CASE REPORTS

Chronic pseudoaneurysm of the popliteal artery after blunt trauma

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Blunt trauma to the popliteal artery usually results in acute arterial damage that requires urgent repair. Most blunt trauma to the popliteal artery is associated with skeletal injuries. We report a patient who had a chronic pseudoaneurysm of the popliteal artery 10 years after minor blunt trauma to the popliteal fossa. The cause of the pseudoaneurysm and suggestions for the early recognition of these arterial injuries are discussed. (J Vasc Surg 1989;10:187-9.)

Injuries to the popliteal artery after blunt trauma have been described. Intimal disruptions with thrombosis or transection are the injuries that occur most frequently.1 Most of these injuries undergo immediate repair, and chronic pseudoaneurysm of the popliteal artery rarely has been reported. This report describes a patient with a chronic pseudoaneurysm of the popliteal artery discovered 10 years after minor blunt trauma to the popliteal fossa.

CASE REPORT

A 50-year-old man was referred to our institution because he had a pulsatile mass in the left popliteal fossa. Over the preceding 12 months he had noticed a gradually enlarging mass in the left popliteal fossa, with intermittent pain at that site when walking. He was an otherwise healthy man with no past history of infectious, venereal, rheumatologic, or connective tissue disease. Ten years before he came to the Medical Center for treatment, he was struck in the left popliteal fossa by a softball. Pain in the popliteal fossa and calf caused him to remain off his feet for the next several hours. There was no skeletal injury, and the patient resumed his normal activities the next day. He did not seek medical attention at that time.

Physical examination of the patient revealed normal arterial pulses in both lower extremities. There was a pulsatile mass in the left popliteal fossa. The abdominal aorta was not enlarged, and there was no evidence of peripheral arterial embolization. A duplex scan of the left popliteal fossa revealed a 4 cm saccular aneurysm with laminated thrombus. Digital subtraction arteriography showed a saccular aneurysm proximal to the left knee joint (Fig. 1).

Preoperative segmental limb pressures and pulse volume recordings were normal bilaterally.

The popliteal fossa was explored through a posterior approach. A saccular aneurysm measuring 7 cm in length and 6 cm in width was found. The aneurysm was adherent to the popliteal vein and was compressing the tibial nerve (Fig. 2). There was no evidence of popliteal artery entrapment. When the aneurysm was opened, the posterior wall of the popliteal artery was found to be disrupted, and primary repair or patch repair was not possible. The popliteal artery was reconstructed with an interposition graft of lesser saphenous vein (Fig. 3). Completion arteriography revealed no technical problems with either the proximal or distal anastomosis. Segmental limb pressures and pulse volume recordings were normal postoperatively. Bacterial cultures of specimens obtained in the operating room showed no growth. Histologic examination was consistent with chronic pseudoaneurysm. The aneurysm consisted of a well-developed fibrous wall, without normal arterial wall components. The patient was discharged from the hospital on the fourth postoperative day.

DISCUSSION

Although we cannot prove that trauma caused this patient's pseudoaneurysm, it appears to be the most plausible explanation. A pseudoaneurysm of the popliteal artery is more likely to result from penetrating trauma than from blunt trauma. In a review of the Vietnam Vascular Registry, Rich et al.2 reported on 296 pseudoaneurysms, 28 of which occurred in the popliteal artery. Fewer than 1.2% of all pseudoaneurysms were a result of blunt trauma; however, the military experience is more likely to involve penetrating trauma than blunt trauma. In the civilian population arterial pseudoaneurysm is rarely reported after blunt trauma. In a review of their 20-year experience, Wagner et al.1 reported on 100 blunt injuries to the popliteal artery after blunt trauma.
injuries to the popliteal artery. Ninety-six percent of these injuries were associated with skeletal trauma. Fifty-five percent of the arteries had intimal injury and thrombosis, and 41% had been transected. No pseudoaneurysms were seen in this series. Most patients with popliteal artery trauma had evidence of arterial injury and underwent immediate arterial repair. Popliteal artery pseudoaneurysm after blunt trauma not associated with skeletal injury has been reported. The patient in that report sought treatment 3 months after popliteal trauma that resulted in popliteal artery thrombosis and a pseudoaneurysm. This case was complicated by needle aspiration of a popliteal hematoma immediately after the injury that may have contributed to pseudoaneurysm formation.

The popliteal artery is particularly prone to injury after skeletal trauma because it is tethered above and below the knee joint. Stretching of the popliteal artery accompanied by skeletal injuries or deformation of the popliteal artery against the bony structures of the knee can result in arterial damage. The shear and tensile forces produced in blunt trauma can cause varying degrees of arterial wall disruption. We believe that the patient in this report had partial arterial...
wall disruption that resulted in pseudoaneurysm formation. Symptoms developed when the pseudoaneurysm became large enough to compress the popliteal vein and tibial nerve.

The importance of evaluating the popliteal artery for injury in cases of dislocation or fracture around the knee has become ingrained in vascular surgical practice. The aggressive use of arteriography and noninvasive evaluation by segmental limb pressure and pulse volume recordings have resulted in the early identification and repair of traumatic arterial lesions. Problems arise in the evaluation of patients with minor trauma, such as the patient presented in this report. It is impractical to obtain arteriograms on all such patients, and limb pressures may be normal in cases of intimal injury without hemodynamic compromise. Because arterial ultrasonography has been shown to elucidate intimal injuries, we believe it may be a useful screening test in cases of minor trauma when arterial injury is not evident clinically. Combining arterial ultrasonography with pulsed Doppler spectral analysis, as in the duplex scanner, should prove useful in the noninvasive evaluation of arteries exposed to lesser degrees of blunt trauma. Ultrasonography readily detects arterial disruption with pseudoaneurysm when the presentation of vascular trauma is delayed.

REFERENCES