The Isolated True Saccular Aneurysm of the Superficial Femoral Artery Presenting with Blue Toe Syndrome

Blue Toe Sendromu ile Ortaya Çıkan Yüzeyel Femoral Arterin İzole Gerçek Sakküler Anevrizması

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Abstract

Isolated true aneurysm of the superficial femoral artery is a rare condition which can threaten the functions and viability of the lower extremities. Despite most of the cases are asymptomatic, the leading symptom is usually rupture, differently from the other peripheral artery aneurysms. They usually seem bilaterally or with accompanying other aneurysms. Here, we reported an isolated superficial femoral artery aneurysm admitted with "Blue Toe Syndrome". 69 years old male patient admitted to the cardiovascular surgery clinic with bruising in his right 3th and 4th toes. An isolated saccular superficial femoral artery aneurysm of 33 mm with an arising muscular artery form the aneurysm in the Hunter`s Canal was detected with ultrasonography and computed tomography angiography. The patient hospitalized and underwent a successful elective aneurysm excision with graft interposition. Post-operative follow up of the patient was uneventful and he was discharged on the post-operative 5th day.Due to their asymptomatic nature in the early period, superficial femoral artery aneurysms can easily escape from attention unless they do not keep in mind. When they diagnosed, all symptomatic cases and even the asymptomatic ones with a critical enlargement should be operated or treated with endovascular techniques.

Keywords: Femoral Artery, Saccular Aneurysm, Surgery, Vascular Grafting

Öz

Yüzeyel femoral arterin izole gerçek anevrizması alt ekstremitelerin fonksiyonlarını ve canlılığını tehdit edebilen nadir bir durumdur. Olguların çoğu asemptomatik olsa da, önde gelen semptom genellikle diğer periferik arter anevrizmalarından farklı olarak rüptürdür. Yüzeyel femoral arter anevrizmaları genellikle bilateral ya da eşlik eden diğer anevrizmalar ile birlikte görülürler. Burada "Blue Toe Sendromu" ile başvuran izole bir yüzeyel femoral arter anevrizmasını rapor ettik. 69 yaşında erkek hasta sağ ayak 3. ve 4. parmaklarında morarma ile kardiyovasküler cerrahi kliniğine başvurdu. Ultrasonografi ve bilgisayarlı tomografi anjiografi ile Hunter Kanalında 33 mm. çapında kendisinden bir kas arteri ayrılan izole, sakküler yüzeyel femoral arter anevrizması tespit edildi. Hasta yatırıldı ve elektif şartlarda başarılı bir anevrizma eksizyonu ve greft interpozisyonu operasyonu yapıldı. Hastanın postoperatif takibi sorunsuz geçti ve postoperatif 5. günde taburcu edildi. Erken dönemdeki asemptomatik doğaları nedeniyle, yüzeyel femoral arter anevrizmaları akılda tutulmadıkça dikkatten kolayca kaçabilirler. Teşhis edildiklerinde, tüm semptomatik olgular ve hatta kritik genişlikte olan asemptomatik olgular da ameliyat edilmeli veya endovasküler tekniklerle tedavi edilmelidir.

Anahtar Kelimeler: Cerrahi, Femoral Arter, Sakküler Anevrizma, Vasküler Greftleme

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Introduction

The enlargement of a vessel over 50% or 1.5 times the diameter including its all 3 layers is called as "true aneurysm". The true aneurysm of the superficial femoral artery (SFAA) is a rarely encountered condition. Despite no certain incidence is given for SFAA in literature, the given incidence for all true femoral artery aneurysms (FAA) is 5 to 7.39 per 100,000 patients (1). Of these FAA, only 15% to 20% are located on SFA (1). The anatomic location of the SFA in Hunter`s Canal surrounded with muscles, deep in the thigh can explain the low incidence of SFAA. On the other hand, pseudoaneurysms of the femoral artery are seen much more often with an increasing incidence due to the increasing number of percutaneous interventions. Most of the patients, who have FAA, have multiple aneurysms in peripheral arteries, aorta or aortoiliac segment and distal occlusive diseases up to 60%. Also, branching of muscular arteries from SFA may create acute angle bifurcation, that increases hemodynamic turbulence and wall stress, which in turn contribute to the occurrence of the aneurysm (2). SFAA are asymptomatic in large proportion, they never could be able to identified or assessed. Like all other peripheral aneurysms, they can lead to acute or chronic ischemia, embolization resulting in infarction or gangrene of the extremity, rupture and perhaps even death. For the diagnosis, Doppler ultrasonography can be used on the first stage. However, for gaining certain information about the size, configuration, internal structure-presence of thrombosis and relationship with other vessels computed tomography angiography (CTA) is recommended. Beyond the SFAA, aorta and other peripheral arteries should be evaluated for an accompanying aneurysm or peripheral arterial disease with the CTA. Magnetic resonance imaging (MRI) and conventional angiogram (CA) can be also used for diagnosis (9). CA can give physician the opportunity of endovascular treatment in the same session but it is unable to differentiate the arterial occlusion and thrombosed aneurysm. Opposite to the other FAA or popliteal artery aneurysms (PAA) which have higher embolism or thrombosis incidence, the most common symptom of the SFAA is rupture (3). Therefore, the goal of their treatment

