

Pseudoaneurysm of external iliac artery after extracorporeal shock wave lithotripsy revealing Behçet disease

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ABSTRACT

Extracorporeal shock wave lithotripsy (ESWL) can lead to rare but severe arterial complications. The causal relationship of ESWL with arterial pseudoaneurysm formation in a patient with Behçet disease is discussed. A 35-year-old man presented with acute recrudescence of right flank pain caused by ureteral lithiasis immediately after having undergone a last session of ESWL. Abdominal examination revealed a painful pulsatile mass in the right iliac region. Contrast-enhanced computed tomography identified a pseudoaneurysm of the right external iliac artery in a patient with a medical history of Behçet disease. The pseudoaneurysm was treated endovascularly, including the use of a covered stent with intensive immunosuppressive therapy. We obtained successful exclusion of the pseudoaneurysm. This case highlights that arterial pseudoaneurysm may occur after ESWL in patients with Behçet disease. Strict follow-up after ESWL sessions is necessary. (*J Vasc Surg Cases and Innovative Techniques* 2020;6:473-7.)

Keywords: Lithotripsy; Pseudoaneurysm; Behçet disease

Extracorporeal shock wave lithotripsy (ESWL) has been widely used to treat upper urinary tract calculi, although severe complications may be encountered.¹ We report the case of a 35-year-old man who presented with a pseudoaneurysm of the external iliac artery revealing Behçet disease 1 month after the last ESWL session for treatment of ureteral calculi. The causal relationship of ESWL with arterial pseudoaneurysm formation in a patient with Behçet disease is discussed. The patient agreed to publication of the case details and images.

CASE REPORT

A 35-year-old man presented with acute recrudescence of right flank pain. Symptoms arose 2 years ago with repeated attacks of right renal colic caused by ureteral lithiasis. In his medical history, the patient had hypertension, recurrent mouth and genital ulcerations, intermittent joint swelling, and pain of the knees. ESWL was initiated 5 months ago. The patient had undergone four sessions of ESWL within 4 months to treat

two right proximal and distal ureteral stones <2 cm at another institution. A total of 5000 shock waves were given with partial fragmentation. Immediately after the last ESWL session performed 1 month before presentation, the patient started having acute right flank pain radiating to the inguinal region, associated with difficulty in walking. Analgesic medications were administered without resolution of the symptoms. Physical examination found an afebrile patient who was hemodynamically stable. The rest of the cardiorespiratory examination findings were unremarkable. Abdominal examination revealed a painful pulsatile mass in the right iliac region. No audible aneurysmal bruit was found. The other vascular axes were without particularity. Laboratory data included a hematocrit of 33.8% and a white blood cell count of 11,000/mm³. The C-reactive protein level was 86.7 mg/L, and procalcitonin was negative. Urine and blood cultures were negative for aerobic and anaerobic organisms.

Electrocardiography was unremarkable. Abdominal Doppler ultrasound disclosed a vascular mass within the right iliac artery. Contrast-enhanced computed tomography (CT) confirmed a 32.3 × 24.1-mm, well-defined, septated mass (Fig 1) within the right external iliac artery, indicating a pseudoaneurysm (Fig 2), and eliminated other aneurysmal locations, especially in the aorta and lower limbs.

The diagnosis of arterial pseudoaneurysm after ESWL in a patient with vasculo-Behçet disease was retained. To exclude other complications related to Behçet disease, cardiac ultrasound was performed; findings were normal. The ophthalmic examination revealed no ocular damage.

To exclude this pseudoaneurysm, we planned the implantation of a covered stent in the right external iliac artery. Before the endovascular procedure, the patient received immunosuppressive therapy. The regimen suggested in vasculo-Behçet disease consists of three boluses of intravenous methylprednisolone (1 g/d) and cyclophosphamide (200 mg/d) for 3 days.

