Delayed pseudoaneurysm repair: A case report

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RW Franz, C Hughart. Delayed pseudoaneurysm repair: A case report. *Int J Angiol* 2007;16(3):119-120.

Iatrogenic pseudoaneurysms are a complication of arterial catheterization performed for both diagnosis and intervention. Their incidence is approximately 1% following diagnostic catheterizations and 3.2% after interventional procedures. The symptoms of iatrogenic pseudoaneurysm are pain and swelling. The preferred method of

treatment consists of thrombin injection under ultrasound guidance, although compression can be used. Most published research describes pseudoaneurysms that occurred close to the time of catheterization; the present case report describes a patient who presented two years postcatheterization with a symptomatic pseudoaneurysm.

Key Words: *Iatrogenic illness; Pseudoaneurysm; Thrombin*

Iatrogenic femoral pseudoaneurysm is a false aneurysm formed by a percutaneous procedure on an artery. Causes include arterial punctures for endovascular procedures, line placement and trauma to the arterial wall. In the present report, we discuss a patient who presented two years after cardiac catheterization with an iatrogenic pseudoaneurysm of the left common femoral artery.

CASE PRESENTATION

A 61-year-old woman presented with a complaint of left groin and left lower quadrant abdominal pain. The patient had felt a small mass in her left groin. Her medical history included coronary artery disease, osteoarthritis, chronic obstructive pulmonary disease, hypertension and hypercholesterolemia. Two years before presentation, she had undergone a cardiac catheterization, after which she first noted swelling in the groin. The patient reported progressive enlargement of the swollen region over the past two years.

Physical examination revealed a bruit in the left groin with a palpable, nonpulsatile mass. The distal pulses were strongly palpable and all other physical examination findings were within normal limits.

A noncontrast computed tomography scan of the abdomen and pelvis revealed a 4.6 cm × 5.5 cm pseudoaneurysm of the left common femoral artery with a lumen measuring 3.2 cm × 3.8 cm. Subsequent ultrasound examinations confirmed a pseudoaneurysm of the left common femoral artery measuring 5.6 cm × 4.1 cm. The neck of the aneurysm measured 0.67 cm (Figure 1).

The patient underwent an ultrasound-guided thrombin injection into the left common femoral artery pseudoaneurysm with 4 mL of bovine thrombin. Subsequent ultrasound examination confirmed complete resolution of the pseudoaneurysm and a patent left common femoral artery (Figure 2). The patient remained on bed rest for 2 h post-treatment. An ultrasound examination 48 h post-treatment showed complete resolution of the pseudoaneurysm; ankle-brachial indexes were normal (greater than 1.0).

DISCUSSION

The common femoral artery is the most common site for iatrogenic pseudoaneurysm formation. Pseudoaneurysms at this site usually have long, narrow necks (less than 10 mm) (1). The incidence of pseudoaneurysm formation is approximately 1% with diagnostic studies but increases to 3.2% when an interventional procedure is performed (2). Their incidence increases with multiple catheterization procedures on the same vessel (3). Other factors contributing to pseudoaneurysm formation include length and complexity of surgery, use of anticoagulants and early mobilization (1). Symptoms of pseudoaneurysm include pain due to increased pressure from swelling or nerve compression, and extremity swelling due to venous compression. Further complications of pseudoaneurysms include deep venous thrombosis or rupture, the risk of which increases with increasing pseudoaneurysm size (1). Iatrogenic pseudoaneurysms occur in the upper extremity less than 2% of the time, yet this site is more likely to experience functional or neurological damage. Functional or neurological damage is less likely to occur if the axillary artery is avoided (4).

Originally, treatment consisted only of open surgical repair. The current treatment of choice for pseudoaneurysms consists of an injection of between 0.5 mL and 1.0 mL of thrombin (1000 units/mL), via a 20 to 22 gauge needle, into the aneurysm under colour-flow Doppler guidance. Our patient required 4 mL of thrombin. This procedure can be performed in an average of 15 min (1). After injection, the feeding artery must be visualized via ultrasound examination to assure patency. Thrombin injection should be avoided in short-neck aneurysms due to the increased risk of thrombosis of the feeding artery (5). After the procedure, the patient should remain on bed rest for 2 h to 4 h, followed by careful and limited mobilization.

Initial thrombin injection is successful in 94% to 100% of attempts (1). Unresponsiveness to thrombin injection is an indication for open surgical repair. Side effects reportedly associated with thrombin injection include seizures, anaphylaxis

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Figure 1) Ultrasound image of pseudoaneurysm of the left common femoral artery

(human thrombin may be less immunogenic than the bovine form), systemic activation of the coagulation system, risk of limb ischemia with intra-arterial injection, blue toe syndrome, groin abscess and crampy buttock pain (4).

Another treatment modality is ultrasound-guided compression (6). However, this modality is associated with only a 60% success rate. Other disadvantages include increased time to result (30 min to 140 min versus 15 min for thrombin injection), pain and prolonged hospital stay due to the need for multiple attempts (1). Advantages of this modality include a lower chance of occlusion of the native vessel and no risk of the side effects associated with the systemic injection of thrombin.

CONCLUSION

Iatrogenic pseudoaneurysm is a relatively well-known entity. Treatment by thrombin injection is a simple and highly effective procedure. Previous published reports of this complication either have not addressed the time interval from the catheterization procedure to presentation and treatment for pseudoaneurysm or have reported cases occurring shortly after the catheterization procedure. This case was unusual due to the two-year time lapse from the catheterization procedure to the presentation for treatment of the complication. The present case suggests that thrombin injection for the treatment of

Figure 2) Postprocedure ultrasound showing complete resolution of the pseudoaneurysm, as well as a patent artery

iatrogenic pseudoaneurysm may be as effective in treating late-occurring pseudoaneurysms as for pseudoaneurysms occurring shortly after the catheterization treatment.

ACKNOWLEDGEMENT: The authors acknowledge the editorial assistance of Janet L Tremaine ELS, Tremaine Medical Communications, Dublin, Ohio, USA.

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