



Kasuistika | Case report

Intercostal artery pseudoaneurysm: A rare complication of coronary angiography*

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SOUHRN

Nalezení pseudoaneurysmatu mezižeburní tepny během koronarografického vyšetření představuje vzácnou, avšak potenciálně smrtelnou komplikaci a vyžaduje zvláštní pozornost, aby bylo možno včas stanovit diagnózu. Popisujeme případ pacienta, u něhož se během vyšetření perkutánní koronarografií vytvořilo pseudoaneurysma mezižeburní tepny a který přežil díky rychle stanovené diagnóze, urgentní péči a důsledné monitoraci jeho stavu.

Učební cíl: Zajistit, aby si lékař byl vědom možnosti takové komplikace, a byl tak schopen stanovit rychle diagnózu i poskytnout odpovídající léčbu.

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ABSTRACT

Intercostal artery pseudoaneurysm during coronary angiography is a rare but potentially lethal complication that needs special attention in order to make the diagnosis on time. We report the case of a patient who developed intercostal artery pseudoaneurysm during percutaneous coronary angiography, and who survived thanks to a rapid diagnosis, urgent care and strict monitoring.

Learning objective: Make the practitioner aware of such a complication in order to make a rapid diagnosis and an adequate management.

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Introduction

As the practice of interventional cardiology continues to push the limits particularly for the management of coronary artery disease, unprecedented complications start to occur jeopardizing patients life and requiring a special attention from the operators. Procedure-induced dissection or perforation is a rare but well-known complication. However, a search of the PubMed and Science Direct databases found no previous reports of intercostal artery pseudoaneurysm as a complication of percutaneous coronary angiography. We report the case of a patient who developed intercostal artery pseudoaneurysm during percutaneous coronary angiography, and managed adequately by a multidisciplinary team.

Case report

A 78-year-old woman with a history of uncontrolled hypertension, was admitted to our department for a 3-month history of intermittent episodes of retrosternal chest pain at rest lasting for 5–10 min and radiating to the left upper limb. She had a history of stroke 8 years ago without any sequelae and was on anti-inflammatory agents for osteoarthritis. There was no previous history of coronary artery disease. On physical examination, her blood pressure was 150/90 mmHg, and her pulse rate was of 60 beats/min. Cardiovascular and respiratory examination was normal. The ECG showed a sinus rhythm with ST segment depression in the lateral leads. The plasma levels of both troponin I and creatinine kinase on admission were within the normal range, as well as the other laboratory findings. Doppler echocardiography showed a normal left ventricular function with no regional wall motion abnormalities. The patient was considered as having a suspected unstable angina and was scheduled for a diagnostic coronary angiography, as she was not able to perform an exercise treadmill test.

Her coronary angiography was performed from the right radial artery using 6F left and right Judkins catheters. Local anesthesia with 1% lidocaine was done and

we have used a kit for percutaneous transradial cannulation that included a micro puncture needle (21 Gauge), a 0.018-inch guidewire, and 6-F hydrophilic-coated sheath (23cm in length). A cocktail of vasodilators (200 µg of nitroglycerin and 10 mg of lidocaine) was administered via the radial sheath.

The guidewire was then inserted through the needle and the sheath placed. However, a tactile resistance while advancing the wire was encountered. Fluoroscopy with contrast injection has shown a radial loop (Fig. 1). The next step was to use a straight, hydrophilic, steerable 0.035 wire allowing straightening the loop (failing angled wire available). We kept the same hydrophilic wire to advance quickly a diagnostic catheter through the arm and then the subclavian artery.

The angiography showed no significant coronary lesions. The procedure was completed, using a total amount of 50 ml contrast agent without any unexpected events. The total fluoroscopy time for the procedure was 6.3 min.

