DISLOCATION OF PATELLA AND ITS RELATION TO CHONDROMALACIA PATELLAE*

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The purpose of this paper is to put forward a twofold suggestion. Firstly, that traumatic outward subluxation of the patella, due to rotational strains of the knee, is a more common injury than is often thought; and, secondly, that such subluxations, if recurrent, especially in the young adult male, are a common cause of the development of chondromalacia patellae.

We all would, I think, accept that "torn cartilage" is a diagnosis made far too easily and too often in the medical world in general. At the wartime orthopaedic centre at Park Prewett Hospital, Basingstoke, we found that, of 300 Service men sent to us with a diagnosis of "torn cartilage," in only approximately 60 was this diagnosis in our view correct. But even after the most careful and thorough examination mistakes are made, and there must be very few, if any, orthopaedic surgeons who will not admit that from time to time they have explored a knee-joint, confident of finding a torn medial cartilage, and found in fact no obvious abnormality.

It is submitted that in a proportion of such cases the correct diagnosis is primary or recurrent subluxation of the patella, and, furthermore, that in the case of recurrent subluxations a careful examination will in certain cases reveal evidence of chondromalacia patellae which operative findings will confirm, or alternatively, if clinical evidence of chondromalacia patellae is found, that careful examination may reveal an accompanying instability of the patella.

Points in Diagnosis

In the investigation of a recent knee injury an exact description of the injury and an accurate location of the tenderness present are all-important in arriving at a correct diagnosis. From the history we learn how the injury occurred—while running or while stationary, with the weight on or off the leg, with the knee flexed or extended—and if possible we discover what rotational forces were in action at the time. We gauge its severity by the patient's reaction to it—for example, whether or not he could continue a game being played at the time. We note whether the knee swelled rapidly and painfully—suggesting a haemarthrosis—or more slowly, as when fluid only is exuded. We question critically any suggestion of locking and determine whether, in fact, true locking occurred.

Some patients, in fact, say, "My kneecap seemed to go out of place," but if this observation was not confirmed by others and seemed to be only a transitory phenomenon we are perhaps inclined to discount it. It may nevertheless be true, and, if made, the patient should be further questioned about the statement.

When a knee is examined shortly after an injury, especially in a primary injury, the most useful single sign is the exact location of the site of tenderness. In the case of an acute primary subluxation of the patella, if a careful examination is not carried out shortly after the accident the local tenderness may disappear or become blurred by the general tenderness of a painful effusion.

Mr. J. S. Ellis, in a paper read at the Birmingham Meeting of the British Orthopaedic Association in October, 1953, drew attention to the fact that in all cases of acute primary subluxation of the patella there is tenderness on the inner side of the patella, *not* confined to the joint line but above it, and, furthermore, that acute pain is produced in the same situation by attempting to displace the patella outwardly.

Obviously no doubt can arise when the patient is seen with the patella still dislocated, but in most cases the dislocation is only momentary or of brief duration, and the patient presents with a painful distension of the knee due to a haemarthrosis. In 10 of Ellis's cases proved at operation to have had such displacements with tearing of the medial capsule, in only three was the dislocation of more than brief duration and still present when first examined by a doctor.

Haemarthrosis confirmed by aspiration is not common in cartilage lesions unless the tear is peripheral, and in cartilage injuries rotation of the knee in flexion is painful, but not in the case of patellar subluxations.

If a diagnosis of acute primary subluxation of the patella is made in a young adult the treatment should be operative. If the knee is explored a tear will be found in the medial capsule and should be repaired with plecting of the capsule. If the capsular tear is not repaired sound repair does not always occur even when the condition is recognized and the limb immobilized for some weeks in plaster cast, and further subluxations may occur thereafter; these, as I hope to show, even if incomplete but recurrent, are an important cause in the development of chondromalacia patellae.

Case 1

A boy of 17 complained of recurring disability of the right knee dating from a kick against the inner side of the patella at football some weeks previously—it was reported that there had been bruising on the inner side of the knee. At the time of examination, four weeks after the causal

Patella and loose body removed from Case 1.

injury, pain was complained of, especially in going up stairs and on rotatory movements.

On examination there was tenderness medial to the patella and pain in the same situation on full flexion of the knee. There was no tenderness over the menisci, and no click or clunk on rotation in flexion. The condition was at first thought to be a rotational strain of the knee, and was treated on routine lines by physiotherapy. Subsequently, however, on two occasions, once in the gymnasium and once playing football, something was felt to "go out of place" and pain was experienced on the inner side of the knee. After the second of these incidents the joint was again examined. Once more there was no tenderness on the joint line but above it medial to the patella; on this occasion, however, there was a marked retropatellar crepitus on movement, and pressing the patella firmly against the femoral condyles on movement produced retropatellar pain. Skiagrams of the knee, including tangential views of the patella and femoral

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condyles, revealed no abnormality, but on clinical grounds a diagnosis of chondromalacia patellae was made, and, in view of the considerable disability the condition was causing, patellectomy was decided upon.

