

Cystic Adventitial Disease of the Popliteal Artery Demonstrated by CT & MR Imaging : A Case Report¹

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Cystic adventitial disease is a rare vascular disease occurring most commonly in the popliteal artery. MR imaging is useful in demonstrating an adventitial cyst and compressed lumen of the popliteal artery.

Index Words : Arteries, popliteal
Arteries, MR

Cystic adventitial disease (CAD) of the popliteal artery is a rare vascular disease in which a mucinous cyst forms in the arterial wall, obstructing the lumen and producing symptoms of intermittent claudication (1). Even though several reports demonstrating radiologic features of cystic adventitial disease have been published (2-5), only one report describing the findings of magnetic resonance imaging (MRI) has previously appeared [6]. We report a case of cystic adventitial disease demonstrated by computed tomography (CT) and MR imaging.

Case Report

A 64-year-old male smoker experienced the sudden onset of pain in the left calf followed by intermittent calf claudication. The patient was suffering from mild hypertension and had a two-year history of percutaneous transfemoral coronary angioplasty. There was no history of trauma to the area. On palpation four weeks after the onset of symptoms, the left popliteal pulse was absent and the ipsilateral distal pulses were weak.

A transfemoral arteriogram revealed a smooth, crescentic obstruction in the proximal left popliteal artery (Fig. 1), with reconstitution of the distal popliteal artery via collaterals. The smooth margins of the ob-

structive site suggested an extraluminal mass.

Real-time sonography using a 5-MHz transducer showed a fusiform cystic mass, the long axis of which was oriented along the wall of the popliteal artery.

Contrast-enhanced transverse CT sections showed an ovoid, cystlike mass, 6cm long and 1.5cm in diameter, causing expansion of the arterial contour (Fig. 2).

Transverse MR sections revealed a cystic mass causing severe compression of the arterial lumen and showing homogeneous low signal intensity on T1-weighted image (Fig. 3A) and high signal intensity on T2-weighted image (Fig. 3B). The peripheral wall of the mass showed low signal intensity on T1- and T2-weighted images.

Surgery revealed a 6 cm long, fusiform cystic mass of the popliteal artery; the arterial lumen was collapsed but patent, and a mucinous material exuded from the cystic mass. The segment of artery was resected and an autogenous saphenous vein graft interposed.

Pathologic examination revealed a mucin-filled cyst with a partial, fibrotic septum in the arterial adventitia (Fig. 4) and confirmed the diagnosis of cystic adventitial disease.

Discussion

In 1947, Atkins and Key (7) first described cystic degeneration in the adventitia of an external iliac artery, and in 1954, Ejrup and Hierton (8) described this condition in the popliteal artery. Flanigan (1) summarized the findings in 115 cases of cystic adventitial disease and found that in 85% of these, the popliteal artery was affected. Cystic adventitial dis-

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Fig. 1. Arteriogram shows a smooth, crescentic obstruction of the proximal left popliteal artery and surrounding collateral vessels.

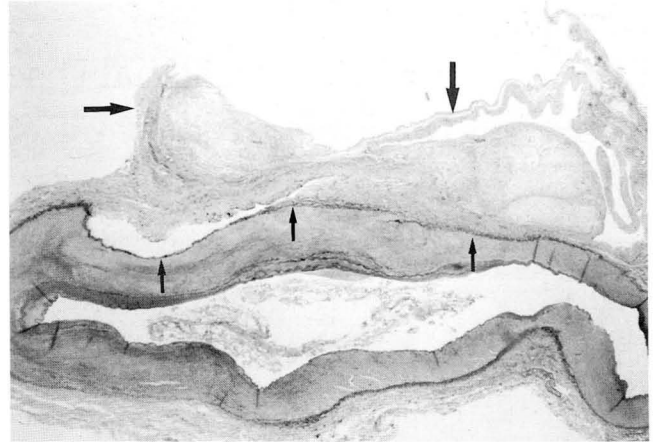
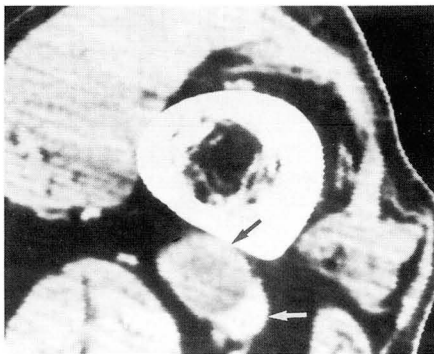
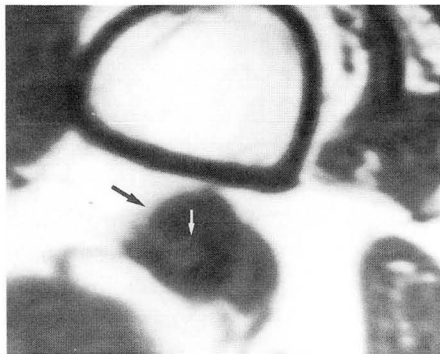


Fig. 4. Photomicrograph (Elastic-Van-Gieson stain, $\times 100$) shows mucin-filled cyst with fibrotic septum and wall (large arrows) in the adventitia of the artery. (small arrows=external elastic membrane)



2



3A



3B

Fig. 2. Contrast-enhanced transverse CT section through the upper popliteal fossa shows a cystic mass expanding the arterial contour (arrow). The compressed arterial lumen is not seen. (white arrow=popliteal vein)

Fig. 3. A. MR T1-weighted axial image at the same level of Fig. 2 shows a slitlike compression of arterial lumen (white arrow) by surrounding mass (arrow). **B.** On MR T2-weighted axial image, the contrast between the compressed arterial lumen and surrounding mass is better than T1-weighted image.

case has also been described in the external iliac (7), femoral, radial, and ulnar artery (9). The incidence is approximately 1:1200 claudicants or 1:1000 of those undergoing arteriography (9). About 85 percent of cases are male, and the average age at presentation is 42 years (1). Although many theories of pathogenesis have been proposed, the most popular belief is that the cyst is a true ganglion arising from an adjacent joint capsule or tendon sheath (10).