One hour after the procedure, the patient complained of right-sided chest pain radiating to the back with shortness of breath. The patient was immediately transferred to the coronary care unit and vital signs were checked and a thorough physical examination was carried out, which was unremarkable. There were no ECG changes, however the chest multidetector computed tomography (MDCT) angiography revealed a pseudoaneurysm that has a diameter of 8 mm, of the upper right intercostal artery approximately 2 cm from its emergence associated with a moderate right hemithorax without direct signs of active bleeding (high density contrast extravasation with irregular margins) (Fig. 2). The injured artery was a superior intercostal artery which is arising from the first part of the subclavian artery. The pseudoaneurysm was probably caused by an undetected move of the straight tip, hydrophilic wire into the intercostal artery.

The cardiac surgery team was immediately notified and the patient was given analgesics with strict monitoring of vital signs. Blood count revealed a fall of serum hemoglobin from 13 to 11 g/dl. A chest CT angiography performed 7 days later showed the stabilization of the pseudoaneurysm. The patient was discharged after 2 weeks and was doing well after 1 year of follow-up.



Fig. 1 – Difficulties to advance the straight tip guide catheter through the radial artery tortuosities.

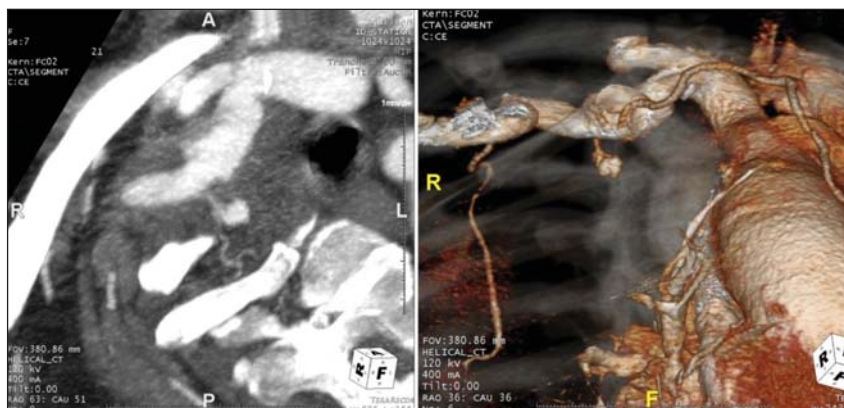


Fig. 2 – Chest CT: a pseudoaneurysm of 8 mm diameter of the upper right intercostal artery approximately 2 cm from its emergence.

Discussion

Intercostal artery pseudoaneurysms are extremely rare with, to the best of our knowledge, only ten reported cases worldwide [1]. While a true aneurysm of an intercostal artery may be associated with genetic disorders such as neurofibromatosis and coarctation of the aorta, the etiology of an intercostal artery pseudoaneurysm is mainly traumatic or iatrogenic, occurring after a sternotomy, thoracotomy or even thoracoscopy for lung biopsy [2].

A hemothorax, as a severe complication, was the initial presentation in five known cases, but an asymptomatic pulsatile mass has also been described [3].

Diagnosis is established by duplex examination or CT angiography and less frequently by intra-arterial subtraction angiography. In our case the digital subtraction angiography (DSA) was not performed.

Treatment should not be delayed since rupture of the pseudoaneurysm is a potential complication that may lead to death of the patient. Treatment options are endovascular embolization, surgical aneurysmectomy and, more recently, stent grafting has been applied. Ultrasound-guided thrombin injection is a known and easy-to-use treatment, with excellent results for femoral pseudoaneurysms.

The complication rate is very low, with only a few known cases where arterial occlusion occurred and vascular surgery was needed. In the literature, one case of successful ultrasound-guided percutaneous thrombin injection of an intercostal pseudoaneurysm has been described [4].

This case of an intercostal artery pseudoaneurysm illustrates one of the possible complications of percutaneous coronary angiography that can be prevented by not using straight tip guide wire and by carefully advancing

the guide wire under fluoroscopy guidance particularly in elderly female patients that are known to have tortuous radial arteries

Conflict of interest

The authors have no conflict of interest.

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None.

Ethical statement

I declare, on behalf of all authors, that the research was conducted according to Declaration of Helsinki.

Informed consent

I declare, on behalf of all authors, that informed consent was obtained from all patients participating in this study.

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