POPLITEAL ANEURYSM AFTER LATERAL MENISCECTOMY

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The intimate relation between the lateral inferior genicular artery and the posterior capsule of the knee joint puts the artery in hazard during operative removal of the lateral cartilage. Although damage to the artery at operation, with the subsequent development of an aneurysm in the popliteal fossa, appears to be a recognised complication of lateral meniscectomy, few cases have ever been described in surgical literature. Elkin (1948) described one case and Fairbank and Jamieson (1951) have described two cases in which the artery was damaged while passing within the joint capsule. In the case to be described the lesion assumed the appearance of a saccular aneurysm of the popliteal artery although it arose, in the first instance, from the lateral inferior genicular artery. The purpose of this paper is to describe the production of such an aneurysm and to discuss the treatment.

CASE REPORT

A man of twenty-seven years was admitted with the typical features of a lesion of the lateral semilunar cartilage. The cartilage was excised through a straight incision at the lateral side of the patella, a tourniquet being used. There were two tears of the free margin

Fig. 1
The antero-posterior angiogram (Fig. 1) shows the displacement of the popliteal artery. The lateral view (Fig. 2) shows the stump of the lateral inferior genicular artery and the ill-defined shadow made by the contrast material in the aneurysmal sac posterior to it.
of the cartilage. Difficulty was experienced in removing the posterior half. After the operation a pressure bandage was applied, but when the tourniquet was released bright red blood seeped rapidly through the dressings. The dressings were removed and a quantity of bright blood was expressed from the wound. It was observed that the joint itself was not distended. Fresh dressings were applied with firmer pressure. These dressings also became stained, but further observation indicated that the bleeding was controlled and the patient was returned to the ward. Convalescence was uneventful until the tenth day after operation, when the dressing was removed to reveal a pulsating swelling on the posterior aspect of the knee. Six days later the swelling had become rounded and more defined, although it could not be distinguished from the lateral head of the gastrocnemius muscle. Compression of the femoral artery in the upper thigh arrested the pulsation. The distal part of the limb showed little change. The veins over the dorsum of the foot became congested when the limb was dependent, but the colour of the foot was satisfactory and good pulsation was felt in the posterior tibial and dorsalis pedis arteries.

**Angiography** (Dr K. Jamieson)—The injection was made into the femoral artery at the lower end of the femoral canal, while the femoral artery was compressed proximally. The popliteal artery was shown to be displaced medially and, opposite the joint space, there was a constriction of its lumen (Figs. 1 and 2). The constriction was entirely in the transverse diameter of the vessel. The findings suggested that the popliteal artery was stretched over an aneurysm on its lateral aspect. The communication with the aneurysm was not demonstrated, because the amount of opaque fluid which passed into the aneurysmal sac was inadequate for contrast, the peripheral part of the aneurysm being ill defined. But it was possible to show the proximal part of the inferior lateral genicular artery, which appeared as a stump-like projection four millimetres long at the level of the joint space (Fig. 2). There was a good flow of blood to the distal part of the limb. From the evidence obtained it seemed that the aneurysm originated from the inferior lateral genicular artery close to its origin from the popliteal artery, and was distorting but not obstructing the popliteal vessels. Retrograde angiography immediately before operation upon the aneurysm did not provide any further information.

**Operation**—The popliteal fossa was exposed and the aneurysm defined. It lay on the lateral aspect of the popliteal artery, to which it was adherent. The stump of the inferior lateral genicular artery was found to be completely taken up in the wall of the aneurysm and it was impracticable to define a neck between the popliteal artery and aneurysmal sac without risk of tearing the main vessel (Fig. 3). Proximal ligation of the entering vessel being thus impossible, the aneurysmal sac was opened and its proximal orifice occluded by oversewing with fine silk sutures. A second layer of silk sutures brought the surrounding part of the wall over this suture line and finally the walls of the aneurysm were brought together with catgut sutures. The peripheral circulation remained normal and the post-operative course was uneventful.
DISCUSSION
Anatomy—The exact relationship of the inferior lateral genicular artery to the posterior part of the joint capsule varies slightly, but this variation is sufficient to make the vessel vulnerable during operation in one subject whereas, in another, damage to the vessel is unlikely because the vessel lies below the level of the joint space. In our patient the vessel arose from the popliteal artery immediately behind the posterior attachment of the lateral cartilage and a similar relationship was observed in two of three cadavers examined.

Technique of meniscectomy—It has always been suspected that the use of Smillie’s cartilage knife is fraught with danger. On one other occasion the knife was felt to pass through the capsule posteriorly, fortunately without any serious result. The knife was not felt to pierce the capsule in the present case and it is not clear at what stage the injury to the artery took place.

Angiography—The angiogram was valuable in determining the type of lesion, but the poor contrast within the aneurysmal sac was disappointing. More experience and a better radiographic technique might have led to better results when the retrograde filling of the popliteal artery from the aneurysm was attempted.

Treatment—The critical point to be determined is the point of origin of the aneurysm and its relation to the popliteal artery. If the sac arises directly from the popliteal artery there is a serious risk of occlusion of the artery when the aneurysmal sac is obliterated, and in such a case it would be wise to delay operation until the collateral circulation could be established, and a coincident lumbar sympathectomy should be undertaken, if necessary, to tide the patient over the early period after occlusion of the popliteal artery.

If the aneurysm is shown to arise from the inferior lateral genicular branch, the ease with which it can be dealt with will depend upon the length of the proximal part of the branch and the secondary changes that have taken place in the wall of the aneurysm. In such cases early operation is likely to permit easier and more satisfactory operative repair.

Operative technique—Although ligation of the entering vessel and excision of the sac may be considered the method of choice in dealing with saccular aneurysm, whether this be of the false or true variety, the ease with which a satisfactory result may be obtained by endo-aneurysmorraphy reinforces the view recently expressed by Rogers (1951), who described three cases in which this method was used. In accessible situations like the popliteal space, where dissection can be readily carried out and vessels controlled either by arterial clamps or digital pressure, it is easily practicable to open the sac and occlude the arterial openings on the inside with little loss of blood.

SUMMARY
1. A case of traumatic aneurysm in the popliteal fossa after a lateral meniscectomy is described.
2. Relevant factors in the surgical anatomy of the inferior genicular artery are discussed.
3. The value and limitations of angiography of the popliteal artery are considered.
4. Treatment is governed by the degree of involvement of the popliteal artery. In the case described cure of the aneurysm was obtained by endo-aneurysmorraphy.

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REFERENCES

