

Pseudoaneurysm of subclavian artery – atypical presentation

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Abstract

We present a rare case of pseudoaneurysm of right subclavian artery who presented with supraclavicular mass. Injury of the subclavian artery causing pseudoaneurysm is a serious surgical emergency and a surgical intervention is indicated.

Key words: Aneurysm; Subclavian artery; Angiography; Neck; Wounds and injuries

Introduction

Arterial injuries to the base of neck, supraclavicular region and upper part of thorax are the most morbid of all vascular injuries (Reul *et al.*, 1973). Injury to the subclavian artery and innominate artery accounts for one to two per cent of all acute vascular injuries (Calhoun *et al.*, 1992; Sturm *et al.*, 1984). Blunt trauma is reported to be four times less common than penetrating injuries (Buscaglia *et al.*, 1987; Posner *et al.*, 1988). Mortality from subclavian artery injury has been reported to be around 30 per cent. George *et al.* (1991) and Richardson and Flint (1982) have reported penetrating trauma to be more lethal than blunt trauma. The morbidity and mortality from these injuries is associated with severity of trauma and other associated injuries. Porcellini *et al.* (1996) have recommended resection and anastomosis to be the ideal treatment. We report our experience with the management of a pseudoaneurysm of the subclavian artery which had presented as a vascular mass in the neck.

Case report

A 48-year-old male patient presented to the department of Otolaryngology and Head–Neck Surgery of the Postgraduate Institute of Medical Education and Research, Chandigarh, India with a gradually increasing swelling on the right side of neck present for eight years. He had been involved in a road traffic accident nine years previously, but no vascular injury had been detected at the time. Examination now revealed a 11 × 7 cm circumscribed, non-tender supraclavicular swelling in the right anterior triangle of the neck about 2 cm below the angle of the mandible. The swelling was firm, not reducible and pulsatile. Bruit could be heard over the swelling. Distal pulses were normal. Computed tomography (CT) scan revealed a contrast-enhancing mass in the anterior part of the neck with a well-defined enhanced capsule. The lesion was found to be filled with isodense soft tissue. The contents of the carotid sheath, larynx, thyroid gland and trachea were displaced towards the left side (Figure 1). Innominate and selective right subclavian artery angi-

ography showed a pseudoaneurysm of the first part of the subclavian artery. The pseudoaneurysm had a wide neck and a small lumen (Figure 2). Evacuation and endoaneurysmorrhaphy with excision of the sac was performed through a cervical incision, extending to resect the medial one third of the clavicle. Since the aneurysm had a wide neck, the lateral limit of the sac could not be secured and a subclavian-axillary artery bypass was carried out using 8 mm PTFE (Gore Tex) graft. Post-operative recovery was uneventful. A post-operative angiogram was performed at two months (Figure 3) and the patient was followed up regularly. The specimen was subjected to histopathological examination and was reported as a 'pseudoaneurysm'. A

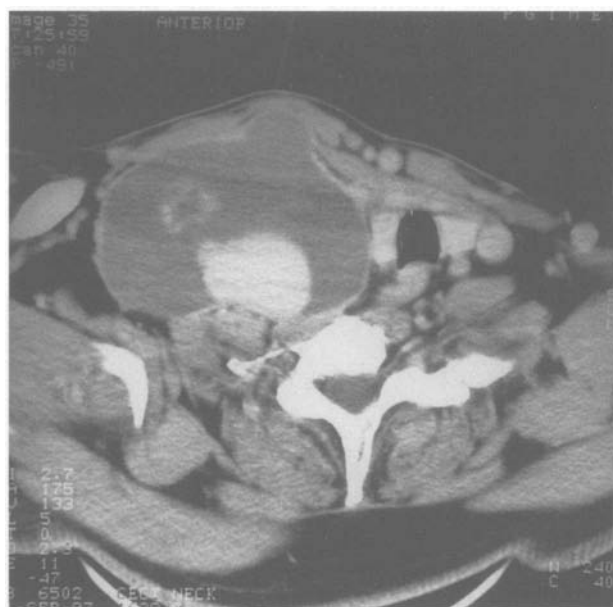


FIG. 1

CT scan showing contrast-enhancing mass in the neck.

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FIG. 2

Angiography showing pseudoaneurysm of the first part of the subclavian artery.

section from the sac consisted of fibrocollagenous tissue with a focus of foreign body giant cell reaction and another focus of a nonspecific inflammatory reaction. The cavity was found to contain organizing thrombus.

Discussion

The incidence of isolated subclavian artery injury is very low. Reviewing trauma admissions of 10 years, Steven *et al.* (1994) could find only three cases of isolated subclavian artery injury. Subclavian vascular injury was found to be only 0.2 per cent of all trauma admissions which included both blunt and penetrating injuries. Blunt trauma is less common than penetrating trauma and predominantly occurs from high speed motor vehicle accidents causing a direct injury or the shearing effect of deceleration forces.

Traumatic aneurysm usually presents as a pulsatile mass and on auscultation reveals a bruit. However, absence of pulsations and bruit does not rule out aneurysm. Failure to recognize a subclavian artery injury early enough may result in development of traumatic false aneurysm as in this patient. The development of pseudoaneurysm following trauma has also been reported by Olinde (1989) and



FIG. 3

Post-operative angiography of the same patient.

Myers *et al.* (1991). Only one case that is similar to that of ours has been reported which developed a late expanding pseudoaneurysm of the subclavian artery following blunt trauma.

Angiography is a simple and the most reliable investigation. The risks of angiography are exceedingly low and the benefits of accurate anatomical delineation of injury are extremely high. It is most important because the ultimate outcome in patients with an undetected injury can be catastrophic and unsuspected arterial injuries can be present even in the absence of any physical findings. For penetrating injuries angiography should be done in all cases but for blunt injuries angiography should be reserved for cases with associated rib fracture particularly first rib and brachial plexus injury.

Detailed pre-operative investigations are essential for the anatomical localization of injury which is of help in proper planning of the operative approach. Most of the vascular injuries in the neck are managed by median sternotomy except those of the left subclavian artery for which left thoracotomy is preferred (Richardson and Flint, 1982). In our case most of the mass presented in the neck, so a cervical incision was made with excision of the medial one third of the clavicle.

The repair depends upon the extent of injury. The majority of injuries can be repaired by end to end anastomosis but in our case the aneurysm had a wide neck with friable walls. So, a prosthetic graft was used. There is a risk of graft sepsis when prosthetic grafts are used in a contaminated field but in cases with blunt trauma the risk of sepsis is very small. In cases with infection, an internal jugular vein of adequate size and length is usually preferred for interposition repair. Saphenous venous grafts are rarely preferred these days.

Ancillary operative measures include the use of heparin, an in-dwelling carotid shunt or cardiopulmonary bypass. We used heparin in our patient without any untoward sequelae.

Recent advances in interventional radiology may provide an alternative to standard approaches. Scalea and Selafani (1991) advocated the use of angiographically placed balloon catheters for vascular control. This can be of help when using the supraclavicular approach for the repair of vessels and can obviate the need for sternotomy or thoracotomy for proximal vascular control.

Subclavian artery injuries remain a difficult management challenge. Morbidity and mortality remain high because of the unknown natural history of asymptomatic aneurysms.

However, with atypical presentation as in this case pseudoaneurysm of the subclavian artery should always be kept in mind as a rare cause of a vascular mass in the neck. Evacuation with reconstruction is the recommended treatment of choice for all diagnosed cases of pseudoaneurysms.

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