● Case Report ●

Stent Placement to Treat Buttock Claudication Caused by Internal Iliac Artery Dissection

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Abstract: A case of buttock claudication due to internal iliac artery (IIA) dissection is presented. Although the peripheral arterial pulsations were palpable and the ankle/brachial index was 1.00, angiography demonstrated dissection with severe stenosis of the right IIA. Orthopedic and neurological examinations revealed no abnormal findings. The patient was successfully treated with stent placement for the right IIA dissection. The pelvic arteries hardly cause ischemia because of collateral vessels concentration. Therefore, the fact that the differential diagnosis of buttock claudication is reportedly difficult strongly suggests physicians should carefully follow up such patients. (J Jpn Coll Angiol, 2004, **44**: 805–808)

Key words: internal iliac artery dissection, buttock claudication, stent placement

Introduction

The differential diagnosis of buttock claudication is reportedly difficult.[1] Claudication of the thigh or hip is usually a reliable indicator of atherosclerotic disease of the distal abdominal aorta and iliac arteries. However, buttock claudication may signify either neurologic, orthopedic, or vascular causes. The internal iliac artery (IIA) region is rich in collateral arteries. Therefore, symptoms restricted to the gluteal muscles resulting from stenosis of only the IIA are extremely rare.[2] In this report, we present a rare case of buttock claudication caused by acute dissection in the IIA, whose symptoms resolved stent placement.

Case

A 59-year-old male presented with incapacitating, severe, right-sided buttock claudication of sudden onset. His pain-free walking distance was 30 m, and the maximal walking distance 200 m. He had been symptomatic for four months. About one year previously, he had undergone an angioplasty, followed by successful balloon dilatation, and stent placement, for treatment of right common iliac artery stenosis. His physical examination revealed normal pulsations of both the right femoral and dorsalis pedis arteries. The ankle/brachial pressure index (ABPI) was normal: 1.00 in the right leg, and 0.97 in the left leg, at rest. Orthopedic and neurological examinations revealed no abnormal findings. He had no problems with impotence nor others relating to sex. Angiography demonstrated patency of the right common iliac artery, and severe stenosis at the origin of the right IIA, due to dissection. The right obturator artery was detected, while the collateral arterial pathways were generally insufficient (**Fig. 1**). The pressure gradient between the proximal and distal sides of the dissection was about 100 mmHg.

Under local anesthesia, after systemic heparinization, a 7F-90 cm guiding sheath (Shuttle®, Cook Inc., IN, U.S.A.) was introduced to the right IIA from the left brachial artery. We inferred a pin-point stent placement would work better for this short dissection IIA orifice, because steep kinking was found nearby on the peripheral side of the dissection, as shown in **Fig. 1A**. The balloon angioplasty (Powerflex® in 5

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mm in diameter and 20 mm in length. Cordis Co. a Johnson & Johnson Co., Miami lakes, FL, U.S.A.) and metallic stent placement (Palmatz® 2002E in 5 mm diameter and 19.2 mm length, Johnson & Johnson Interventional Systems Co., Warren, NJ, U.S.A.) for the right IIA dissection were performed (**Fig. 2)**. Post-angioplasty angiography and intravascular ultrasound examination showed considerable reduction of the stenosis (**Fig. 3**). The pressure gradient had dropped to 12 mmHg. Relief of the buttock claudication was noted on the first post-angioplasty day, to ensure the patient's safety, careful follow-up continued for one year. The ankle brachial pressure index was 1.00 after one year, which corresponded to the pre-angioplasty value.

Discussion

Aortic end and iliac arteries are prone to develop atherosclerotic lesions.[3] The detection of a contra-lateral iliac artery lesion in this patient indicated that this dissection was caused by atherosclerosis. However, buttock claudication

Figure 1 Pre-angioplastic angiography. Dissection at the ostium of the right internal iliac artery was found. The collateral arteries developed poorly.

