>
<td>46</td>
<td>13 Chondral and osteochondral lesions 13 Loose bodies 20</td>
<td>–</td>
</tr>
<tr>
<td>[3]</td>
<td>55</td>
<td>38 Chondral and osteochondral lesions 22 Loose bodies 11</td>
<td>–</td>
</tr>
<tr>
<td>[10]</td>
<td>31</td>
<td>93 Chondral and osteochondral lesions – Loose bodies –</td>
<td>–</td>
</tr>
<tr>
<td>[12]</td>
<td>30</td>
<td>66 Chondral and osteochondral lesions 20 Loose bodies –</td>
<td>–</td>
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</tbody>
</table>
reconstruction [6,7]. The point has been made, however, that this approach has advantages when performing an anatomical repair [5,8].

In conclusion, our data reveal that we are justified in our practice of performing ankle arthroscopy prior to lateral ligament repair, particularly if an MRI has not been performed. In addition, due to a significant proportion of peroneal tendon pathology being diagnosed only at surgery, we would recommend an extensile, internervous approach to the distal fibula approach in all cases of lateral ligament repair.

References