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is to prevent rupture and fully preserve extremity functions. Asymptomatic, smaller than 2.0 or 2.5 cm in diameter aneurysms may be safely observed. But, for larger asymptomatic and all symptomatic FAA, surgical repair is recommended. Here we reported an isolated saccular SFAA who admitted with distal micro embolism (Blue Toe Syndrome).

Case

In accordance with the Helsinki Declaration Principles, the patient was informed and a written approval has been taken for using the medical data and the figures those show the operation stages on 16/06/2017. Sixty nine years old patient admitted to cardiovascular surgery clinic with the symptom of bruising in his right 3th and 4th toes. In his medical history, he had insulin-dependent diabetes mellitus for 7 years, had chronic renal failure and he had been on hemodialysis for 3 years. No trauma and smoking history was present. In his physical examination, a functional Brescia-Cimino AVF was present on his left upper extremity at the wrist level. Peripheral arterial pulses were palpabl and the heart rhythm was regular. We performed an ultranonographic evaluation and detected an aneurysmatic dilatation in the right SFA. Computed tomography angiography revealed a saccular aneurysm with the diameter of 3.3 cm in the SFA, in Hunter`s Canal with no thrombus formation inside. Also, there was a large muscular artery arising from the aneurysm. No accompanying aortic or any other peripheral aneurysm was present. (Figure 1,2). The patient hospitalized. Pentoxifylline, iloprost and low molecular weight heparin started to be given as medical treatment. On the next day, after the patient's informed consent was taken, an elective aneurysm excision and interposition of 8 mm ringed PTFE graft performed under spinal anesthesia (Figure 3,4). Excised arterial material has evaluated in pathology department and SFAA diagnosis has verified histologically (Figure 5, Figure 6 A,B). The post-operative follow-up of the patient was uneventful. He was discharged on the post-operative 5th day with the medications of cilostazol 100 mg 2x1 (PO), pentoxifylline 600 mg 1x1 (PO) and clopidogrel 75 mg 1x1 (PO). His first week and first month controls were also uneventful. The wound healing was good, no signs of infection was present and peripheral pulses of the right lower extremity were palpable.

Figure 1. The CTA image of the SFAA (solid arrow), muscular artery arising from the aneurysm (dashed arrow) and SFA (dotted arrows).

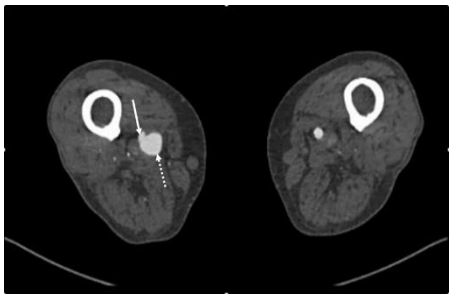

Figure 2. The sectional CTA image of the SFA (solid arrow) and SFAA (dotted arrow) in the Hunter`s Canal.

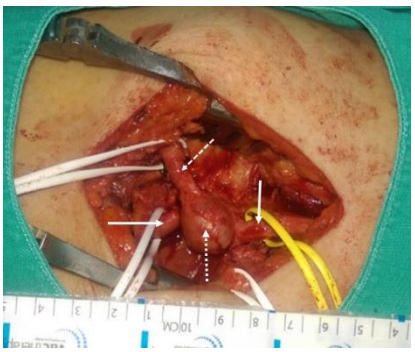

Figure 3. The intra-operative image of the SFA (solid arrows), SFAA (dotted arrow), muscular artery arising from the aneurysm (dashed arrow).

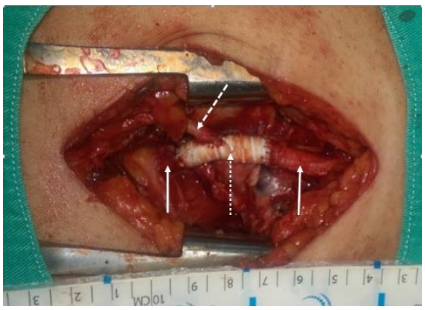

Figure 4. The final intra-operative image of the SFA (solid arrows), interposed 8 mm ringed PTFE graft (dotted arrow) and muscular artery anastomosed to the graft (dashed arrow).

