» Case Report «

Spontaneous Rupture of Superficial Femoral Artery

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A 77-year-old man with a history of hemodialysis was referred due to swelling of the right groin. Enhanced computed tomography (CT) showed extravasation of the medium from the superficial femoral artery (SFA) with surrounding large hematoma. Three-dimensional CT angiography revealed rupture of SFA just distal to common femoral artery with pseudoaneurysmal formation. At an emergent surgery, SFA was ruptured over 1/2 circumferentially in a 2-cm length. Patch repair using great saphenous vein was performed successfully. Postoperative CT angiography showed no aneurysmal formation. Histopathological findings of operative specimen disclosed no sign of infection or arteriolitis.

Keywords: spontaneous rupture, superficial femoral artery

INTRODUCTION

Spontaneous rupture of superficial femoral artery (SFA) is an extremely rare entity. Only a few reports have been published in the literature.¹⁾ Various treatments from conservative to surgical ones have been proposed, and with advancement of endovascular repairs, their utility has been reported.

We describe a case of spontaneous rupture of SFA treated by surgical corrections, and discuss the optimal treatments based on the patients' conditions.

CASE

A 77-year-old man with a history of hypertension and hemodialysis was referred due to swelling of the right groin. The finding had been recognized for more than one month. There was no history of trauma or arterial

puncture for hemodialysis. His consciousness was alert, and remained stable hemodynamically. Physical examination revealed the pulsatile swelling of the right groin with skin necrosis and reddish (**Fig. 1**). Laboratory examination showed a hemoglobin value of 9.4 g/dL, white blood cell count of 13800 with 76.5% segmented neutrophils, C-reactive peptide value of 21.84 mg/dL. Serologic tests for syphilis were positive. Because white blood cell count and C-reactive peptide elevated, blood cultures were taken on suspicion of infection.

Enhanced computed tomography (CT) showed extravasation of the medium from the SFA with surrounding large hematoma (**Fig. 2**). CT angiography revealed the severe calcification of the femoral arteries and rupture of SFA just distal to common femoral artery with pseudoaneurysmal formation (**Fig. 3**). We considered that rupture of SFA occurred possibly as a result of infection. An emergent surgical repair was performed because of suspicion of infection. Under general anesthesia, skin incision was added and massive hematoma was recognized subcutaneously. After systemic heparinization, common femoral artery, deep femoral artery and SFA were clamped, subsequently massive hematoma was removed. At surgery, SFA was ruptured over 1/2 circumferentially in a 2-cm length. Some parts of the calcified wall were recognized at the site of rupture. Patch repair using great saphenous vein was performed successfully. Infectious

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Fig. 1 Clinical picture shows the pulsatile swelling of the right groin with skin necrosis and reddish.

Fig. 2 Enhanced computed tomography (CT) shows extravasation of the medium from the superficial femoral artery (SFA) with surrounding large hematoma.

signs were not recognized intraoperatively. Postoperative CT angiography showed no aneurysmal formation. Histopathological findings of operative specimen disclosed no sign of infection or arteriolitis. Blood culture was negative. Based on these findings, a diagnosis of spontaneous rupture of SFA, which was possibly caused by severe calcification, was made.

DISCUSSION

Spontaneous rupture of SFA is an extremely rare entity. To our knowledge, only a few case reports have been published in the literature.¹⁾

The causative mechanisms of spontaneous rupture of SFA are unknown. Some authors described that in young

Fig. 3 Three-dimensional computed tomographic angiography reveals the severe calcification of all the femoral arteries and rupture of superficial femoral artery (SFA) just distal to common femoral artery with pseudoaneurysmal formation.

patients, inherited connective tissue disorders such as Ehlers-Danlos or congenital arterial abnormalities can be the cause leading to spontaneous rupture of SFA because of the fragility of the arterial wall.²⁾ Meanwhile, in the elderly, atherosclerosis has been considered an etiologic factor. In those cases, atherosclerotic changes and weakness of arterial wall could lead to spontaneous rupture.^{2,3)} In our patient, preoperative CT revealed the diffuse and severe calcification of femoral artery, but no dilatation of femoral arteries. Additionally, he had a history of hemodialysis and hypertension. We thought that these factors aggressively affected atherosclerotic changes of arterial wall, leading to the spontaneous rupture of SFA and consequent development of surrounding hematoma. Syphilis-related vasculitis or aneurysm has been well-known, but recently they have become rare, thanks to antibiotics. To deny this rare entity, histopathological test was performed and we confirmed that operative specimen disclosed no sign of vasculitis. Based on these findings totally, we came to the conclusion that the rupture in our case occurred spontaneously.

With regard to treatments, in cases of insubstantial bleeding without vein or nerve compression, conservative treatment may be proposed.⁴⁾ Conversely, with the compression of vein or nerve, aggressive measures are required. Particularly, in young patients, surgical exploration with removal of hematoma and arterial repair including direct suture repair, vein patch repair or graft interposition are recommended.¹⁾

A huge hematoma could make the surgical corrections

complicated with risk of infection.⁵⁾ With increasing technology of endovascular treatment, in patients with a huge hematoma, endovascular stent grafting alternative to surgical corrections is considered suitable and feasible.⁵⁾ However, we must pay attention to stent graft or arterial graft infection, which is a devastating condition with a mortality rate ranging from 25% to 88%.²⁾ We previously have reported that in ruptured infected aortic aneurysm, temporary deployment of stent graft was applied as a bridge to delayed open surgery to stabilize the hemodynamics in acute phase.⁶⁾ This concept may be acceptable in hemodynamically unstable conditions.

In present case, at first we suspected the infection, which subsequently led to the arterial rupture in hemodynamically stable condition. In the presence of infection, we wanted to avoid the stent graft placement. This patient had skin necrosis in the right thigh. A huge hematoma compressed the skin, and resulted in the necrosis. As Siani and coworkers proposed as mentioned above,¹⁾ we removed the hematoma to alleviate the compression of the skin.

CONCLUSION

Spontaneous rupture of SFA is a very rare entity, and we, cardiovascular surgeons will rarely encounter this disease in the future. Despite its rarity, we have various choices of treatments. However, we must keep in mind that surgical corrections are still considered as the gold

standard. According to the patients' condition, the optimal treatments are selected.

DISCLOSURE STATEMENT

Authors declared no conflicts of interest.

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