Posteromedial meniscocapsular injury associated with rupture of the anterior cruciate ligament

A PREVIOUSLY UNRECOGNISED ASSOCIATION

S. R. Bollen

From Bradford Teaching Hospitals Trust, England

While injury to the posterolateral corner is accepted as a relatively common occurrence associated with rupture of the anterior cruciate ligament, posteromedial meniscocapsular injury has not previously been recognised as such. In a prospective assessment of 183 consecutive reconstructions of the anterior cruciate ligament this injury was observed in 17 cases, giving it an incidence of 9.3%. Clinically, it was associated with a mild anteromedial rotatory subluxation and it is important not to confuse this with posterolateral rotatory subluxation. In no case was this injury identified by MRI. The possible long-term clinical relevance is discussed.

A posteromedial meniscocapsular injury was observed in the course of an arthroscopic assessment before reconstruction of the anterior cruciate ligament (ACL) (Fig. 1). Because of the uncertainty of the nature of this lesion a photograph was circulated to other surgeons with a special interest in soft-tissue injuries of the knee. None had previously seen anything similar and no previous description or association of this lesion with injury to the ACL was found in the literature. A similar lesion was observed two weeks later and the incidence was then recorded prospectively.

Patients and Methods

Over a period of 14 months the posteromedial recess of all isolated reconstructions of the ACL was carefully inspected and the presence or absence of a posteromedial meniscocapsular separation noted (Fig. 2). The findings at examination under anaesthesia were recorded. In addition, during the same period, all other arthroscopic procedures had the same careful inspection as part of the initial assessment of the joint.

Results

Posteromedial meniscocapsular separation was identified in 17 of 183 isolated reconstructions of the ACL, giving an incidence of 9.3%. In all cases there was an associated mild anteromedial rotatory subluxation. With the knee at 90°, external rotation of the foot was increased due to the medial tibial plateau rotating forward. No similar lesion was seen in over 700 knees which had an arthroscopy for any reason other than deficiency of the ACL in the same period.

Discussion

While an injury to the ACL with an associated injury to the medial ligament complex and medial meniscus has been recognised for over 50 years, this specific injury has not previously been reported in association with injury to the ACL. This is probably because its identification would require the arthroscope to be passed between the posterior cruciate ligament (PCL) and the medial wall of the intercondylar notch into the posteromedial recess and then rotated through 90°. In addition, the medial meniscus is not displaceable and is stable to probing.
POSTEROMEDIAL MENISCOCAPSULAR INJURY ASSOCIATED WITH RUPTURE OF THE ANTERIOR CRUCIATE LIGAMENT 223

There is no obvious bucket-handle tear because in all the cases the tear extends laterally from approximately the junction of the middle and posterior thirds of the meniscus to a condensation of the capsule, forming a U-shaped structure around the posterior aspect of the PCL. This condensation of the capsule forms a ligamentous-like structure which runs up on to the posterior aspect of the medial meniscus (Fig. 3) and provides an additional anchorage to the posterior horn of the medial meniscus. It is not a named structure in textbooks of anatomy.

MRI was performed in 11 cases and failed to identify the injury. This is presumably because this investigation is performed with the knee in near extension, when the menisco-capsular separation is reduced. This is similar to a failure of MRI to identify a reduced bucket-handle tear.

It is supposed that this lesion is associated with a mild anteromedial rotatory subluxation, which, if not recognised and confused with posterolateral rotatory subluxation, could lead to a serious error in surgical decision-making. The dial test to identify rotatory subluxation was originally described with the patient in the supine position, but in the United Kingdom is now usually performed with the patient prone. In the latter position it is impossible to distinguish whether the lateral tibial plateau is rotating backwards or the medial tibial plateau is rotating forwards. Although anatomical and biomechanical studies of the medial and posteromedial structures have been previously described, none have analysed the biomechanical effect of this lesion in association with a rupture of the ACL.

It is not known at present what the long-term sequelae of this lesion may be. The general principle of repairing or reconstructing all damaged structures was proposed by Palmer in 1938 and still holds true today. With current technology, the only way of repairing the lesion is by using a posteromedial arthrotomy and it is not known if the morbidity of doing this is justified by the improvement in outcome. Standard inside-inside or inside-outside techniques of meniscal repair are not feasible, since the only way of visualising the lesion is with the knee in at least 90° of flexion and the only way of reducing it is with the knee in extension. Clearly, further work is required to clarify the long-term clinical relevance of this observation, but since there is a clinically detectable laxity associated with it, this may eventually cause a problem. Now that this association has been recognised, it is to be hoped that this will stimulate further studies.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

References