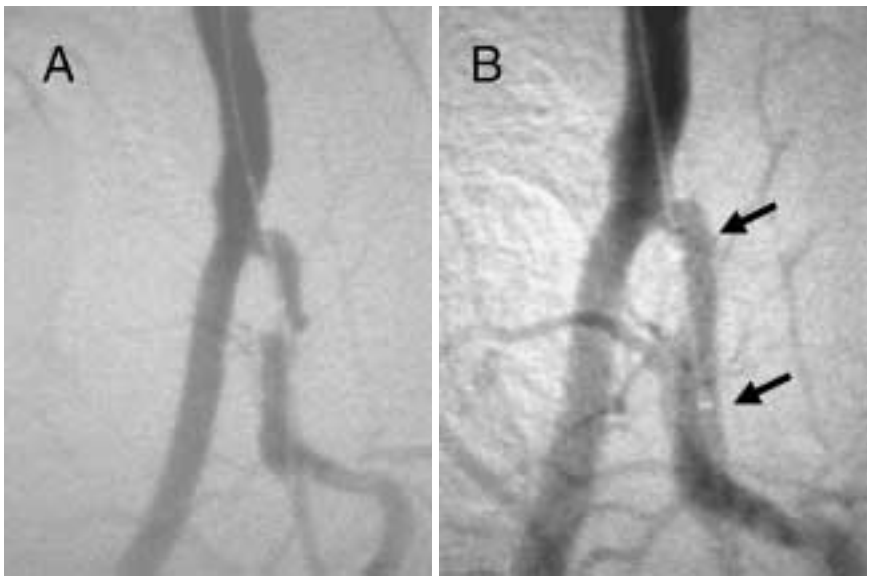

Figure 2 Intraoperative fluoroscopic findings.
A: Pre-stenting.
B: Post-stentig findings. Palmatz® stent 5 mm in diameter and 19.2 mm in length was placed.
Arrows show the position of the stent.

caused by IIA dissection is reportedly rare. Under normal circumstances, the potentially well-developed network of arterial collaterals in the hip region will maintain the blood supply.[2] Only if this network is compromised due to occlusive disease, ischemic buttock pain will occur. The most important collaterals in the area include the anastomosis between the inferior mesenteric and IIAs via the rectal arterial network.[4] Because of the extensive collateral circulation, even IIA ligation is a potentially life-saving procedure that can be carried out during uncontrollable pelvic hemorrhage.[5]

Therefore, it may be difficult to differentially diagnose patients presenting with buttock claudication. Penile pressure measurement is a simple and non-invasive method in assessing pelvic circulation.[6] Recently, as other means of assessing muscle ischemia, Thallium or Tc-99mMIBI scintigraphy and near infrared spectroscopy (NIRO) have been developed.[7, 8] In particular, NIRO is reported to precisely reflect muscle ischemia. Our patient had neither impotence nor sexual dysfunction. The findings from other orthopedic and neurological examinations (e.g. for spinal stenosis, in which relief of pain is achieved by a change of position; arthritis, or degenerative hip disease) were negative. Because his symptom was typical gluteal muscle claudication, we performed only angiography examination. As expected, proximal stenosis of the common iliac or external iliac artery was ruled out by this examination. Angiography is essential to reach a correct diagnosis, in addition to non-invasive examinations. The angiography showed dissection of the right IIA, but it was difficult to conclude if the dissection was responsible for the buttock claudication. However, the intra-angioplastic pressure measurement showed a gradient of 100 mmHg between the proximal and distal sides of the dissection, confirming that his symptoms were caused by ischemia.

For buttock claudication, conservative therapy is the treatment of choice in hope of the development of collateral circulation. Kudo et al. reported sufficient revascularization after one year in IIA ligation cases.[9] However, our patient had relatively severe atherosclerotic changes in the bilateral iliac arteries. He complained of physical disabilities in his daily life, strongly suggesting we launch an active form of treatment. Transluminal angioplasty for IIA has previously been reported only a few times.[1, 6, 10-13] The IIA is rich in collateral arteries, and needs no positive revascularization for stenosis. Furthermore, the fact that the IIA is down deep and relatively small makes it difficult to perform surgery on this artery. We surmised that transluminal angioplasty would be a single appropriate procedure. In our present case, accurate and safe angioplasty was performed through the left brachial artery.

