TRAUMATIC ANEURYSM OF THE ANTERIOR TIBIAL ARTERY

Report of a Case

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Although fractures of the uppermost third of the tibia and fibula are common, associated injury of the anterior tibial artery is rare. We report such a case because of its rarity, the difficulty of early diagnosis and the problems of management. A similar case was reported by Stein (1956).

CASE REPORT

A woman of seventy-one was admitted in April 1960, having been knocked down by a car. She was found to have a closed comminuted fracture at the junction of the uppermost and middle thirds of the left tibia and fibula (Fig. 1). There were superficial abrasions of the overlying skin and the area was tense and swollen. The circulation of the lower leg appeared satisfactory. There was no evidence of a peripheral nerve lesion. Since the position of the fragments was acceptable, manipulation was not necessary and a full length plaster was applied.

FIG. 1

FIG. 2

Figure 1—Initial radiographs. Figure 2—Eighteen weeks after injury. Union of the tibial fracture and erosion of the fibula at the fracture site.

Progress—When the plaster was changed two weeks later the leg was noticed to be greatly swollen, but no special importance was attached to this. A month after the injury the patient was discharged home walking with crutches.

FIG. 3

FIG. 4

Figure 3—Photograph showing the extent of swelling due to the traumatic aneurysm. Figure 4—Arteriographs showing traumatic aneurysm of the anterior tibial artery. The bifurcation of the popliteal artery is widened. The proximal and distal vessels appear healthy.

After eighteen weeks the fracture of the tibia was clinically united. There was a considerable local swelling of the calf which slowly increased. Complete paralysis of the lateral popliteal nerve had developed. Radiographs at that time showed union of the tibial fracture and erosion of the fibula at the fracture site (Fig. 2). The patient was readmitted for further investigations.

On examination, the left leg was much swollen in its uppermost third, the circumference being 11·2 centimetres (four and a half inches) greater than on the right side (Fig. 3). A bruit could be heard over this area. The ankle and foot were also swollen, and the lateral popliteal nerve palsy remained complete. A provisional diagnosis of an aneurysm was made and percutaneous femoral arteriography was carried out under local anaesthesia.

Arteriographic findings—A traumatic aneurysm of the anterior tibial artery was demonstrated. The sac appeared spherical, about 3·5 centimetres in diameter and situated 4 centimetres from the origin of the anterior tibial artery (Fig. 4). The bifurcation of the popliteal artery was considerably widened by the haematoma. The anterior tibial artery distal to the aneurysm was shown to be patent, as were the femoral and popliteal arteries. There was no evidence of marked atheromatous narrowing. The posterior tibial and peroneal arteries appeared healthy throughout their course, thus explaining the

FIG. 5

Eight months after operation, showing regeneration of the upper fibular shaft.

lack of circulatory embarrassment in the limb at the time of the original injury. *Operation*—The popliteal fossa was approached through a longitudinal postero-lateral incision. The medial and lateral popliteal nerves were identified; the popliteal artery was dissected free and a tape was passed around it in order to control any bleeding at a later stage. The anterior and posterior tibial arteries were exposed in the proximal two centimetres of their course, and good pulsation was felt in both. While the popliteal artery was temporarily occluded the swelling was incised and large quantities of old and fresh blood clot were evacuated. The pseudo-sac was identified and the anterior tibial artery with some of its branches was ligated. This was considered to be safe because the posterior tibial artery was patent. The wound was closed loosely and a drain inserted.

Further progress—The post-operative progress was complicated by the formation of a haematoma which required drainage on two occasions. The wound eventually healed completely. The swelling of the lower leg has gradually disappeared and the lateral popliteal nerve palsy is slowly recovering. The patient can walk with an iron and T-strap and is free from vascular symptoms. Radiographs eight months after the operation show considerable regeneration of the shaft of the fibula (Fig. 5).

DISCUSSION

It is surprising that this complication is found so seldom after fractures at this level, especially since damage to the popliteal artery by fractures nearer the knee is a well known hazard (Watson-Jones 1952).

In recent fractures in which peripheral vascular insufficiency follows, arteriography should be performed to determine the nature and site of the lesion. When there is no peripheral circulatory embarrassment but when marked local swelling persists for more than four weeks (as in the case reported here) arteriography is also indicated. In our case examination of the plain radiographs and of the arteriographs leaves little doubt that the sharp upper corner of the free triangular tibial fragment was responsible for the initial injury to the artery which led to the formation of the aneurysm.

When a diagnosis of traumatic aneurysm is confirmed operation should be carried out as soon as possible. If the posterior tibial artery is patent down to the foot the anterior tibial artery may be ligated without danger (Hughes 1958), but if the posterior tibial artery were occluded it would be advisable to attempt repair of the anterior tibial artery, either by direct end-to-end anastomosis or by the insertion of a graft, autogenous vein being the material of choice. This is a worthwhile procedure in spite of the fact that many of these repaired small vessels eventually thrombose, for during the initial period of patency time is given for the development of the collateral circulation which may save the limb.

SUMMARY

1. A case of traumatic aneurysm of the anterior tibial artery complicating fracture of the tibia and fibula is reported.
2. The diagnosis and management of such lesions are discussed.

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