



Successful Revascularization of Left Traumatic Subclavian Artery Transection from Contralateral Thoracoacromial Artery

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Management of polytrauma in patients with associated traumatic limb vascular injury represents a major challenge, especially in the presence of vascular injury. Subjecting a patient to limb reperfusion surgery is against the concept of damage control orthopaedics. Life before limb is a common principle used in managing such cases. The authors describe a case of successful immediate revascularization of left subclavian artery from a branch of contralateral thoracoacromial artery, using a reverse saphenous vein graft in a polytrauma patient.

A 21-year-old gentleman with no medical illness was involved in a high-velocity road traffic accident and sustained a left traumatic subclavian artery cut. He underwent exploration after 20 hours due to the delay in transferring him to a tertiary center. Intraoperative findings revealed a complete avulsion of the left brachial plexus and a total left subclavian artery transection over the 2nd part (→ **Fig. 1**). The proximal stump had retracted deep under the 1st rib. No active bleeding was seen; hence, no further manipulation of the vessel was done; the area was packed with a hemostatic Gel Foam. A 30 cm great saphenous vein graft was harvested from the right lower limb and used for revascularization of the left subclavian artery. A right infraclavicular incision was made, and right subclavian artery with its branches isolated to be used as a donor artery. A subcutaneous pocket was created by blunt dissection to allow the vein graft to travel across the chest wall, and revascularization of the left subclavian artery was performed (→ **Fig. 2**).

The aims of management in the case of polytrauma associated with traumatic limb vascular injury are rapid,

accurate initial assessment, early and vigorous resuscitation, vascular control, and provisional stabilization of the fracture with external fixator to improve survival rate. Subclavian artery exploration and repair is indicated for all serious blunt subclavian artery trauma, except in very selective cases, such as artery injury with minimal, nonocclusive intimal dissection.¹ Exploration of subclavian artery is indicated in active hemorrhage, expanding hematoma, hand ischaemia and open injuries, providing that there is no indication of distal limb ischemia. Due to the rich collateral blood supply around the shoulder girdle, this is often possible.² The time-honored concepts of open arterial injury repair consist of acquiring proximal and distal vascular control, followed by reestablishing distal circulation through primary repair or graft placement restoring. This can pose a significant surgical challenge due to the vessels' position at the thoracic outlet, which penetrates the clavicle and chest wall muscles as well as the close proximity of other vital neighboring structures such as the brachial plexus, thoracic duct, phrenic and recurring laryngeal nerves, adjacent arteries and veins.³ In this case, proximal stump of left subclavian artery retracted deep to 1st rib (→ **Fig. 3**), causing total ischemia of the whole arm which required cardiothoracic expertise that would have prolonged the operation duration. The management of polytrauma patients with traumatic limb vascular injury are a diagnostic and therapeutic challenge to the trauma team, requiring a multidisciplinary approach. Subclavian artery bypass using vein graft from contralateral subclavian artery branch is a good option in managing polytrauma

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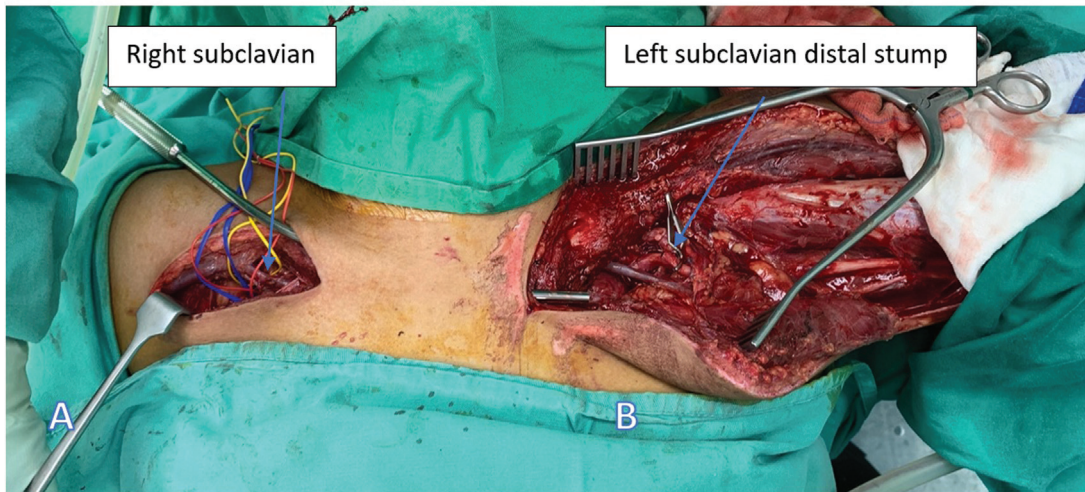