The typical arteriographic finding is smooth-walled stenosis, which may be curvilinear, "hour-glass", or spiral in configuration, or a smooth cre-

scentic occlusion. Location of the stenosis or occlusion in the upper portion of the popliteal artery, the absence of poststenotic dilatation, and an otherwise normal arteriogram are also typical findings (2, 4, 5). Complete occlusion, as seen in our case has been observed in 30% of patients with cystic adventitial disease (1, 10).

The sonographic and CT findings of cystic adventitial disease, including a thin-walled, cystic mass, with eccentrically compressed arterial lumen, have been described in previous reports (2, 3, 5), and these have confirmed the role of sonography and CT in the diagnosis of popliteal artery abnormali-

ties.

To our knowledge, this is the first reported case of cystic adventitial disease where both CT and MR imaging have been employed in presurgical diagnosis, although one report of MR findings has previously been published (8). In our case, MR imaging showed severe compression of the arterial lumen by a surrounding cystic mass (Fig. 3), but this was not seen on a CT scan (Fig. 2), a finding which is similar to that of Crolla (6). CT scanning, however, revealed that narrowed arterial lumen, corresponding to crescentic arteriographic narrowing, was present only at the upper margin of the cyst.

MR imaging has some advantages over CT: no contrast material; no ionizing radiation; and the availability of images other than cross-sectional ones. Additionally, MR images, especially T2-weighted, were in our case, superior to CT in demonstrating compressed arterial lumen.

In summary, MR imaging is useful in demonstrating the cystic nature of the lesion and compressed arterial lumen. For the diagnosis of cases with intermittent claudication when angiography suggests an extrinsic cause, we recommend not only CT, but also MR imaging of the popliteal fossa.

References

1. Flanigan DP, Burham SJ, Goodreau JJ, Bergan JJ. Summary of cases of adventitial cystic disease of the popliteal artery. *Ann Surg* 1979;189:165-175
2. Wilbur AC, Woelfel GF, Myeyr JP, Flanigan DP, Spigos DG. Adventitial cystic disease of the popliteal artery. *Radiology* 1985;155:63-64
3. Fitzjohn TP, White FE, Loose HW, Proud G. Computed tomography and sonography of cystic adventitial disease. *Br J Radiol* 1986;59:933-5
4. Schlesinger A, Gottesman L. Cystic degeneration of the popliteal artery. *AJR* 1976;127:1043-1045
5. Bunker SR, Lauten GJ, Hutton, Jr SR. Cystic Adventitial Disease of the Popliteal Artery. *AJR* 1981;136:1209-1212
6. Crolla RM, Steyling JF, Hennipman A, Sloodweg P, Taams A. A case of cystic adventitial disease of the popliteal artery demonstrated by magnetic resonance imaging. *J Vasc Surg* 1993;18:1052-5
7. Atkins HJB, Key JA. A case of myxomatous tumor arising in the adventitia of the left external iliac artery. *Br J Surg* 1947;34:426-427
8. Erjup B, Hierton T. Intermittent claudication: three cases treated by free vein graft. *Acta Chir Scand* 1954;108:217-30
9. Pakes A. Intraneural ganglion of the lateral popliteal nerve. *J Bone Joint Surg [Br]* 1961;43:784-790
10. Shute K, Rothie NG. Aetiology of cystic arterial disease. *Br J Surg* 1973;60:397-400

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슬와동맥에 생긴 Cystic Adventitial Disease의 전산화단층촬영과 자기공명영상소견:1예 보고¹

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Cystic adventitial disease는 주로 슬와동맥에서 발생하는 매우 드문 혈관질환이다. 자기공명영상은 슬와동맥의 adventitial cyst와 압박된 혈관내강을 관찰하는데 유용하다.

진단방사선과 전문의시험 출제 경향 안내

1. 전문의 시험 분야별 출제비율

분 야	비 율
호흡기	15
심맥관	6
위장관	9
간, 담도, 췌	9
비뇨생식	11
신경	14
근, 골격	9
소아(전체 분야에서)	10
유방(전체 분야에서)	3
핵의학	7
물리(법규 1%포함)	7
총 계	100

2. 핵의학 분야의 수련은 현행대로 2개월 이상 의무적으로 수련해야 하며 전문의 시험에도 핵의학을 현행 비율대로 계속 출제 할 것임.
3. 동위원소 취급 특수면허 취득을 위한 교육이나 동면허취득으로 상기 2항의 수련 의무를 대신하지 못함.
4. 상기 출제 비율은 당해연도 문제 선택위원의 성향 또는 문제은행의 문제 성향 등에 따라 증감될 수 있음.
5. 전공의의 전문의시험 응시자격을 위한 논문은 응시서류 제출시 별책을 제1저자 원저 1편과 공저자 2편을 제출하여야 함(단, 증례보고와 논문게재 확인 증명서는 안됨).