POSTERIOR PERIPHERAL DETACHMENT OF THE LATERAL CARTILAGE

E. A. JACK, EDINBURGH, SCOTLAND

This paper describes a lesion of the attachments of the lateral cartilage which, it is considered, deserves description as a distinct clinical and pathological entity. Although it seems probable that most surgeons concerned with knee joint surgery recognise the lesion, and, in fact, McMurray (1942) described it as "the commonest pathological condition of the external cartilage," it has not hitherto been given individual identity, but has been grouped indiscriminately from a clinical point of view, with tears in the substance of the cartilage.

The peripheral attachments of the lateral cartilage differ from those of the medial in that their continuity is broken by the passage of the femoral tendon of popliteus. This tendon enters the joint through a synovium-lined tunnel and lies in direct relationship with the rim of the lateral cartilage which it grooves obliquely. There is a hiatus in both superior and inferior coronary ligaments to permit its passage. The lesion consists of a tear of the synovial reflection and coronary ligaments backwards from the hiatus so that the posterior half of the intact cartilage loses its peripheral anchorage and is able to slip forwards into the joint (Fig. 1).

Interest in this condition was aroused eight years ago by the case of a soldier of twenty who complained of intermittent locking incidents in both knees, due clinically to lesions of the lateral cartilages. At operation the cartilages were found to be intact, but once dissection had proceeded to the hiatus for the popliteus tendon, they could be pulled forwards easily and displaced completely across the centre of the joint, remaining attached only at the posterior horns. Symptoms dated from an occasion when he had been obliged to kneel crouched down, sitting on his heels, in a slit trench for half an hour during a bombing attack. Attempting to rise, he found both knees locked in flexion and he was unable to proceed until a companion had pulled them straight. Thereafter locking incidents recurred which he learnt to overcome himself by kicking the knees straight. Not long afterwards an almost identical case was encountered in a boy of sixteen who had hidden under a bed during a game of hide-
and-seek, and who was unable to rise when found until his sister had pulled his legs straight. Since then cases of a similar nature and with the same operative findings have cropped up with sufficient regularity to render the condition familiar.

**CLINICAL FEATURES**

The lesion tends to occur in relatively young patients and may be bilateral. The original incident that initiates the tear is not always so clear-cut as in the two cases quoted above, but there is commonly a story that the first attack of pain, situated in the postero-lateral aspect of the joint, developed after a period of relaxation with the knees fully flexed—for instance, after squatting on the heels for some time. It may be possible to identify in the story a medial rotation twist of the tibia. For a few days after this initial incident there is a mild synovitis with effusion, and a typical point of tenderness at the level of the cartilage behind the lateral ligament. Movements of the knee are normal and McMurray’s sign is negative.

Thereafter the complaint may be of minor “catching” in the joint with transient postero-lateral pain. True locking occurs later as the tear extends. The knee locks in rather more flexion than is usual, often about ninety degrees, and release is easy and complete by a simple straight pull. In this respect the lesion differs in its behaviour from a tear in the substance of the cartilage.

**PATHOLOGICAL ANATOMY**

A characteristic feature at operation is the ease with which the cartilage is removed: the difficult part of the operation is already performed. Through a lateral parapatellar incision the anterior half of the cartilage looks normal and there may be a temptation to look elsewhere for the source of trouble. As dissection approaches the popliteus tendon it is common to find a small zone of hyperaemic reaction in the synovial membrane at the anterior edge of the hiatus. When the hiatus is reached the cartilage pulls forwards across the joint and division of the posterior horn releases it completely.
The normal curvature of the posterior half of the cartilage may be flattened by repeated forward displacement. The synovial reflection is found to be absent from the popliteus hiatus backwards, and the superior rim is rounded off by the persistent over-riding of the femoral condyle (Fig. 2).

**MECHANISM OF INJURY**

It seems reasonably certain that exaggerated flexion of the knee is the important element in the production of the lesion, combined possibly with medial rotation of the tibia. In flexion the condyle of the femur rolls back on the tibial plateau so that at the extreme range, it rests almost on the posterior edge. Medial rotation of the tibia tends to accentuate the position on the lateral side of the joint. A recent paper by Last (1950) described how the lateral cartilage normally escapes injury in this position. The medial half of the popliteus muscle is inserted by a fibrous aponeurosis directly into the posterior rim of the cartilage, and draws it back over the rounded edge of the tibial condyle as the knee flexes (Fig. 3). Last’s description of this attachment and function of the popliteus has been verified in a series of dissections in freshly amputated limbs.

The occurrence of bilateral lesions, and the youthful age at which they appear, may imply a structural predisposition to the lesion either in the form of laxity of ligaments or possibly anomalous insertion of the popliteus. Whatever the factor, the popliteus action seems to become temporarily ineffective and the cartilage slips forwards and swings medially on the ligaments of Wrisburg and Humphrey, so that it becomes trapped between the condyles. When straightening is attempted the cartilage is dragged farther into the joint and its peripheral attachments give way at the weak point at the edge of the popliteus hiatus. Subsequent episodes enlarge the rent until the popliteus attachment and all peripheral attachments behind the hiatus are torn away, and the posterior half of the cartilage is released from control.

**REFERENCES**
