Peripheral arterial aneurysms are mostly seen in popliteal and femoral arteries, respectively. These aneurysms are relatively rare but can be hazardous if they remain untreated.1,2 Atherosclerosis is the leading cause in the development of aneurysms, but popliteal artery’s locational characteristics, genetic predisposition and immunological causes are the other etiologic factors, yet mostly being hypothetical.3 Doppler ultrasonography, computerized tomography (CT), magnetic resonance (MR) angiography (MRA) and digital subtraction angiography (DSA) are the diagnostic modalities for the diagnosis and follow-up of these aneurysms.3 It is advised to treat patients who have popliteal aneurysms greater than 2 cm, and

Which do You Prefer in Popliteal Artery Aneurysm: Endovascular Treatment or Surgery?: Case Report

Popliteal Artery Aneurizmalarının Tedavisinde Hangisi Tercih Edilmelidir?
Cerrahi mi, Endovasküler Yöntemler mi?

ABSTRACT Popliteal artery aneurysm is an important limb- and life-threatening disease. Both conventional surgery and endovascular interventions are found to be curative, and must be performed when appropriate. A 63-year-old male patient with a hematoma in his right thigh was referred to our hospital. He had a previous endovascular intervention in our hospital for his right popliteal aneurysm two years previously. Doppler ultrasonography showed a 23x11 cm sized hematoma and endograft stents were out of the arterial lumen. Organized and infected-looking material was removed under general anesthesia. Popliteal artery aneurysm may progress and is associated with increased morbidity and mortality. Surgical repair, and in recent years, endovascular interventions are alternatives in the treatment. We think that endograft intervention is a good option for patients who are not good candidates for surgery.

Key Words: Popliteal artery; endovascular procedures; aneurysm


Anahtar Kelimeler: Popliteal arter; endovasküler prosedürler; anevrizma

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peripheral arterial aneurysms are mostly seen in popliteal and femoral arteries, respectively. These aneurysms are relatively rare but can be hazardous if they remain untreated.1,2 Atherosclerosis is the leading cause in the development of aneurysms, but popliteal artery’s locational characteristics, genetic predisposition and immunological causes are the other etiologic factors, yet mostly being hypothetical.3 Doppler ultrasonography, computerized tomography (CT), magnetic resonance (MR) angiography (MRA) and digital subtraction angiography (DSA) are the diagnostic modalities for the diagnosis and follow-up of these aneurysms.3 It is advised to treat patients who have popliteal aneurysms greater than 2 cm, and
femoral artery aneurysms greater than 3 cm, even though they are asymptomatic. Treatment of choice was surgery in the past, but especially in last decade, endovascular treatment of lower extremity aneurysms became an alternative to surgery in selected patients. It was shown that treatment of lower extremity aneurysms can be safely achieved by using endovascular therapy. Although long term results are not yet clear, we have information about early mid-term results of endovascular therapy. Limb salvage and patency rates are satisfying, but some unexpected complications can ruin this uneventful course.

CASE REPORT

A 63-year-old hemiplegic male patient with a swelling in his right thigh was referred to our hospital. At his first referral two years ago, popliteal artery aneurysm was diagnosed, and he was not considered as a good candidate for open surgery due to his co-morbidities. Endovascular intervention was performed, and four pieces of the Viabahn stent grafts composed of reinforced polytetrafluoroethylene (PTFE) attached to an external nitinol stent structure were implanted to his aneurysmal segment.

At his second referral with swelling, Doppler ultrasonography confirmed the hematoma which was measured 23 cm in length and 11 cm in width, and the endograft stents were out of the arterial lumen. Doppler ultrasonography could not reveal any distal blood flow, but the patient did not have any ischemic complaints or findings. He only had serious pain over his right thigh. Risk factors were hypertension and left sided hemiplegia. He also had an abdominal aorta aneurysm with a 65 mm maximum diameter, and an intracranial basilar artery aneurysm. We decided to perform a CT-angiography of the lower extremities. Graft fragments were seen in CT-angiography (Figure 1).

Prior to the operation, we planned to perform a femoro-distal bypass after draining the hematoma. At the operation, femoral incision was made and common, superficial and deep femoral arteries were found. Superficial femoral artery was totally calcified except its proximal 1 cm segment. Then, we made an incision over the hematoma, approximately 20 cm in length. Organized and infected-looking material was removed (Figure 2). It was noted that four endograft stents were out of the arterial lumen, and freely floating in hematoma. After bleeding was partially controlled, exploration did not show an intact and graftable popliteal artery for anastomosis. However, the leg was still adequately perfused via collaterals in spite of the absence of a by-pass procedure, so nothing further was done. The patient was followed up in the intensive care unit after the operation, and administered heparin infusion. He gave a good response to inotropes and transfusions, and his blood pressure normalized. He was discharged on the third day after the operation with a warm right foot without any ischemic findings. He did not have any other morbidities associated with the surgery.
DISCUSSION

Popliteal artery aneurysm is an important cause of limb-threatening ischemia. Once an acute ischemia develops due to a thrombosed popliteal artery aneurysm, the amputation rate can be very high. On the contrary, popliteal aneurysms are mostly asymptomatic and diagnosed incidentally. After diagnosis of a popliteal aneurysm, it is important to know the right time for intervention. Popliteal aneurysm expansion rates are directly proportional with the aneurysm size, therefore, a good surveillance can be helpful to determine the intervention time. Surgery is still the gold standard procedure with very satisfactory graft patency rates in the treatment of femoropopliteal aneurysms. In high risk patients, it is suggested to use endografts for aneurysm repair. The graft patency rates are not significantly different for open and endovascular interventions. On the other hand, both procedures are open to some complications like graft occlusions, thrombosis, stent fractures, endoleaks, increase in aneurysm size and ruptures. We used Viabahn stent grafts for our patient. Viabahn stents have good primary and secondary patency rates, and their long term patency is satisfying.

CONCLUSION

In this case, we suspected aneurysmal expansion and subsequent rupture, as reported similar cases. Collateral flow like retrograde flow through geniculate vessels, mimicking type II endoleak, are blamed for this complication. Gradual expansion in 2 years and sudden increase of hematoma size, a sign of rupture, supports our hypothesis. Excising these aneurysms and performing endoaneurysmorrhaphy may be an appropriate procedure in suitable cases. Flow diverting stents can lead to aneurysm thrombosis, and can be an alternative to this problem. To avoid such mortal and destructive consequences, close observation and follow-up of the aneurysms and their collateral flow is necessary.

Conflict of Interest

Authors declared no conflict of interest or financial support.

REFERENCES