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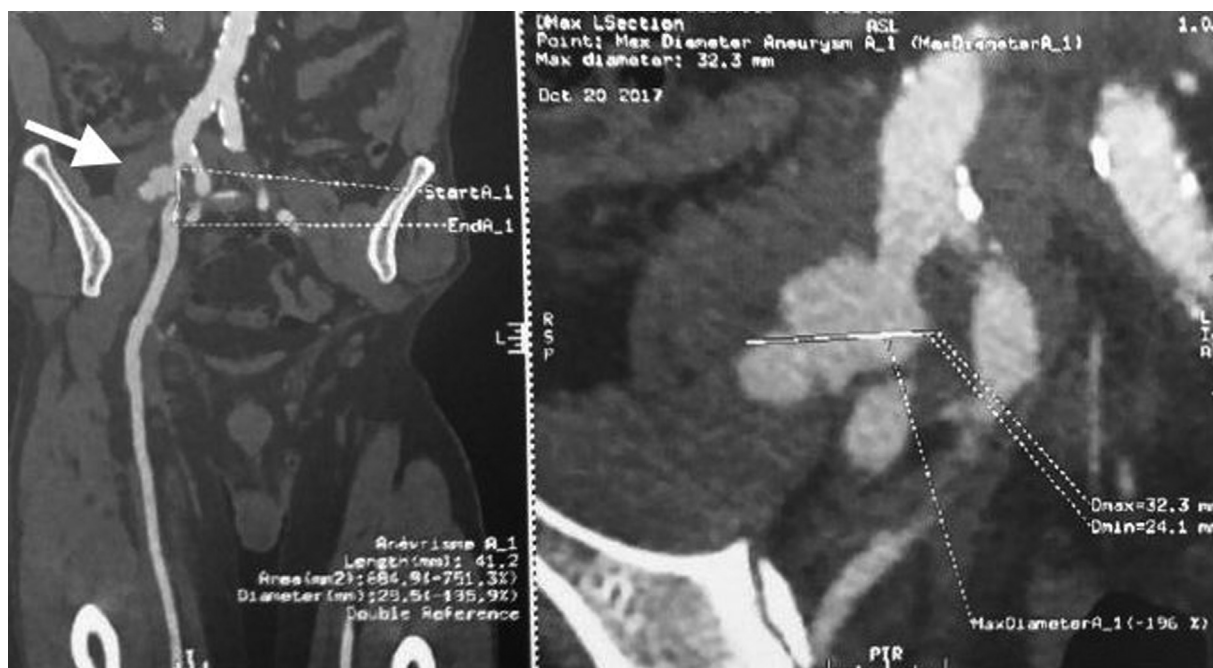


Fig 1. Frontal images of preoperative contrast-enhanced computed tomography (CT) showing a 32.3- × 24.1-mm septated mass within the right external iliac artery, indicating a pseudoaneurysm (arrow).

A Zenith Alpha (Cook Medical, Bloomington, Ind) iliac leg ZISL 13-42 mm covered and tubular stent graft was implanted when the inflammatory markers had decreased (particularly C-reactive protein level decrease from 86.7 mg/L to 25 mg/L) without obtaining normal values because of the urgent setting. We obtained successful exclusion of the pseudoaneurysm (Fig 3).

The postoperative immunosuppressive drug doses were adjusted by a rheumatologist on the basis of the patient's symptoms and the erythrocyte sedimentation rate. Two years after surgery, the patient remains asymptomatic with no abdominal pain and a normal right femoral pulse. Abdominal Doppler ultrasound evaluation demonstrated no pseudoaneurysm recurrence within the right iliac artery.

DISCUSSION

ESWL is the treatment of choice for the majority of patients with renal and upper ureteral calculi because it is effective and noninvasive. However, a number of complications have been reported.² Renal artery pseudoaneurysm rupture has occurred as a consequence of ESWL.³ Complications arising within the arterial tree but outside the aorta are rare and are limited to several single case reports.¹

In our case, data showing the causal relationship of ESWL with arterial wall disease were relatively clear: the onset of abdominal and right inguinal pain immediately after the last ESWL session; the CT imaging, which identified a pseudoaneurysm in the same region occupied by previous ureteral calculi; the location of the patient's treated calculus within the parallel axis of shock waves not far from the region of the pseudoaneurysm (Fig 2);

and the patient's history of hypertension, with some calcifications on CT, which could represent a pseudoaneurysm from rupture of a calcified plaque. However, the patient was 35 years old, and we believe that the inflammatory hypothesis is most probable.

