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Cystic Disease of Popliteal Artery

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W A B, man aged 44. Lecturer

History: Presented with six months' left calf claudication. The onset was sudden and his claudication distance was 200 metres, progressing to only 50 metres. He was asymptomatic for a period of three weeks during the last six months, and had one attack of rest pain while he was in hospital. He had no other symptoms of generalized peripheral vascular disease and was otherwise fit. He is a non-smoker and there is no relevant family or past medical history.

On examination: Fit-looking, overweight man. No abnormality in heart, chest, abdomen or central nervous system. Normotensive. Left popliteal artery easily palpable; absence of left dorsalis pedis and posterior tibial pulses. Variability of the pedal pulses was noticed at different examinations. Skin temperature and colour similar in both legs; good venous and capillary filling over left leg. Blood chemistry normal. Right retrograde aortogram showed compression and posterior displacement of left popliteal artery at level of knee joint (Fig 1); no evidence of generalized peripheral vascular disease.

Operation: The popliteal artery was explored through a posterior approach, and revealed lobular cystic enlargement involving 8 cm of the artery around its deepest surface (Fig 2). There was fibrosis around the artery which made the dissection difficult. No connexion between the cyst and the knee joint could be found. The cyst contained viscid gelatinous material. The involved segment of the artery was resected and replaced with 6 mm dacron prosthesis by end-to-end anastamoses.

Recovery was uneventful and he was discharged on the tenth postoperative day. He soon returned to work and at six months postoperative follow up he was symptom-free on exercise and his peripheral pulses were satisfactory.

Histological examination (Fig 3) showed a cyst in the arterial wall lined by a layer of flattened cells within the media and adventitial coats of the artery. There was mucinous degeneration along parts of the arterial wall and the mucinous content had the features of a ganglion.

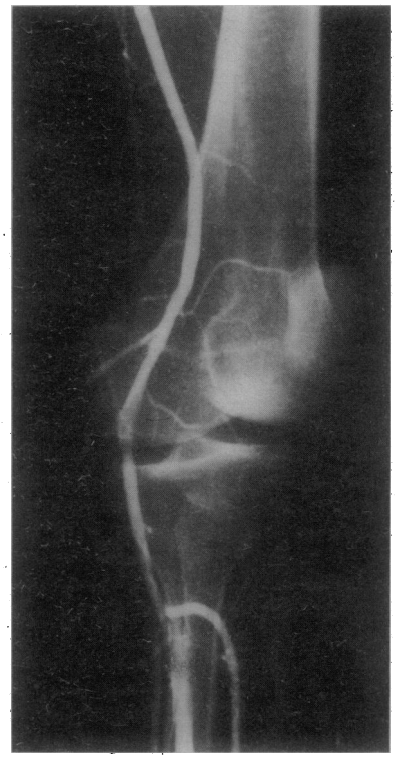

Fig 1 *Lateral view aortogram showing posterior displacement and narrowing of popliteal artery at the knee joint level*

Fig 2 *Operative photograph showing characteristic appearance of cystic disease of popliteal artery, affecting 8 cm of the vessel, with marked adhesions around the artery*

Discussion

Cystic disease of peripheral arteries is a condition characterized by the presence of unilocular or multilocular cystic spaces, containing viscid gel in the adventitial coat of the arteries. The media and intima are usually intact but any damage to them is probably secondary (Anderson *et al.* 1959). About 42 cases have been documented in the literature, the majority involving the popliteal artery at the level of the knee joint. Other arteries which have been affected are the common iliac artery (Atkins & Kay 1946) and the radial and ulnar arteries (Parkes 1961).

The sex incidence in the literature is 8 males to one female, the average age of the males being 36 years; that of the females 49. However, it has been reported in one boy of 11 years (Harris & Jepson 1965) and in another aged 13 (Lewis *et al.* 1967).

The typical clinical presentation is sudden onset of unilateral calf claudication in young adult males, usually with a progressive course. Spontaneous rupture of the cyst may give temporary relief of symptoms but sometimes the initial symptoms are episodic and pain is atypical of claudication (Barnett & Morris 1964). The variability of the pedal pulses is a recognized feature in this condition. The popliteal pulse may be absent or more palpable than normal. Sometimes visible swelling is noticed and Mentha (1965) recorded a bruit at the level of the stenosis. Exercise and knee flexion may cause disappearance of the pedal pulses.

Arteriography is essential in establishing the diagnosis which shows a localized lesion at the level of the knee joint in an otherwise normal popliteal artery. The lesion may cause stenosis, occlusion or displacement of the artery. Lateral views may show posterior displacement of the artery (Fig 1).

The clinical and radiographic appearances need differentiation from the popliteal entrapment syndrome.

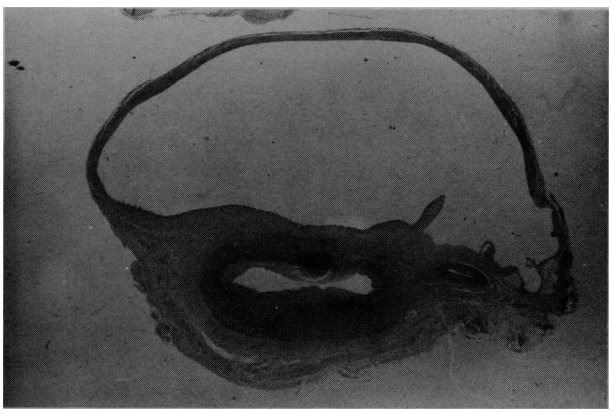

Fig 3 *Histological section showing cyst lined by a single layer of flat cells, invading the adventitia and the media of the artery*

Exploration of the popliteal artery is characteristic; the lesion appears as a well-defined lump, cystic in consistency, involving the deepest part of the artery with dense periarterial adhesions.

The only effective surgical treatment is either complete stripping of the adventitial coat with the cyst away from the vessel wall, which is applicable if the cyst is limited to the adventitial coat of the vessel, or, if the media is involved and stripping impossible, resection of the affected segment of the artery and replacement with either autogenous vein graft or a dacron prosthesis.

Many theories have been advanced regarding the etiology of this condition, the most acceptable being the developmental inclusion of synovial mucin-secreting cells in the arterial wall (McEvedy 1962). This is either the result of enlargement of capsular synovial cysts which track along a genicular artery to involve the adventitia of the popliteal artery, or of sequestration of synovial rest cells into the arterial wall during development, later to enlarge and extend.

Histological and biochemical comparison between a ganglion and this condition suggest that they might be of similar origin (Leaf 1967, Lewis *et al.* 1967). This explanation was supported by Shute & Rothnie (1973) in their two cases, when a connexion between the cyst and the knee joint was well demonstrated.

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The following case was also presented:

Erythromelalgia
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Correction
The heading of the case reported on page 223 of the March 1976 issue of the *Proceedings* should read as follows:

Bidirectional Ventricular Tachycardia in Familial Hypokalæmic Periodic Paralysis
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(for D M Krikler MD FRCP)
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