



## Endovascular Management of a Giant True Aneurysm of the Deep Femoral Artery in a Patient with a History of Internal Diseases

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### Abstract

**Introduction:** Aneurysms of the deep femoral artery are rarely described in reports and represent a minor, 0.5% percentage of all aneurysms in peripheral arteries. Most commonly reported are false aneurysms. A report on stent-graft management of a giant true aneurysm of the deep femoral artery represents an important contribution to the discussion on this subject.

**Case Description:** A 72-year-old patient was admitted through the emergency channel due to pain and a pulsating tumor in the left groin. A CT angio scan showed a giant true aneurysm at the branching of the femoral artery. The aneurysm was managed endovascularly with a successful postoperative course.

**Discussion:** This paper represents a contribution to a discussion on therapeutic opportunities for the management of aneurysms of the deep femoral artery. The endovascular management appears to be an optimal solution, particularly in patients with a positive history of internal diseases.

### Introduction

Aneurysms of the deep femoral artery are rarely described in reports and represent a minor, 0.5% percentage of all aneurysms in peripheral arteries. Most commonly reported are false aneurysms. A report on stent-graft management of a giant true aneurysm of the deep femoral artery represents an important contribution to the discussion on this subject.

### Case Presentation

A 72-year-old patient was admitted to the clinic due to pain in a pulsating tumor in the left groin, present for several weeks, without an injury to that area recorded in medical history. The patient had extensive internal diseases: COPD, post two myocardial infarctions, insulin-dependent diabetes, hypertension and smoking for many years.

In the physical examination, a large pulsating tumor in the left groin was diagnosed. No signs of ischemia in the lower limb. The Doppler ultrasound scan confirmed a large aneurysm of the deep femoral artery, with its diameter involving a branching of the femoral arteries. The superficial femoral artery was permanently blocked. Diagnostic tests were extended to CT angio, which showed an obstruction of the iliac axis on the side opposite to the extensive true aneurysm in the branching of femoral arteries, of 45 mm × 52 mm in diameter (Figure 1). The aneurysm of the left deep femoral artery involved the left common femoral artery; and with the blocked iliac axis on the opposite side and the blocked superficial femoral artery on the same side this represents a configuration unfavorable for the endovascular access. Taking the above into account, it was decided to insert vascular access ports in the left brachial artery and to one of the branches of the deep femoral artery distally to the aneurysm. A stent-graft VIABANH 8 mm × 250 mm was implanted, with the proximal end of the stent-graft expanded in the healthy proximal section of the common femoral artery, and its distal end was inserted in the normal distal section of the deep femoral artery (Figure 2). Follow-up arteriography showed a very good result of the procedure; complete obliteration of the aneurysm was achieved, with the flow to the distal section of the deep femoral vein maintained. The procedure had no perioperative complications. The patient was discharged home on day three in good condition. During the 6-month follow-up monitoring, the patient was in good condition, the stent remained correctly patent, and the aneurysm thrombosed. Vascular accesses were closed with Agio-seal kits.

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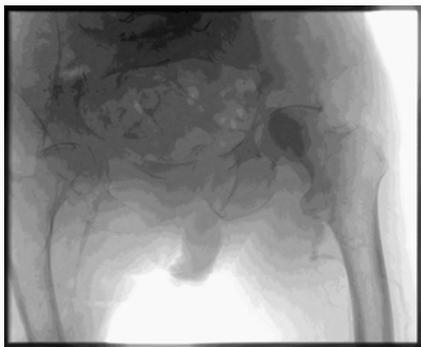
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**Figure 1:** CT angio showing an obstruction of the iliac axis on the side opposite to the extensive true aneurysm in the branching of femoral arteries, of 45 mm x 52 mm in diameter.



**Figure 2:** A stent-graft VIABANH 8 mm x 250 mm was implanted, with the proximal end of the stent-graft expanded in the healthy proximal section of the common femoral artery, and its distal end was inserted in the normal distal section of the deep femoral artery.

## Discussion

True aneurysms of the deep femoral artery are a rare situation. Usually, reports describe false aneurysms being a consequence of endovascular procedures, orthopaedic surgeries, or traumas. The number of reports on the endovascular management of aneurysms of the deep femoral artery is scarce.

The rupture of the aneurysm of the femoral artery represents a serious complication. In a series of cases of aneurysms of the deep femoral artery, reported by Harbuzariu, the percentage of ruptures was 13% [1]. In the literature review performed by us, this ratio ranged from 15% to 44%. The diameter of the deep femoral artery aneurysm is usually larger than of aneurysms of the superficial femoral artery (1.8 cm to 7.4 cm) [2]. In the reports, the diameter of ruptured aneurysms of the deep femoral artery ranges from 1.5 cm to 7.5 cm [1]. There is a general opinion that in the case of small aneurysms of the deep femoral artery of <2 cm, the risk of a sudden rupture is relatively small and the patient can be qualified for the planned procedure. Larger aneurysms are associated with a significant risk, and should be qualified for emergency surgical treatment [1].

The standard procedure for aneurysms of the deep femoral artery includes ligation or operative reconstruction of the vessel [2]. Ligation is a simpler procedure; however, it is associated with a significant risk of limb amputation in the postoperative course, in the case of concurrent advanced atherosclerosis of the superficial femoral artery. However, for the ruptured aneurysm, vascular reconstruction is a much more complicated procedure, therefore, in such cases ligation appears to be a reasonable alternative. Due to the large diameter of the aneurysm, the patient's medical history, and a significant risk of rupture, the authors decided on urgent endovascular management in that patient.

There are several reports available concerning the endovascular treatment of true aneurysms of the deep femoral artery by coil embolization [3,4]. Also, false aneurysms of the deep femoral artery were embolized using endovascular systems [5]. The case of our patient was complex and difficult to manage with surgical or endovascular methods. Due to the fact that the true aneurysm involved the branching of the femoral artery, together with the atherosclerotic obstruction of the entire iliac axis on the opposite side, as well as atherosclerotic blocking of the superficial femoral artery on the same side, a decision was made to implant a graft-stent to the aneurysm, thus maintaining the patency of the distal section of the deep femoral artery as the sole prevention of the limb ischemia. The vascular access from the distal section of the deep femoral artery was chosen as the only alternative.

In the authors' opinion, the complexity of our patient's case and the selected procedural solution represent an important contribution to the discussion on issues related to rare vascular problems in the form of large aneurysms of femoral arteries.

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