

PROFESSIONAL PAPER

Non-invasive Ultrasound Guided Compression Repair of Post Puncture Femoral Pseudo aneurysm

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Background: Pseudo aneurysm (PSA) of femoral artery is the second common post puncture complication. If PSA is less than 18 mm, it can be closed spontaneously and it can be asymptomatic. If not, it needs treatment. The most common non invasive method used in the treatment is ultrasound guided compression (UGC) with duplex color Doppler. In the treatment of PSA, other options are available, such as thrombin and collagen injection in the PSA sack, application of stent, but they are more invasive, with more complications than UGC. **Material and method:** Retrospective study was performed in the period from 2005-2010. During this period, 4575 punctions of femoral artery were performed. Because of suspected PSA of femoral artery, we examined and diagnosed 28 PSA in the ward of ultrasound diagnostic. Data regarding the location and morphologic characteristics of PSA, morbid disease were documented. **Results:** UGC was performed in 22 PSA patients, 12 men and 9 women, with average age of 48 years. 20 PSA were obliterated, while 2 remained persistent even after second attempt, and they were surgically treated. Efficacy of this method was 90%. Control examination was performed after 12 and 24 hours, and after 1 and 3 months. Intra- and after procedural complications were not observed. **Conclusion:** Non invasive treatment of PSA with UGC is cheap, efficient and easy to perform, with minor complications in well selected patients. **KEYWORDS:** PSEUDO ANEURYSM (PSA) OF FEMORAL ARTERY , ULTRASOUND, ULTRASOUND GUIDED COMPRESSION (UGC)

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1. INTRODUCTION

After bleeding, pseudo aneurysm (PSA) of femoral artery is second common post puncture complication (1). It is manifested by pulsatile hematoma, palpable flow and compressive pain in the region of puncture (Figure 1). Frequency of PSA is from 0,1 to 0,7% in diagnostic procedures, and from 1 to 3 % in interventional and therapeutic pro-

cedures (2). The most common reasons of arising of PSA are: long-term anti-coagulant therapy, usage of sheet size larger than 6 french, low puncture of the main branch of femoral artery, hypertension and inadequate compression after procedure.

If PSA is less than 18 mm, it can be closed spontaneously. If it is not closed spontaneously, in order to prevent

possible complications such as bleeding, rupture of PSA, periphery embolism, necrosis of skin, treatment is indicated. The most common non invasive method in the treatment of PSA is UGC with duplex color Doppler by linear probe from 7,5 to 10 MHz. Indications for this method are: stable slow-growing PSA, PSA less than 6 cm, location below lig. inguinale, PSA with narrow and long neck.

In the treatment of PSA, other options are available, such as thrombin and collagen injection in the PSA sack, application of stent, but they are more invasive, with more complications than UGC. Surgery is reserved for PSA larger than 6cm and after unsuccessful UGC. We performed retrospective study to evaluate the efficacy of this method in patients with PSA after cardiology interventions.

2. MATERIAL AND METHODS

Retrospective study was performed in the period from 2005-2010. During this period, 4575 punctions of femoral artery were performed, 3200 in the Department of intervention cardiology, and 1370 in the Department of diagnostic and intervention radiology. Because of suspected PSA of femoral artery, we examined and diagnosed 28 PSA in the ward of ultrasound diagnostic. Data regarding the location and morphologic characteristics of PSA, morbid disease were documented.

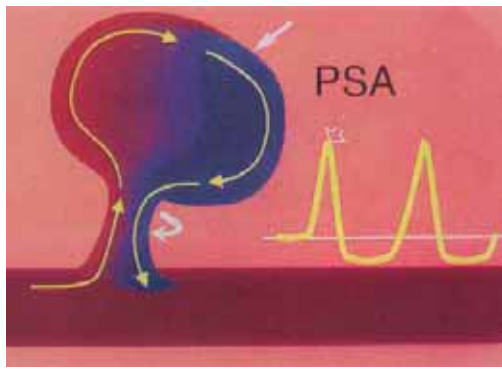


FIGURE 1. Layout of PSA

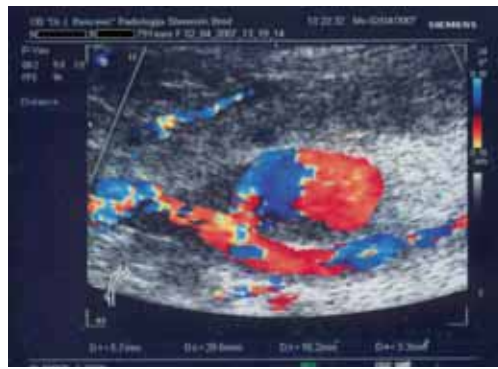


FIGURE 2. PSA with the size and location of compression.