Figure 5. The macro-pathologic image of the SFA (solid arrow), a guide wire passing through the SFA (dashed arrow) and the SFAA (dotted arrow).

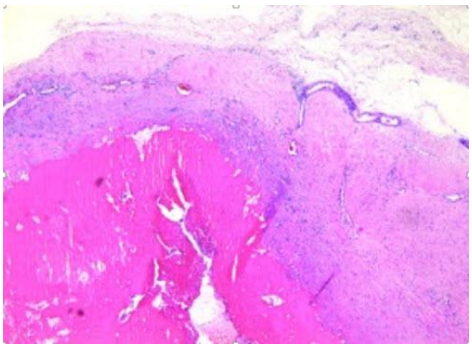

Figure 6A. Hematoxylin-Eosin (HE) X 40. Atherosclerotic plaque, thickening of artery Wall and fibrozis.

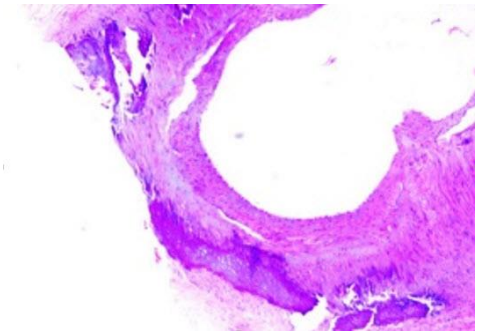

Figure 6B. Hematoxylin-Eosin (HE) x 40. Calcifications in the artery wall and dilatation of the arterial lumen.

Discussion

The diameters of the normal-healthy SFA varies between 0.78 - 1.12 cm in males and 0.78 -0.85 cm in females. The rate of the FAA to all peripheral aneurysms is 3%. Only 15-20% of these FAA is in the SFA, usually located in the distal 1/3 part of the SFA and rarely extend to the Hunter`s Canal (4-6). They are mostly seen in elderly males (>70 years) whilst, only 5-6% of FAA are seen females (3). Trauma, atherosclerosis, mycotic infection, inflamatory arteritis, connective tissue disorders (i.e. Marfan`s Syndrome), non-infectious-autoimmune diseases (i.e. Behçet`s Disease), and Human Immunodeficiancy Virus, smoking, hypertension are accepted as ethiological factors (7,8). Of the SFAA, 60% are seen together with abdominal aortic aneurysms and 36% are seen in both lower extremities simultaneously. Because of their deep position in thigh and asymptomatic nature, they are hard to be noticed (4). They can be apperent when they reach the over 8 cm of diameter and became symptomatic (4). Therefore, the leading symptom of the SFAA is usually rupture with a rate 30% to 50% which is much more higher than PAA (3). The other symptoms can be listed as acute ischemia, distal embolization, bruising or claudication in the lower extremity, deep venous thrombosis as a result of compression over superficial femoral vein and edema, a pulsatile mass in the thigh and pain due to mass when it reached to larger diameters. Surgical repair is indicated in all symptomatic patients for eliminating the pain, pressure of the pulsatile mass on the surrounding tissues, the source of potential distal embolies, preventing the rupture and providing the perfusion of the extremity. However there is no consensus for asymptomatic ones (3,4). Excision of the aneurysm with graft interposition (the most common technique), bypass or ligation of the aneurysm sac can be performed for surgical repair (3,4). Previous studies have shown that the graft potencies were 90% for 6 months and 85% for 5 years and the amputation rate was low (3). Current textbooks and studies recommend an elective surgical repair, for the aneurysms over 2.5 cm and/or in case of rapid enlargement of the aneurysm for asymptomatic patients (10). In recent years, endovascular treatment modalities can also be used in appropriate cases.

In conclusion, because of the asymptomatic nature of the SFAA in the early period, unless they do not keep in mind, they can be easily overlooked. When they rupture, they can cause to morbidity and mortality. Due to their occurrence especially in elderly patients with accompanying chronic diseases and their coincidence with aortic aneurysms and/or other peripheral artery aneurysms also increase their its mortality and morbidity. Therefore, when diagnosed, all symptomatic cases and even the asymptomatic ones with a critical enlargement should be operated or treated with endovascular techniques.

Informed Consent: Written informed consent was obtained from patient who participated in this case (16.06.2017).

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