

# Endovascular Correction of a Post-Traumatic False Aneurysm of the Right Subclavian Artery. A Case Report

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*False aneurysm of the subclavian artery is an uncommon complication. Most frequently this pathology is caused by fracture of clavicle, however other causes also can exist. We present a case of diagnosis and endovascular treatment of a false aneurysm of the right subclavian artery in a 31-years-old man, heroin addict, who performed multiple injections into the right subclavian artery. At admission he had paresis and decreased sensitivity in the right arm due to compression neuritis of the brachial plexus. The diagnosis was made on the basis of clinical examination, duplex scanning, multihelix computed tomography (MHCT) and angiographic study of the subclavian vessels. With the account of large false aneurysm and difficulties of surgical approach we decided to abstain from open intervention.*

*A successful endovascular correction of the blood flow in the right subclavian artery using a stent-graft was performed.*

*This clinical example demonstrates that endovascular approach to the treatment of false aneurysms located in this area is associated with high clinical effectiveness, minimal traumatism and absence of blood loss.*

**Keywords:** false aneurysm, stent-graft, subclavian artery, brachial plexus.

## Abbreviations

RSA — right subclavian artery.

MHCT — multihelix computed tomography

## Introduction

According to the definition, the false aneurysm is a cavity filled with blood and communicating with the true arterial lumen. The walls of the false aneurysm are formed by the aneurysm-limiting tissues that do not contain the elements of the arterial wall (4,8).

Most commonly the false aneurysms of the subclavian artery develop after traumatic lesions of the clavicular area (4, 8, 11). As a rule, this pathology is diagnosed late, which is mostly related to the gradual increase of the volume in the clavicular area and the appearance of the signs of brachial plexus compression (6,9,12).

## Clinical case

A 31-years-old man was admitted to the Department of Surgery of the Irkutsk Regional Clinical Hospital in January 2010 with the diagnosis of a right-sided post-traumatic aneurysm of the subclavian artery. The patient was heroin addict. He attributed his disease to drug injection into the right subclavian area about 2 months ago. Palpation revealed a mass of about 7 cm in diameter in the right supraclavicular area, at auscultation a systolic murmur was heard.

There was paresis and decreased sensitivity in the right arm.

Duplex scanning of the right subclavian and axillary vessels was performed.

The signs of phlebothrombosis of the right subclavian and axillary veins were revealed. A heterogeneous, roundish mass measuring 60x40 mm, with an intraluminal parietal thrombus and turbulent blood flow was found at the anterolateral wall in the projection of the 2nd segment of the right subclavian artery (RSA). This cavity was connected with the lumen of the right subclavian artery through a 4 mm channel.

MHCT also confirmed the presence of a thrombosed aneurysm of the 2nd segment of the RSA.

Taking into account the big size of this aneurysm as well as the difficulties of surgical intervention, we decided to abstain from open surgery.

The patient was transferred into the cathlab for elective angiographic study and solution of the problem of endovascular correction of his false aneurysm. The right common femoral artery was punctured in accordance with Seldinger technique. A catheter was advanced into the RSA ostium through a 5F sheath and angiographic study was performed. In the 2nd segment of the RSA we found a post-traumatic multi-chambered false aneurysm (53x64 mm) with turbulent blood flow and protracted retention of the opacified blood (fig. 1). The RSA was 7 mm in diameter. The length of the damaged segment was 50 mm. After the evaluation of x-ray semiotics we decided to perform endovascular separation of the RSA from the false aneurysm cavity. After the puncture of the left common femoral artery a 9F sheath was inserted. A peripheral stent-graft Fluency plus (BARD) 9.0 x 60,0 mm was advanced by the cord guide and implanted in the plane of the aneurysm's neck. At control an-

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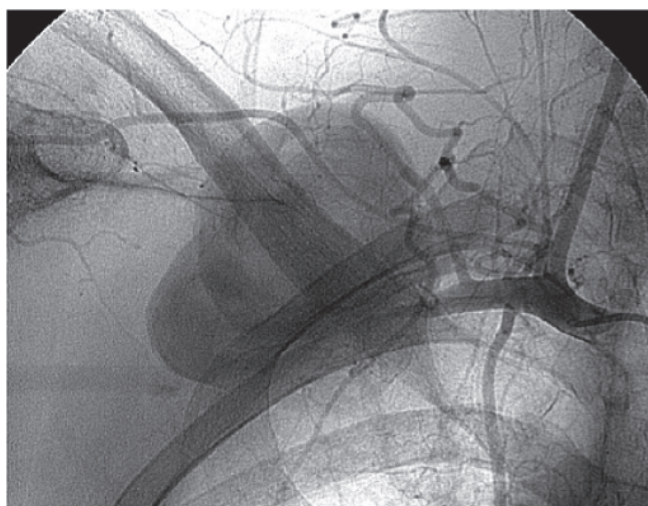


Fig. 1

giography the false aneurysm did not opacify, the blood flow in the stented segment was preserved, there was an over 50% stenosis in the initial segment of the implanted stent. Balloon dilatation of this segment was performed with the use of AgilTrac balloon (Guidant) 6.0x40.0 mm.

Control angiography revealed a stented segment with regular contours, without residual stenosis. The aneurysm was not opacified (fig2).

Control duplex scanning in the projection of the 2nd segment of the RSA revealed a heterogenous roundish mass measuring 60 x 40 mm, with intraluminal parietal thrombosis, located at the antero-lateral wall. Turbulent blood flow was not seen. The stent-graft was patent, the magistral blood flow was preserved.

Postoperative condition of the patient was satisfactory. He had no complaints. The symptoms of compression neuritis of the brachial plexus regressed. In 7 days after endovascular intervention the patient was discharged under the care of a local physician.

### Discussion

The lesions of the subclavian artery can be caused by penetrating injury by the fragments of fractured clavicle, the displacement of metal elements of constructions used for osteosynthesis (6, 7, 9, 10, 12). Paresthesia and paresis of the arm are typical symptoms of brachial plexus compression (6, 9, 12). As a rule, the time interval between the primary trauma and the diagnosis of a false aneurysm is long. Skeletal and muscular lesions as well as the gradual growth of the aneurismal cavity hamper timely diagnostics and treatment of this condition. Severe neurological abnormalities, related to the compression of brachial plexus, compression embolism of the subclavian vessels, as well as the rupture of false aneurysm with the development of arterial bleeding, are severe, life-threatening complications.

Open surgical approach in various segments of the subclavian artery is associated with sternotomy



Fig. 2

or the resection of a fragment of clavicle with subsequent osteosynthesis, is rather traumatic and elongates the rehabilitation period. The risk of wound infection and massive blood loss is always higher with open surgery (3, 5, 7, 10, 12).

Endovascular treatment is minimally traumatic, minimizes the blood loss and the probability of infection. The rehabilitation period after intravascular intervention is enormously shorter in comparison with open surgery.

There are few reports of such cases in world literature (1, 2). However we did not find any description of endovascular correction of a post-injection false aneurysm with the use of a stent-graft.

### Conclusion

Due to currently available materials and technologies, the method of endovascular separation of the false aneurismal cavity from the true arterial lumen allows to obtain good results in the correction of vascular wall lesions.

Minimal invasiveness, high effectiveness, absence of blood loss allow to consider the endovascular method as one of the leading modalities of treatment of false aneurysms of different genesis.

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