

Case Report

Could direct-acting oral anticoagulant be a possible cause of delayed pseudoaneurysm? A case report

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Abstract

Delayed iatrogenic pseudoaneurysm (IPA) is very rare. We aimed to present a case of delayed femoral IPA using apixaban, which developed four months after coronary intervention (PCI). A 75-year-old female patient who had PCI four months ago presented with right femoral artery IPA that started one month ago, with no recent history of trauma, infection, or new procedures, except for diabetes and apixaban use. The occurrence of IPA at the insertion site four months after the initial procedure is an infrequent complication. Delayed IPA risk factors are trauma, infection, anticoagulant use, and inflammatory disease. Since no other risk factor was found in our case, the cause of IPA seems to be apixaban. Our case highlights the importance of considering delayed IPA as a potential complication, which may manifest up to four months after the initial procedure, especially in diabetic patients who are on anticoagulant therapy.

Keywords: Pseudoaneurysm, DOAC, apixaban

INTRODUCTION

Femoral artery access is the primary approach used for coronary and peripheral artery catheterization procedures worldwide. The incidence of iatrogenic pseudoaneurysm (IPA) increases with the increase in the number of femoral artery access and the use of anticoagulants such as the direct-acting oral anticoagulant, sodium warfarin. Femoral pseudoaneurysms are seen in 0.2-8% after diagnostic and interventional procedures [1]. IPA occurs at the puncture site as a complication of percutaneous arterial catheterization; unlike true aneurysms, it occurs because of the inability to close the arterial puncture hole in the artery with a strong clot. Typically, symptoms of IPA appear immediately

after the procedure, usually within the first 24 hours after sheath removal, although cases of delayed IPA have also been reported 7 to 10 days after the procedure. Although late IPA is seen due to the use of anticoagulants, delayed IPA months after the procedure is an extremely rare complication.

In this case report, we aimed to present a case of delayed femoral artery pseudoaneurysm using apixaban, which developed four months after coronary angiography.

CASE REPORT

A 75-year-old female patient with atrial fibrillation, who was using apixaban and had a history of coronary artery disease,

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hypertension, and diabetes, was admitted to the emergency department with complaints of increasing swelling and pain in the right groin. She said that the swelling in her groin had been present for the past month and before that her groin was not normal. She had no history of trauma, infective or inflammatory disease. It was learned from the patient's medical history that coronary intervention was performed from the right femoral artery four months ago. No other risk factors were found from the patient's medical history that could be the possible cause of IPA such as connective tissue disease, trauma, or infection. Physical examination on admission revealed a painful and tense pulsatile mass with a size of 8x10 cm on the right groin (Figure 1).



Figure 1. Preoperative view of right femoral pseudoaneurysm

There was a 4 cm diameter difference in the right limb. She was hemodynamically stable, routine laboratory examinations were within normal limits. Color Doppler ultrasonography showed a pseudoaneurysm originating from the common femoral artery with typical yin-yang signs. Lower extremity CT angiography revealed a pseudoaneurysm lesion originating from the right common femoral artery, reaching 10 cm at its widest point, and compressing the right superficial femoral vein (Figure 2).

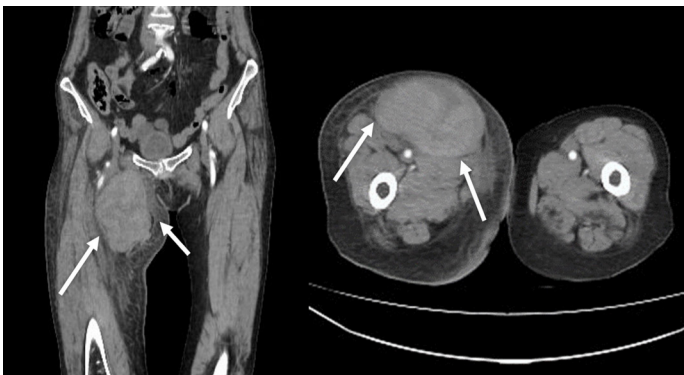


Figure 2. Frontal and sagittal CT angiogram view of right femoral artery pseudoaneurysm

Under general anesthesia, 10-cm vertical skin incision was made to the right groin. After intravenous heparin (100 U/kg) administration, control of the proximal common femoral artery and distal superficial femoral artery was achieved using vessel rings and angled vessel clamps. It was observed that the pseudoaneurysm sac was 12x9 cm in size. The pseudoaneurysm sac was opened and a large amount of old and new clot was evacuated (Figure 3).