These data indicate that the chronologic origin of the pseudoaneurysm was related to repetitive ESWL sessions in a patient with Behçet disease. Shock waves may have harmful effects on organs adjacent to the targeted ureteral stones, as reported in some articles.⁴ Repeated ESWL sessions have also been shown to cause cumulative damage on vessels wall.² In our case, a total of 5000 shock waves were given with partial fragmentation. It was the maximum threshold dose and probably an excessive amount of shock waves for a patient with vascular disease.

Aneurysms in Behçet disease usually involve medium and large arteries, such as the aorta and femoral, pulmonary, iliac, and popliteal arteries.^{5,6} The etiology of Behçet disease remains unknown, and the pathologic basis is peripheral inflammation. Abnormal neutrophil activity is considered to be the main pathogenesis of Behçet disease.⁷ Endarteritis obliterans is induced by occlusions of the vasa vasorum of large and middle arteries.⁷ These vessel wall changes lead to formation of true aneurysms by wall distention or pseudoaneurysm by wall perforation.⁸

Previously, open surgical repair was the definitive treatment for vascular lesions such as aneurysm in Behçet disease patients.⁹ However, some studies have reported its recurrence after surgical management in approximately

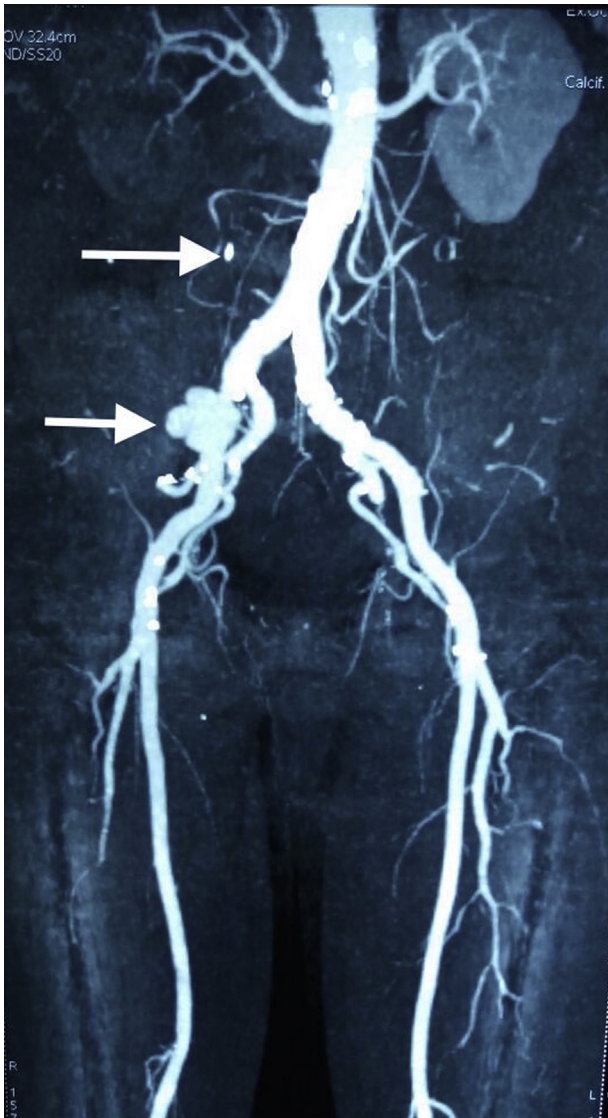


Fig 2. Three-dimensional computed tomography (CT) angiography showing ureteral lithiasis (*arrow*) close to pseudoaneurysm of the right external iliac artery.

