» Case Report «

A Case of Popliteal Artery Entrapment Syndrome with Chronic Total Occlusion

Yasunori Iida, MD, Ph.D,¹ Yukio Obitsu, MD, Ph.D,¹ Naozumi Saiki, MD,¹ Miki Izumi, MD, Ph.D,²
Hiroyoshi Komai, MD, Ph.D,¹ and Hiroshi Shigematsu, MD, Ph.D¹

Popliteal artery entrapment syndrome (PAES) is rare congenital anomaly that occurs due to compression of the popliteal artery by adjacent musculotendinous structures. We report a 54-year-old woman with PAES of total popliteal arterial occlusion was successfully treated by release of the muscle bundle and reconstruction of the popliteal artery. Pathologic examination revealed that the extracted portion of the popliteal artery had chronic total occlusion with fibrosis and destruction of internal elastic membrane. We should deliberate whether we reconstruct the popliteal artery in addition to release of the aberrant muscle bundle due to the preoperative examination to prevent the reoperation.

Key words: popliteal artery entrapment syndrome, chronic total occlusion, CT angiography

INTRODUCTION

Popliteal artery entrapment syndrome (PAES) is a rare congenital anomaly that occurs due to compression of the popliteal artery by adjacent musculotendinous structures, which was first described by Stuart.¹⁾ The diagnosis is usually made by computed tomography (CT) or magnetic resonance imaging (MRI), and, in particular, computed tomographic angiography (CTA) can express the precise anatomical relations of muscle, bone and artery as well as the degree of stenosis or occlusion of the popliteal artery. CTA is helpful when we bypass the popliteal artery in addition to releasing the aberrant muscle bundle.

¹Department of Vascular Surgery, and ²Department of Medical Education, Tokyo Medical University, Tokyo, Japan

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Address for reprint requests to Yasunori Iida, MD, Ph.D: Department of Vascular Surgery, Tokyo Medical University, 6-7-1 Nishishinjuku, Shinjuku-ku, Tokyo 160-0023, Japan
Tel: +81-3-3342-6111 (Ext 5077), Fax: +81-3-3342-6193
E-mail: y.iida@vanilla.ocn.ne.jp

CASE REPORT

A 54-year-old woman presented complaining of severe pain in the right calf when mountaineering and she gradually felt deterioration of the right lower limb fatigue on exertion. Systemic examinations, which included blood pressure and other laboratory investigations such as atherosclerotic risk factors were unremarkable. The preoperative right ankle brachial pressure index (ABPI) dropped from 0.9 to “immeasurable” on ankle flexion. CTA demonstrated segmental occlusion of the right popliteal artery and genicular collateral developments (**Fig. 1**). We also confirmed right popliteal artery extrinsically compressed by gastrocnemius muscle in the horizontal image of CT. Diagnosis of PAES was made and surgical release of the aberrant gastrocnemius muscle bundle and popliteal arterial reconstruction using the great saphenous vein were performed because we recognized complete occlusion of the right popliteal artery on CTA. Pathologic examination revealed that the extracted portion of the popliteal artery had chronic total occlusion with fibrosis and destruction of the internal elastic membrane (**Fig. 2, asterisk**). The postoperative ABPI rose from “immeasurable” to 1.28 even on ankle flexion. There were no abnormal findings in the postoperative CTA, the patient was discharged and she is now able to

Fig. 1 Preoperative CTA demonstrates segmental occlusion of the right popliteal artery and genicular collateral developments.

Fig. 2 The extracted portion of the popliteal artery has chronic total occlusion with fibrosis and destruction of the internal elastic membrane (*asterisk*).

continue mountaineering without any claudication.

DISCUSSION

PAES is an uncommon cause of intermittent claudication in young adults. Suspected cases of PAES have to undergo bilateral extremity examination because of the high frequency of contralateral popliteal artery disease. According to the most commonly accepted 6-type classification discussed by Rich et al.²⁾, the present case was classified as type II from the horizontal image of CT, in which an anomalous slip of muscle originates from the midline of the posterior cortex of the distal femur and compresses the popliteal artery. Recently, a new variant of PAES, in which an anomalous slip of muscle from the gastrocnemius muscle causes compression of the popliteal artery was reported by Rochier et al.³⁾

As patients with PAES are exposed to acute thrombotic occlusion of the popliteal artery, surgical treatment to release the compressing aberrant muscle is the standard treatment in cases of compressive pathology, while in complicated pathology with arterial stenosis or chronic occlusion, vascular reconstruction is added as in the present case.

CTA examination was helpful when we reconstructed

the popliteal artery in addition to releasing of the aberrant muscle bundle. In the present case, we pathologically confirmed that the removed portion of the popliteal artery was severely occluded, accompanied by fibrosis and destruction of the internal elastic membrane without any findings of aneurysm or thrombus. Therefore, we considered that occlusion of the popliteal artery was brought by repetitive mechanical stimulation of aberrant muscle bundle. There is only one case in which not only the successful surgical reconstruction but the similar pathological finding also been reported on the paper.⁴⁾ In that case, the pathological finding showed acute occlusion of popliteal artery by thrombotic material. However, in the present case, the popliteal artery was occluded chronically with distal reconstruction via collateral artery judging from the clinical symptom and the finding of the CTA and pathological findings. We should deliberate whether we reconstruct the popliteal artery in addition to release of the aberrant muscle bundle due to the preoperative examination to circumvent the reoperation.

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