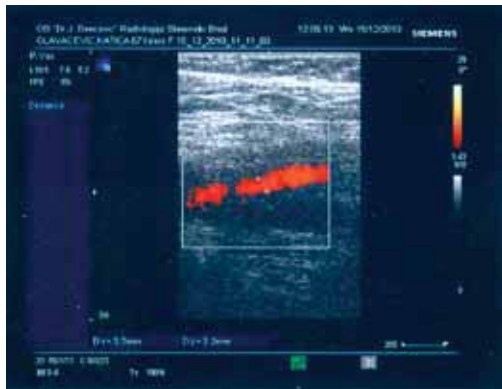


FIGURE 3. Complete obliteration of PSA.

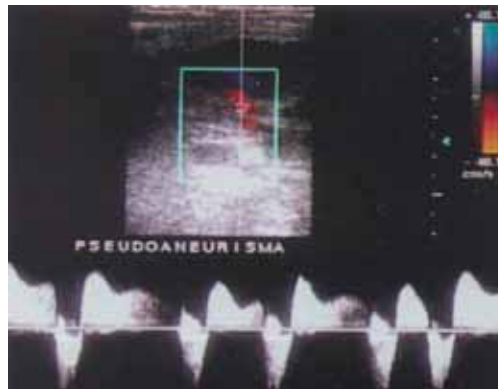


FIGURE 4. Spectral demonstration of flow and speed in PSA „to and fro“.

2.1. Technique

Compression was performed in the region of the neck of PSA with linear probe of duplex color Doppler (Figure 2), until the circulation in PSA was stopped. Compression was done in intervals of 4x10 min., with examination of periphery vessel circulation. Examination was performed after 12 and 24 hours, and after 1 and 3 months. Intra- and after procedural complications were not observed (Figure 3).

3. RESULTS

Spontaneous closure of PSA were observed during 5-7 days of monitoring in 6 PSA which were less than 18 mm. UGC was performed in 22 PSA patients, 12 men and 9 women, with average age of 48 years. 20 PSA were successfully obliterated (closed), while 2 PSA remained persistent even after second attempt, and they demanded surgery. In these two cases, PSA were larger than 5 cm, patients used anticoagulant therapy for longer time, and large sheet (7 french) was used. The efficacy of this method was 90%. We did not observe

any complication neither during the procedure nor after compression.

4. DISCUSSION

Despite the availability of multiple modalities like surgery, thrombin injection, UGC seems to be the most attractive and effective method (2, 3). Application of duplex color technique diagnosis and measurement of the size and flow in PSA “to and fro”, visualization of neck with artery and precise assessment of the location of compression, become available (Figure 4). Although the large number of therapeutic options is described in literature, UGC has efficacy from 70 to 100% (2, 5). In our study, the efficacy was 90 %, without observed complications, and the procedure was stopped if patient had pains or due to therapist fatigue. In our study, the reasons for unsuccessful treatment were large PSA, anticoagulant therapy, large sheet size and hypertension. Similar reasons were reported by other studies (6). Unsuccessful compression therapy and fast growing PSA demand surgical treatment because spontaneous closure

or obliteration of PSA is very rare. We did not use thrombin injections, because UGC was performed in the diagnostic ward, with staff not trained for treatment of possible complications, although thrombin injection may be more promising with success rate of 94% and less pain compared to UGC (7). However, if thrombin is not available, then UGC appears to be the treatment of choice for managing patients with PSA. Non invasive treatment of PSA with UGC is cheap, efficient and easy to perform, with minor complications in well selected patients.

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