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Internal Derangement of the Knee [Abridged]

Professor Albert Trillat
(Lyon, France)

Treatment of Osteochondritis Dissecans of the Knee

In osteochondritis dissecans of the knee sequestration of an osteocartilaginous area of the articular surface of the femoral condyle takes place. At first, this presents as a softened area of cartilage which is no longer firmly attached to the underlying bone. As the condition progresses this sequestrum becomes loosened and finally presents as a separated loose body in the joint.

Various operations on the abnormal area before it has become detached have been described. In my experience simple removal has proved unsatisfactory. I then tried Smillie's method of pinning the partially detached fragment back into position but again I was dissatisfied with the results. In one case treated by Smillie's technique, although the patient had been symptom free for six years an X-ray showed appearances similar to the pre-operative state. At a further operation it was evident that there was no bony union between the underlying bone and the fragment which was then removed. Although the patient is still symptom free X-rays taken nine years after the first operation show arthritic changes in the joint.

In my opinion Smillie's method is not satisfactory because: (1) There is often no bone in the detached fragments; (2) the underlying bone often appears to be necrotic; and (3) the bony part, when present, of the detached fragment is often fragmented so that the pin cannot obtain a firm hold.

In 1958 I met Kenneth Pridie and was impressed with the results in patients with arthritic knees who had been operated on by a method devised by him. This consisted in extensive drilling of the articular cartilage and bone.

Since then I have used a similar method in the treatment of osteochondritis dissecans, removing the partially detached fragment and drilling the floor of the cavity and surrounding area.

Of 32 cases operated on by Pridie's technique, 21 have been followed up for two or more years, and of these 18 have been entirely satisfied with the results, being able to take part in all activities including vigorous sports. Of the 3 unsatisfactory results, one patient has pain and an effusion, one instability and one arthritic changes.

Before drawing definite conclusions as to the results of this method of treatment a longer period of follow-up is essential.

Professor I S Smillie
(Department of Orthopaedic Surgery,
University of Dundee)

The Current Pattern of the Pathology of Meniscus Tears

In the course of 7,000 meniscectomies the average age has risen from 27.6 years in 1940 to 39.8 years in 1966. This increase in age has been accompanied by changes in the pathology and in the related symptom complex.

Meniscus tears can be classified into those predominantly longitudinal and those predominantly horizontal. Analysis of 3,000 cases (M3500 to M6500) (see Table 1) showed that 36% (average age, 31) were longitudinal and 50% (average age, 43) were horizontal.

Longitudinal tears: The longitudinal tear is essentially but not exclusively an injury of youth occurring in normal fibrocartilage as a result of abnormal strain imposed usually in the course of athletic activity. The importance of the lesion on the medial side is not only the loss of function but also the future welfare of the joint, in terms of rupture of the anterior cruciate ligament from interference with the screw-home movement and destruction of the articular cartilage of the femoral condyle from direct pressure. The clinical features of this, the classical meniscus tear, do not require repetition. Once the diagnosis is established the sooner meniscectomy is performed the quicker the recovery and the better the long-term result.

Table 1

Classification of tears in 3,000 meniscectomies (M3500 to M6500)

	<i>No. of cases</i>
<i>Tears predominantly longitudinal</i>	
<i>Medial:</i>	
Peripheral or extraperipheral	177
Posterior segment	75
Complete	592
Anterior segment	5
<i>Lateral:</i>	
Peripheral or extraperipheral	139
Posterior segment	25
Complete	64
Anterior segment	17
	1,094 (36%)
<i>Tears predominantly horizontal</i>	
<i>Medial:</i>	
Posterior segment	1,257
Middle segment	25
Anterior segment	14
<i>Lateral:</i>	
Posterior segment	62
Middle segment (parrot-beak tear)	129
Anterior segment	21
	1,508 (50%)
<i>Congenital discs</i>	185
<i>Other (Cysts without tears, no lesion, &c.)</i>	213

Horizontal tears: The horizontal tear is essentially a lesion of middle age, occurring in abnormal fibrocartilage. In the form affecting the posterior segment of the medial meniscus it is the commonest lesion encountered in the knee (*see* Table 1). The fibrocartilage of the substance of the structure undergoes degeneration. Movement, instead of taking place between condyle and meniscus, begins to occur within the substance, so that the superior surface moves on the inferior: after a trivial injury such as a twist, but often for no reason at all, the fibrocartilage gives way with the onset of symptoms. The importance of the lesion is that the symptoms are less well known and differ markedly from those of the longitudinal tears and are thus liable to misinterpretation. The age of the patient, the absence of injury, effusion and locking, the nature, site and timing of the pain, all tend to the erroneous diagnosis of arthrosis.

The reason for the unexpected rapidity of recovery and favourable prognosis following early meniscectomy is that adjustment of joint mechanics, whereby opposing articular surfaces are in closer proximity, has occurred gradually in the preceding months or years and not suddenly as when a meniscus of normal thickness is removed from the knee of a young subject. In the degenerative lesion, operation merely removes an obstructing irregularity from between the weight-bearing areas of the condyles.

Professor Albert Trillat
(Lyon, France)

Osteochondral Fractures of the Knee

If one restricts oneself to the study of cases where there has been a complete or partial dislocation of the patella three possible lesions may occur: (1) Rupture of the medial patellar retinaculum. (2) Osteochondral fracture of the medial part of the patella. (3) Osteochondral fracture of the lateral femoral condyle. Bearing these possibilities in mind, if an adolescent or young patient, often a girl, has injured a knee by rotation and there is a persistent effusion without signs of meniscal injury or radiological abnormality, the possibility of an osteochondral fracture must be considered. If the effusion persists for more than four weeks the knee should be explored both on the medial side of the patella and the lateral femoral condyle. If a lesion is discovered in either situation the joint should be carefully examined for a loose body. Similarly, when operating on such a knee for the removal of a loose body the medial side of the patella and the lateral femoral condyle should always be examined.

I agree with Smillie and Milgram that osteochondral and even chondral fractures are often undiagnosed or diagnosed too late. If one remembers the possibility of a partial or complete dislocation of the patella associated with an osteochondral fracture in teenagers, early operation may produce better results than hitherto.

Professor I S Smillie
(Department of Orthopaedic Surgery,
University of Dundee)

Internal Derangements of the Knee-joint in Women

In internal derangements of the knee-joint, there are certain features, differences in pattern and additional problems of diagnosis peculiar to women.

Incidence of meniscectomy: There were 780 females in 7,000 meniscectomies. In recent years the ratio of women to men has remained constant: one in six.

Age: The average age of the women was 42 as opposed to the overall average age of 39. This is in keeping with the statement that these lesions are commonly of degenerative origin (*see* Table 1, on this page).