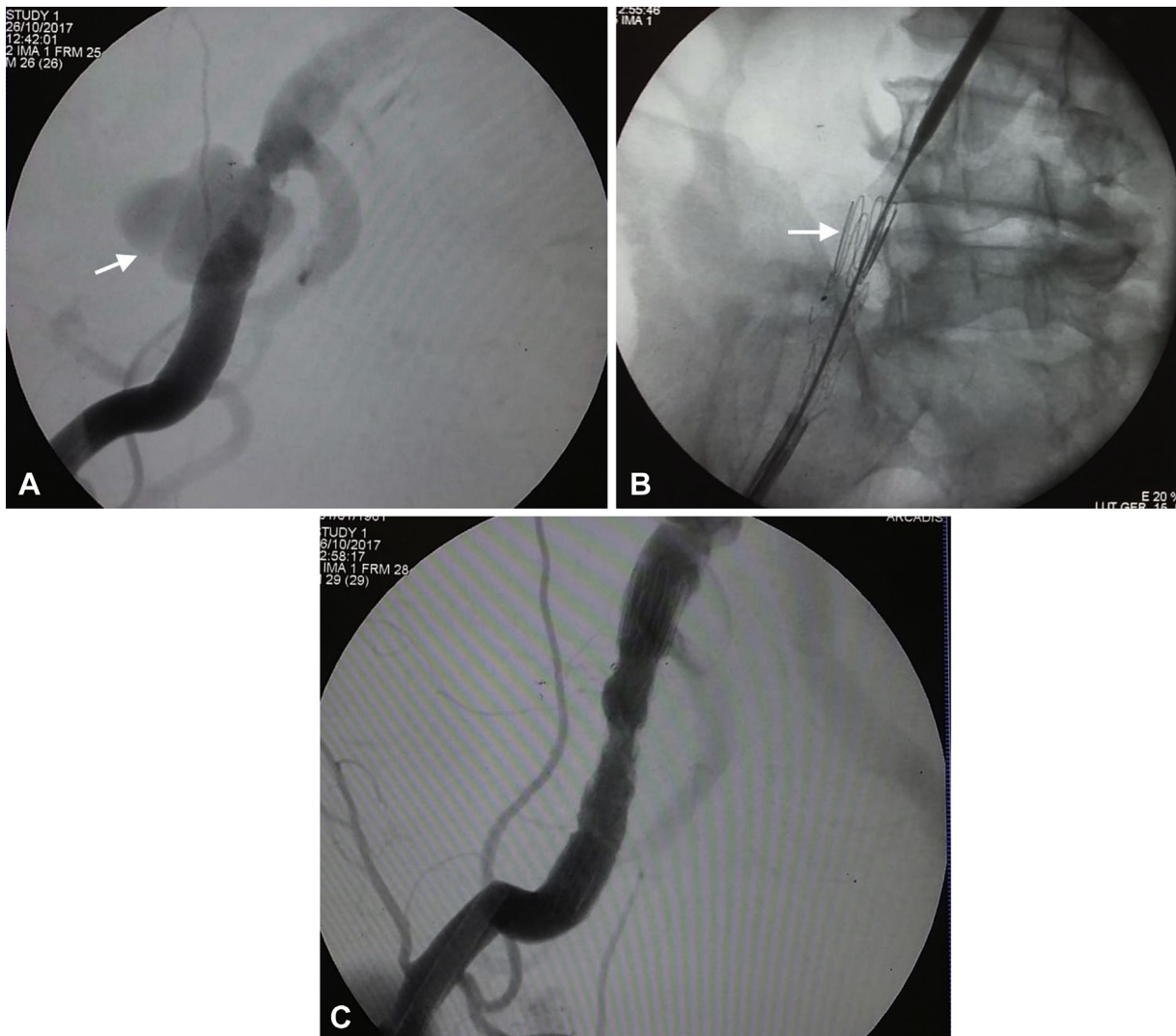


Fig 3. **A**, Catheter-directed angiogram demonstrating a preprocedural pseudoaneurysm of the right external iliac artery. **B**, Deployment of an endovascular stent graft. **C**, Exclusion of the external iliac artery pseudoaneurysm with an endovascular stent graft.

half of the cases.¹⁰ To avoid the recurrence of aneurysms and mortality stemming from surgical repair, the endovascular insertion of a stent graft with additional immunosuppressive therapy may be a reasonable alternative and is suggested in treatment of peripheral aneurysms in Behçet disease.⁹⁻¹¹ In this case, endovascular repair of the iliac pseudoaneurysm was preferred, combined with immunosuppressive therapy with the intention of reducing the severity of vascular inflammation and decreasing the aneurysm recurrence.

CONCLUSIONS

This report highlights that arterial pseudoaneurysm may occur after ESWL in patients with Behçet disease. In these patients, ESWL should be performed under the supervision of a vascular surgeon and with careful perioperative observation and immediate post-ESWL

Doppler ultrasound after each session. Final contrast-enhanced CT control is necessary.

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