Short communication

Percutaneous closure of iatrogenic femoral pseudoaneurysms with thrombin injection

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ABSTRACT

Iatrogenic femoral artery pseudoaneurysm (IFP) is a tedious complication of percutaneous coronary and peripheral interventions which prolong the in-hospital stay. It's overall incidence may increase to 8% in the therapeutic complex procedures. Surgical correction is a traditional approach which is still preferred as a first resort in the many cardiovascular centers in the Turkey. Herein, we aimed to demonstrate the feasibility of percutaneous closure of IFP with thrombin injection.

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Introduction

Iatrogenic femoral artery pseudoaneurysm (IFP) is a kind complication of percutaneous coronary and peripheral interventions which would prolong the in-hospital stay. It is not uncommon condition and its incidence was reported as 2.3% in the large cohort from Turkey.¹ Its overall incidence may increase to 8% in the therapeutic complex procedures.² Surgical correction is a traditional approach which is still preferred as a first resort in the many cardiovascular centers in the Turkey. Herein, we aimed to demonstrate the feasibility of percutaneous closure of IFP with thrombin injection.

Case report

A 68 year-old male patient admitted to hospital with a complaints of groin pain and ecchymosis in the right thigh. On medical background, angioplasty and stent performed to left superficial femoral artery 5 days ago via right femoral route using 8F introducer sheath. Doppler ultrasonography revealed 2 × 10 cm femoral pseudoaneurysm formation with a relatively narrow neck (Fig. 1). After initial evaluation, ultrasound guided manual compression was performed for 60 min. However, flow in the pseudoaneurysm was persisted. After that, 2 ml–1000 units of thrombin (Tisseel Iyo -Baxter) was injected into aneurysmal sac slowly (Fig. 2). Control Doppler ultrasonography showed cessation of diverted flow inside the pseudoaneurysm (Fig. 2). One week

control also showed complete embolisation of pseudoaneurysm with patent superficial femoral artery (Fig. 3).

Discussion

Pseudoaneurysms are one of the most major complications at the puncture site after catheterization percutaneous interventions. It is more common in elderly and women and it is associated with obesity, high dose antiplatelet regimen and prolonged complex vascular interventions.¹ Basic therapeutic approach was defined as ultrasound-guided manual compression. Success rate was near to 50% and closure rate is more prominent in the pseudoaneurysms smaller than 20 mm.³ Ultrasound-guided manual compression is more effective in the patients who are not in anti-coagulative treatment, but may require prolonged compression and cause pain and discomfort. Ultrasound-guided percutaneous thrombin injection is going to be gold standard for IFP with clearly definable neck anatomy.^{2–4} In addition, dual antiplatelet therapy did not reverse the thrombin effect and size of the pseudoaneurysm is not limited factor. However, IFP without definable neck, IFP directly adjacent to vessels and IFP with concomitant arteriovenous fistula are not appropriate candidate for thrombin injection.³ Amount of thrombin injection may vary according to size of pseudoaneurysm and operator preference. It was reported that 200–1000 units of thrombin might be enough to close pseudoaneurysmal sac.⁵ Gentle and precise injection of the thrombin is crucial since, leakage of tiny amount of thrombin may lead to thrombosis of main vessel and it can trigger acute limb ischemia.⁶ Injection of small incremental doses of thrombin may decrease the complication rate. In our case we injected

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Fig. 1. Doppler ultrasonography show the pseudoaneurysm with definitive neck and hematoma formation.

Fig. 2. Injection of thrombin solution to pseudoaneurysmal sac.

relatively higher dose of thrombin (1000 units) without any complication and flow in the pseudoaneurysmal sac was completely obliterated.

Graft stent deployment could be alternative therapy in unfavorable anatomic situation for thrombin injection.⁷ Surgical correction should be last resort in the treatment of IFP, and it should be preferred in the setting of imminent rupture, massive hematoma and skin necrosis.

Conclusion

Iatrogenic femoral artery pseudoaneurysm will continue to become a major vascular complication parallel to increment in the percutaneous complex vascular intervention. Ultrasound guided thrombin injection is safe and effective in the IFP with definitive neck anatomy. Habitual

Fig. 3. Doppler ultrasonography show the complete obliteration of the flow within the pseudoaneurysm.

traditional surgical approach should be last resort in the treatment of IFP which is still not applicable in the current practice of our country.

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