At operation, not only was there found to be a large area of chondromalacia with the typical tags of elevated and fibrillated cartilage on the patella, but on the lateral margin of the lateral femoral condyle, just where the patella would have made contact with the lateral margin of the condyle in subluxating, there was an area of osteochondritis with a small, partially separated loose body (see Fig.).

It seemed reasonable, therefore, to assume that the cause of the initial internal derangement here had been a primary subluxation of the patella and that recurrence of this displacement had led to the development of the chondromalacia.

Further Cases

The findings reported in this case have led to the re-examination of a small series of other cases.

Case 2.—A boy aged 17½, while playing football, sustained a violent blow on the knee against a goalpost. The knee was never quite comfortable in games thereafter, and six months later, on going up stairs, it began to be painful and to creak. On examination there was a painful retropatellar crepitus, and after an interval, during which no improvement occurred, patellectomy was carried out with complete relief of symptoms. Three years later, while playing football, the combined quadriceps tendon and ligamentum patellae dislocated laterally, necessitating transplantation of the tibial tubercle to the medial surface of the tibia: at operation it was noted that the medial part of the capsule was thin and lax, although the repair of the quadriceps tendon to the ligamentum patellae was firm and strong.

Case 3.—A man aged 20 complained of recurrent pain and effusion in his knee and gave a history of a kick on the knee six years previously, stating that "something went out of place." Similar displacements with pain on the inner side of the knee occurred on several occasions four years later while undergoing routine training in the R.A.F.; the knee was explored for a torn cartilage and a normal cartilage was removed. When seen two years later there was again a painful retropatellar crepitus, so disabling that he could do only sedentary work. Patellectomy was advised and a chondromalacia patellae found. The patella was removed, with relief of symptoms. Six months later, while cycling, the knee suddenly locked and there seems to be little doubt that this locking was due to a lateral subluxation of the quadriceps mechanism. Transplantation of the tibial tuberosity was carried out, and in the subsequent two years he has not complained of any symptoms other than some weakness attributable to the loss of the patella.

Case 4.—A man aged 26 was invalided out of the Army five years previously with a diagnosis of acute rheumatism, based apparently upon bilateral effusions into the knee-joints. He presented with undoubted bilateral subluxating patellae, from his own description, although the locking was never more than transitory. At operation both patellae showed marked chondromalacic changes.

Discussion

Since I became interested in this subject my attention has been directed to the fact that the fat Fröhlich type of adolescent, with bilateral genu valgum, not infrequently complains of intermittent attacks of pain, sometimes with effusion, into the knee.

Are not these attacks probably due to transient subluxation of the patella? In one such case under the care of my colleague Mr. J. D. Wilson, of Lord Mayor Treloar Orthopaedic Hospital, Alton, recurrent attacks of effusion over five years have recently been proved to be associated with severe bilateral chondromalacia patellae, and a careful re-questioning of the patient suggests that the recurrent effusions may have been due to recurrent subluxation.

Until the publication of the paper on chondromalacia of the patella by Wiles, Andrews, and Devas in 1956, the literature of the condition was somewhat scanty.

N. S. Gunning, of Adelaide, Australia, at the Annual Meeting of the Australian Orthopaedic Association in 1948, reviewed the results of 25 cases of chondromalacia patellae treated by operation. He stated that the cause remained obscure and the condition might be the result of trauma or of chronic infection of the knee-joint. Interestingly, he noted that there was often post-operative tenderness over the lateral margins of the lateral femoral condyle.

Wiles, Andrews, and Devas review the incidence, natural history, pathology, aetiology, and clinical features in relation to 65 cases treated for the condition at the Middlesex Hospital and also draw attention to the presence of the condition in some degree in 48 out of 166 patients upon whom a meniscectomy was performed. It is their view that trauma is of importance more often as an aggravating than as a primary factor, and that it acts by disrupting already degenerate cartilage.

It is submitted that traumatic subluxation of the patella, with tearing of the capsule medial to the patella, is not only a more common injury than is often appreciated but also that undiagnosed recurrent subluxations may well be a not uncommon, although not the only, cause of progressive damage to the patella, and that this recurring damage may well initiate the series of changes in the cartilaginous covering of the patella culminating in the condition known as chondromalacia patellae.

REFERENCES

- Gunning, N. S. (1948). *J. Bone Jt Surg.* 30B, 730.
Wiles, P., Andrews, P. S., and Devas, M. B. (1956). *Ibid.*, 38B, 95.

Preparations and Appliances

A NEW ANAESTHETIC TABLE

Dr. R. W. COPE, consultant anaesthetist, University College Hospital, London, writes: Several of the anaesthetic tables in current use are most inconvenient, and it is suggested that the following criteria should always be fulfilled.

(1) The whole apparatus should be so mobile that only a light touch is necessary. (2) The table top should be of a good size, so that adequate space is reserved for a few syringes, in clear view of the anaesthetist, and some form of simple ampoule-holder is provided. There must also be room for his blood-pressure machine and stethoscope. (3) One of the most important

single factors in the safe running of an anaesthetic for a prolonged major procedure lies in making a written record of changes in the patient's physiology, especially blood pressure. The table top should have a flat space which is primarily intended for the anaesthetist to write upon and upon which he may preserve his notes.