SHORT REPORT

Pseudoaneurysm of the Ascending Aorta: a Rare Complication of Central Venous Puncture

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Introduction

Catheterisation of the central venous system via the internal jugular and subclavian vein is a commonly performed, almost standard procedure for various therapeutic and diagnostic purposes. The complication rate is generally low, including mainly pneumothorax, haemothorax, venous thrombosis and infection.¹

However, major damage to the adjacent arterial vessels as laceration, rupture and pseudoaneurysm of the subclavian artery, carotid artery and brachiocephalic trunk have been reported.²⁻⁴ We present an unusual but serious complication of internal jugular vein puncture, resulting in a pseudoaneurysm of the ascending aorta.

Case Report

A 53-year-old man was initially admitted to a local hospital for atypical precordial pain and discrete numbness of both legs. Previous medical history revealed insulin-dependent diabetes, arterial hypertension, chronic alcohol abuse and previous lumbar surgery for disc prolapse. Physical examination showed a morbidly obese man (123 kg, BMI >30) with an increased symmetrical blood pressure (195/100 mmHg) and a pulse of 104 beats per min. Body temperature was 38.5°C.

Heart and lung auscultation, as well as abdominal examination were normal. All peripheral pulses were present.

First laboratory findings showed increased white blood cell count (20 000/mm³), a raised sedimentation rate of 95 mm/h and CRP of 23.6 mg/dl. Blood cultures were positive for non-resistant Staphylococcus aureus. Electrocardiography suggested left ventricular hypertrophy. Finally, transthoracic echocardiography excluded underlying cardiac or aortic disease.

Although the initial diagnosis remained unclear, central venous access was achieved for antibiotic therapy, requiring several attempts at right internal jugular vein puncture, hindered by his extreme obesity and short, fat neck.

However, three days later, the patient was still complaining of precordial discomfort despite medical control of blood pressure and normalization of body temperature. Therefore, further investigation by a thoracic CT scan was carried out and this showed a periaortic hematoma and ascending aortic dissection, indicating the need for immediate transfer to a cardiac surgical unit.

Meanwhile, his clinical presentation was complicated by the progressive appearance of venous congestion signs in the upper limbs and neck, suggesting compression of the superior vena cava.

A new CT scan revealed a large periaortic mass at the junction between the calcified aorta and the brachiocephalic trunk, infiltrating the anterior mediastinum and partially compressing the superior vena cava (Fig. 1). Additionally, an angiogram confirmed
by the atherosclerotic character of the aortic wall. Again haemostatic control was easily achieved by direct suture.

Afterwards, postoperative recovery was uneventful despite some residual confusion, and his transfer to the low care unit was allowed on the seventh postoperative day. Unfortunately, he died suddenly from an irreversible ventricular arrhythmia one week later. Post-mortem examination showed an intact aortic repair, but did not reveal any obvious cause of his sudden death.

Discussion

Percutaneous central venous catheterisation is a frequently performed procedure, usually accomplished without complication. It is generally done blindly, guided by some anatomical surface landmarks and its successful application is mainly dependent on the operator’s experience and dexterity. However, several complications may occur, some with potentially lethal consequences.1

Amongst arterial injuries, accidental puncture of the subclavian or carotid artery is fairly common and often innocent. More severe lacerations may result in arteriovenous fistulae and pseudoaneurysm, often requiring additional surgical treatment.2–4

This case presents a very rare complication of several attempts at internal jugular vein cannulation, leading to the formation of a false aneurysm of the ascending aorta. Obviously, the catheter misplacement was made more likely by distortion of the usual landmarks because of the extreme obesity and short fat neck of this patient. Moreover, the severe calcified aortic atherosclerosis, especially located at the base of the brachiocephalic trunk, probably impeded spontaneous sealing of the arterial puncture wound.

In contrast to other reports of aortic injury after central venous catheterisation,5,6 cardiac tamponade the diagnosis of a false aneurysm of the calcified ascending aorta, filling through a pinpoint hole at the base of the brachiocephalic artery (Fig. 2).

Through a median sternotomy, surgical repair by resection of the pseudoaneurysm wall, removal of the clots and closure of the original puncture hole with simple suture on Teflon pledgets was carried out.

The early postoperative course was smooth, with extubation on the first day. However, severe and uncontrollable arterial hypertension resulted in increased mediastinal blood loss and rapid haemodynamic deterioration, indicating the need for urgent surgical re-exploration.

Extension of the original aortic tear provoked recurrent haemorrhage, which was certainly promoted the diagnosis of a false aneurysm of the calcified ascending aorta, filling through a pinpoint hole at the base of the brachiocephalic artery (Fig. 2).

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References