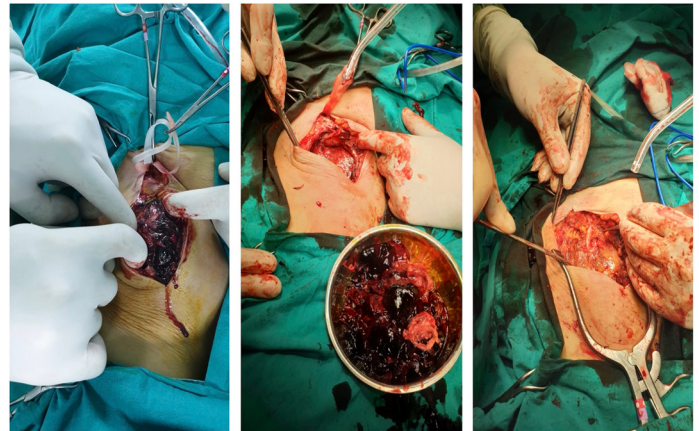


Figure 3. Operative view of femoral artery pseudoaneurysm

An active bleeding puncture hole on the CFA was repaired with 6/0 propylene. Pressure on the femoral vein disappeared after the procedure. Following successful bleeding control, a hemovac drain was inserted and the tissue layers were closed. The patient's postoperative course was uneventful, with a return to mobility on the first day after the operation. The patient was subsequently discharged from the hospital four days after the procedure.

DISCUSSION

Delayed IPA at the insertion site, occurring four months after the initial procedure, is an extremely rare complication. While IPAs are typically noted within the first 24 hours post-procedure, delayed presentations have been reported up to 10 days after the initial procedure [2]. Shindo S. et al. [3] reported that five delayed femoral pseudoaneurysms were detected in 573 patients who underwent PCI. It was reported that most of these five cases were seen one month after the procedure. However, as far as we know, we did not find any case of delayed IPA four months after the procedure in the literature. The case presented here is quite interesting in this respect.

One of the main factors in the development of pseudoaneurysm is loss of elasticity in the femoral artery. Loss of elasticity in the femoral artery prevents spontaneous closure of the puncture site and prevents safe compression after catheter removal [3]. Serious arterial calcifications, especially seen in diabetes and chronic renal failure, are important causes of loss of elasticity. In the case we presented, there was also severe femoral calcification and loss of elasticity, which suggested that it could be a contributing factor in the development of IPA.

Infections and multiple arterial punctures are other important factors in the development of delayed IPA [4]. Multiple arterial punctures and tear at the edge of the puncture point are an important cause of delayed IPA. Such factors both prevent spontaneous closure of the entrance hole and cause a decrease in the effectiveness of the pressure to be applied after the procedure. In our case, there was neither evidence of infection nor multiple femoral artery entry holes, which can be considered as a possible cause of delayed IPA.

Safe hemostasis is mandatory to prevent false aneurysm formation after PCI. However, if the arterial access hole is not closed for any reason, the hematoma continues to accumulate, and delayed IPA may occur. Spontaneous resolution of IPA may occur when the size of the aneurysm is small, and anticoagulation is not applied. [5]. However, most patients must take anticoagulant or antiplatelet drugs following PCI. Therefore, spontaneous resolution is unlikely in patients receiving anticoagulation therapy.

As an oral anticoagulant, apixaban works by directly inhibiting both free and clot-bound factor Xa, preventing thrombin production and clotting [6]. There are some papers reporting a possible link between apixaban and spontaneous pseudoaneurysm formation. Guirgis M. et al. [7] reported a case of visceral pseudoaneurysm associated with apixaban use. Faraj J et al. [8] reported a case using apixaban as a possible cause of median sacral artery pseudoaneurysm. In our case, the exact cause of the IPA could not be determined, but we think that the patient's use of apixaban for atrial fibrillation may be one of the contributing factors. Our patient was taking apixaban 5 mg twice a day.

As a result, we could not explain the exact cause of delayed IPA in this case. However, after excluding other possible risk factors such as trauma, infection, and connective tissue diseases, no explanatory risk factor remained other than the use of apixaban and diabetes. Therefore, we speculate that the initial small and asymptomatic IPA of the patient became symptomatic rather than closing over time due to apixaban.

CONCLUSION

Femoral IPAs are typically seen in the early period after percutaneous interventions. However, it should be kept in mind that the development of IPA may appear as late as four months, especially in patients who are diabetic and using anticoagulants.

Patient informed consent: Written informed consent was obtained from the patient's legal guardians.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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