Fig. 1 (A) Right subclavian artery and its branches identified. (B) Left subclavian artery distal stump that was revascularised with reverse GSV.

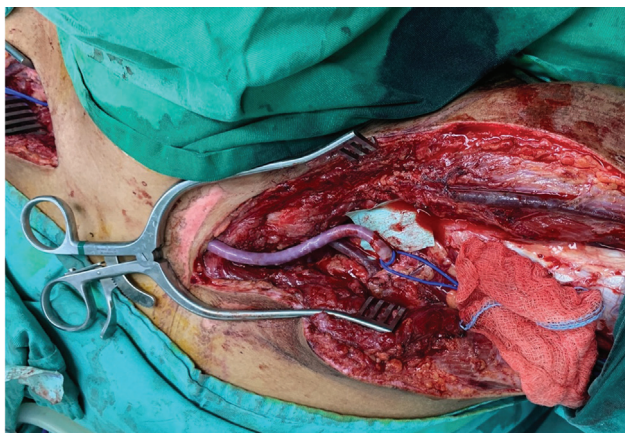


Fig. 2 Post revascularisation with autograft.

patients with compromised circulation to upper limb, in order to increase the chances of limb salvage.

Consent

Consent was obtained by all participants in this study.

Conflicts of Interest

None declared.

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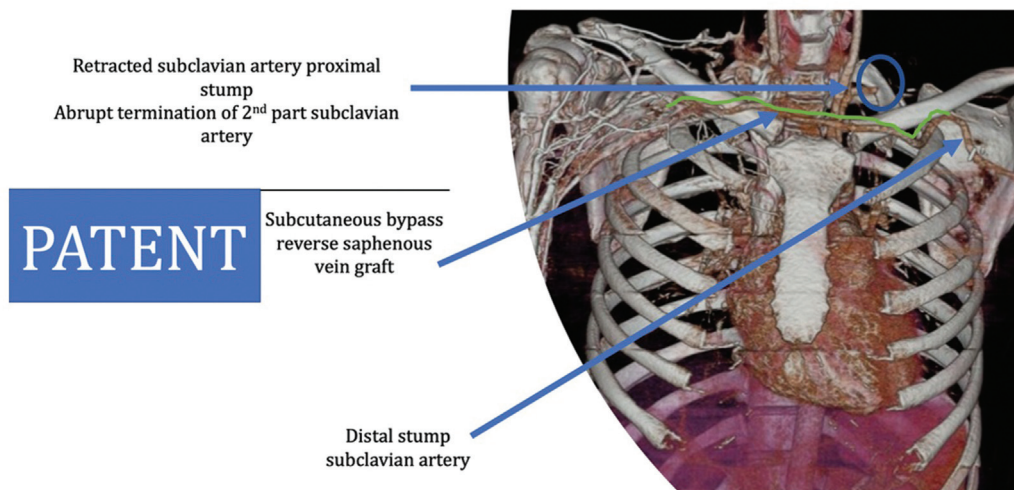


Fig. 3 CT scan with 3D reconstruction showing a patent bypass graft and the retracted proximal stump of left subclavian artery.