Life threatening, subclavian artery mycotic aneurysm rupture into a gigantic supraclavicular abscess in an intravenous drug user

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ABSTRACT

Subclavian artery injuries are sporadic, and the most common aetiology is trauma. Self-injury of the vessel in those misusing intravenous drugs is a rare complication, as most reports describe injury to the femoral artery. Thus, erosion and potential rupture of the arterial wall is possible due infection and phlegmon or abscess formation. We present a case of a young, female, hemodynamically unstable intravenous drug user admitted to the emergency department with a life-threatening, purulent haemorrhagic mass located at her right lateral cervical region. The patient admitted an inadvertent arterial puncture 10 days prior and an effort to self-manage the bleeding with the application of self-pressure and antibiotics. Computed tomography arteriogram of the neck revealed a gigantic, multicompartment, thick-walled collection with hyperdense fluid in her right supraclavicular region while active extravasation derived from the right subclavian artery was evident in late arterial phase. The patient was treated with endovascular graft stenting, despite the given presence of infection, as a salvage operation due to time limitation in open surgical repair.

KEYWORDS: Drug abuse, mycotic pseudoaneurysm, subclavian artery, endovascular treatment, subclavian artery rupture

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Case presentation

A 23-year-old female intravenous drug user was admitted to the emergency department with a painful, pulsating, ulcerative, bleeding, and purulent-excreting mass in her right lateral cervical region. The patient was hemodynamically unstable and in sepsis, with a temperature of 39.1°C, low blood pressure (systolic blood pressure 90 mmHg) and tachycardia. The patient admitted that she had an ineffective intravascular drug use (IVDU) in the right subclavian vein with a non-sterile needle 10 days prior, which was followed by excessive bleeding. The patient mentioned an effort to partially restrict the haemorrhage by self-compression.

Diagnosis

Laboratory examination indicated tremendously low haemoglobin levels of 2.4 mg/dL and sepsis, with elevated white blood cell count, neutrophil count and procalcitonin (PCT) levels.

The patient underwent a CT angiography (CTA) of the neck in order to investigate the nature and the extension of the mass. CTA revealed a massive, irregular, thick-walled fluid collection, with multiple compartments and heterogeneous hyperdense content, corresponding to both blood and pus. The thick-walled collection was extended from the right subclavian triangle and upwards, to the prevertebral and carotid space, displacing the structures of the midline of the neck, including the upper airway (Fig 1a). Importantly, the right subclavian artery appeared narrowed, while active extravasation from its proximal part into the aforementioned collection was evident in delayed arterial phase (Fig 1a–c). The proximal segments of both internal jugular vein and subclavian veins could not be outlined, possibly due to pressure from the aforementioned abscess formation. Extensive reactive lymphadenopathy, fat stranding and free fluid collection to the adjacent neck spaces were also present.

Initial management

The patient was intubated and transferred to the interventional radiology department. Digital subtraction angiography (DSA) verified the active blood extravasation (Fig 2a) Additionally, graft stenting of the right subclavian artery was performed (Fig 2b) to cease the bleeding, as a less invasive method admissible to her hemodynamically unstable status. The stent graft was successfully placed, eliminating the active bleeding extravasation (Fig 2c). The patient admitted to the intensive care unit (ICU) and received four units of red blood cellss, two units of platelets, four units of plasma and 2 g tranexamic acid.

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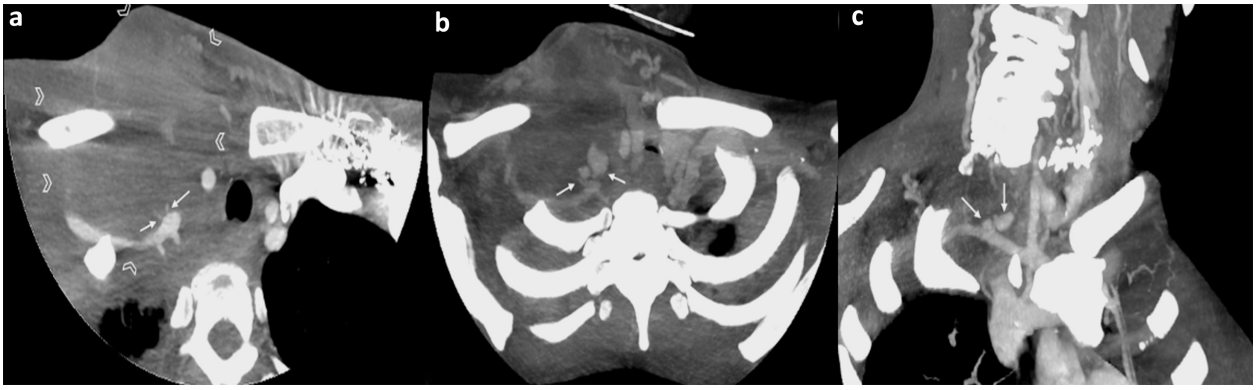

Fig 1. CT angiography (CTA) of the neck, revealing the massive purulent collection in the right subclavicular region and the active arterial extravasation.