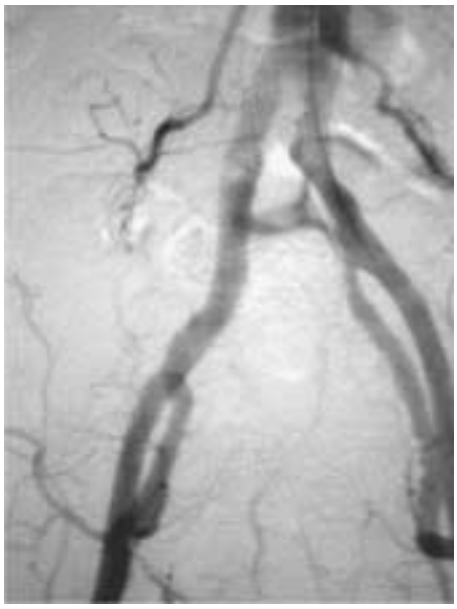

Figure 3 Post-angioplastic angiography. The stenosis was reduced considerably.

After angioplasty, the patient's symptoms were relieved during hospitalization, and his ABI was normal at the 1-year follow-up. Follow-up of such cases is as important as the procedure itself, because buttock claudication may be caused by an alteration in the patient's natural gait pattern, myalgia in responsible muscle groups, and so on.

References

1) Kofoed SC, Bismuth J, Just S et al: Angioplasty for the treatment of buttock claudication caused by internal iliac artery stenoses. Ann Vasc Surg, 2001, **15**: 396–398.
2) Iliopoulos JI, Howanitz PE, Pierce GE et al: The critical

hypogastric circulation. Am J Surg, 1987, **154**: 671–675.
3) Johnson KW, Kalman PG: Aortoiliofemoral occlusive diease. In: Hobson RW, Wilson SE, Veith FJ, eds. Vascular Surgery 3rd. Dekker Marcel, New York, 2004, 439–454.
4) Lose G, Jørgensen L, Lorentzen JE: Regional ischemia due to compromised collateral circulation after arterial reconstruction. Acta Chir Scand, 1985, **151**: 301–303.
5) Fehrman H: Surgical management of life-threatening obstetric and gynecologic hemorrhage. Acta Obstet Gynecol Scand, 1988, **67**: 125–128.
6) DePalma RG, Olding M, Yu GW et al: Vascular interventions for impotence: Lessons learned. J Vasc Surg, 1995, **21**: 576–584.
7) Matsukura I, Inoue H, Sugano N et al: The mechanisms and assessments of the buttock claudication onset (in Japanese). Jpn J Vasc Surg, 1999, **8**: 236.
8) Sato K, Kinjo M, Nishimaki H et al: Near infrared spectroscopy for objective assessment of the society of intermittent claudication. Jpn J Vasc Surg, 1998, **7**: 813–820.
9) Kudo T, Inoue Y, Iwasaki T et al: Buttok claudication after abdominal aortic aneurysmectomy. Jpn J Vasc Surg, 2001, **10**: 485–490.
10) Hodgson KJ, Sumner DS: Buttock claudication from isolated bilateral internal iliac arterial stenoses. J Vasc Surg, 1988, **7**: 446–448.
11) Morse SS, Cambria R, Strauss EB et al: Transluminal angioplasty of the hypogastric artery for treatment of buttock claudication. Cardiovasc Intervent Radiol, 1986, **9**: 136–138.
12) Smith G, Train J, Mitty H et al: Hip pain caused by buttock claudication. Relief of symptoms by transluminal angioplasty. Clin Orthop, 1992, **284**: 176–180.
13) Cook AM, Dyet JF: Percutaneous angioplasty of the superior gluteal artery in the treatment of buttock claudication. Clin Radiol, 1990, **41**: 63–65.