Case progression and outcome

The abscess was partially drained immediately after the patient's admission to the ICU, and she was additionally treated with meropenem, rifampicin, dexamethasone and anticoagulant therapy.

The patient was discharged from the ICU 5 days later and remained in the surgery unit for 10 days. Upon hospital discharge, she was advised to attend for follow-up 15 days later in order to arrange vascular surgical treatment, but she didn't appear at the outpatient clinic. 10 months after her discharge, she was readmitted to the hospital with overdose drug poisoning and brain oedema, causing her death.

Discussion

Vascular artery injuries in intravenous drug abusers are uncommon, but challenging. Infected false aneurysms (IFA) designated as 'mycotic aneurysms' are the most frequent type of vascular injury. IFA formation in drug abusers arises from direct arterial wall infection from the contaminated needle. Another proposed mechanism involves the erosion and potential rupture of the arterial wall from an existing abscess formation in the perivascular area.[1,2] Other patterns of vascular injury include arteriovenous fistulas, thrombosis and direct vascular laceration.[1,3] Upper limb involvement is seen in less than 20% of these injuries, and the subclavian artery is only rarely described in the literature,[3] probably due to difficulty in access.

The main clinical symptom is a painful, tender, gradually expanding mass. The overlying skin is often erythematous. An important clinical feature is the pulsatility of the lesion.

CTA of the neck is the gold standard in diagnosis of arterial injuries and remains a reliable non-invasive diagnostic modality in planning the surgical or endovascular approach.[4,5]

Open surgical repair is the usual first-line management in both hemodynamically stable and unstable patients or in patients with contaminated surgical field. Nevertheless, endovascular repair may equally be considered, especially in institutions with access to a hybrid operating room. In our case, endovascular repair was performed as a salvage operation due to limited time and laborious exposure of the subclavian artery underneath the preceding massive abscess.[4,5]

For deep arteries like the subclavian artery, an endovascular approach might be more suitable, especially in hemodynamically unstable patients, where there is time limitation, either as a permanent solution or as a bridging procedure to surgery.[4,5] ■

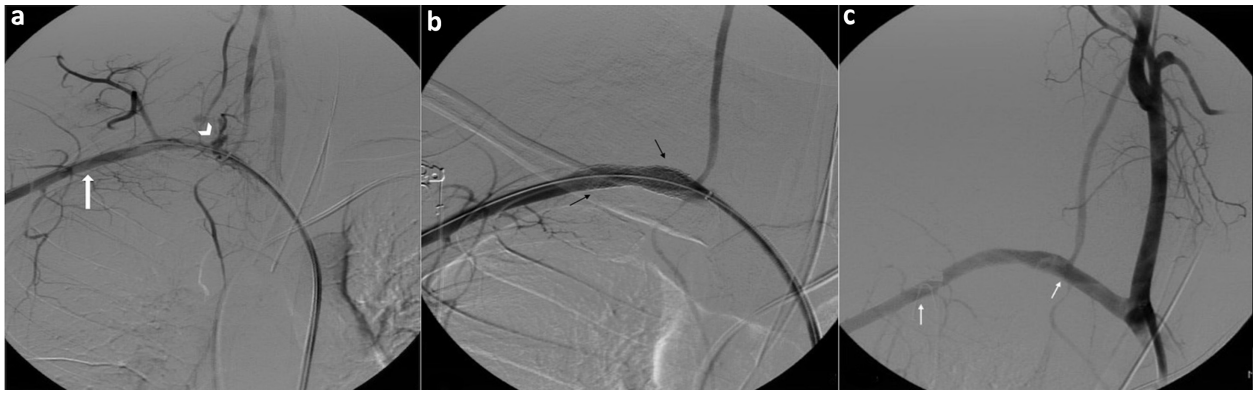

Fig 2. Digital subtraction angiography (DSA), depicting the active extravasation, the balloon insertion stent and the immediate cessation of hemorrhage.

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