



A CASE SERIES OF VENOUS ANASTOMOSIS TO INTERNAL JUGULAR VEIN-A SAFE AND RELIABLE TECHNIQUE FOR MICROVASCULAR FREE FLAP RECONSTRUCTION IN HEAD & NECK MALIGNANCY.

Surgery

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KEYWORDS

INTRODUCTION

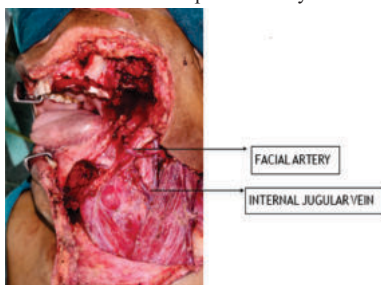
Microsurgery has revolutionised the art of head and neck tumor extirpation and reconstruction. With the ability to replace tissue with like tissue, the reconstructive surgeon can maintain function and form. With recent advances in microsurgery, free-flap reconstruction has become the first-line treatment for head and neck reconstruction because it can improve both functional and cosmetic aspects using tissues from different sites with features similar to those of the defect site. The flap survival rate of head and neck reconstruction using free flaps is reported to be approximately 95%–98% [1,2]

Successful venous anastomosis plays a major role in microvascular reconstruction of the head and neck as flap failure is mostly attributed to venous thrombosis [3]. An anastomosis to internal jugular vein (IJV) serves several benefits such as constant anatomy, large-caliber venous outflow, provision of accommodating multiple anastomoses, suitable match for any size and length of flap vein(s), and availability after neck dissection in redo cases. Improved flap survival and reduced venous thrombosis have been reported with the ES anastomosis to IJV in several studies. [4,5,6].

Here we present our experience with internal jugular vein for venous anastomosis in head and neck malignancy reconstructions over the past 2 years in Department of Head & Neck cancer at a Tertiary institute.

MATERIALS AND METHODS

This retrospective study includes all patients reconstructed with free flaps by single Plastic surgeon for head and neck malignancies using IJV for venous anastomosis in department of head & neck cancer at Tertiary Cancer institutes between 2023 to 2025. The preferential (ES) venous anastomosis was done to an IJV stump on either side of the neck, whenever feasible or opposite side in vessel depleted neck. The arterial anastomosis was preferably made with the facial artery, superior thyroid artery, external carotid artery stump. The oncosurgical clearance and neck dissection were performed by the oncosurgeons.



The facial artery and IJV on one side have been preserved (Fig. 1). Radial forearm flap (RFF), Osteocutaneous fibula flap or Anterolateral thigh (ALT) flap, were used for reconstruction according to the size of the defect and component of tissue loss. Both Arterial & venous anastomosis was performed on ipsilateral side but in recurrent tumour opposite side anastomosis was done. All the anastomoses were performed under 4.5X loupe magnification.

After excision of tumour, defect was assessed and suitable flap was selected and raised. The flap was transferred to the defect. The flap vessels were oriented inline with donor vessels without any tension or stretch. The neck vessels were prepared on the selected side for anastomosis. The arterial anas- tomosis was completed with 8–0 Ethilon interrupted sutures. For ve- nous anastomosis , site of the IJV was selected according to available length of the venous pedicle. A long curved bull dog clamp was applied along the chosen IJV site . A transverse venotomy was made on the IJV to match the diameter of the flap vein .An End to Side anas- tomosis was then performed from the posterior wall to the anterior wall with the prior placement of corner sutures using interrupted ethilon 8-0 suture. Similarly flap second vein anastomosed with IJV in similar fashion(fig 2,3) .In cases of recurrent malignancy with prior history of radiation, flap vessel was anastomosed to opposite side with venous anastomosis done to IJV in similar manner(fig 4).In some cas- es ,where where vein length was inadequate,IJV was superiorly ligat- ed and end to end anastomosis was done.After completion of both anastomoses, the arterial anastomosis, venous anastomosis on the IJV, flap bleed was assessed. The flap inset was completed and the neck wound was closed over a suction drain. The flap was monitored for any vascular thrombosis or hematoma for 5 days in the hospital.

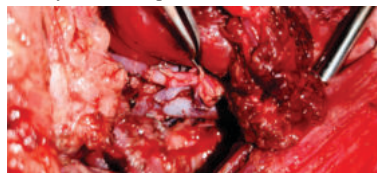


Fig 2-Both Flap Vein End To Side Anastomosis With IJV



Fig3- End To Side Ve- Nous Anasto- Mosis With IJV

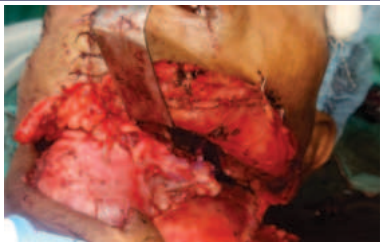


Fig 4- Flap Vessel Anastomosis To Left Side In Case Of Recurrent Malignancy.

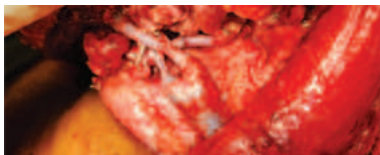


Fig 5- End To End Venous Anastomosis With IJV.

Results A total of 53 free flaps including 26 RFFs, 15 OCFs, and 12 ALT flaps were used for reconstruction in head & neck oncology department. 14 females and 39 males were operated with free flap reconstruction. Dual venous anastomosis with IJV was done in all cases. For 3 recurrent malignancy, anastomosis was performed on the opposite side. No flap failure due to venous thrombosis was seen. In 3 cases where anastomosis was done to opposite side, no flap failure was seen. During this period two flap failure was seen both due to arterial thrombosis. Two patients developed neck hematoma but was not from venous anastomosis site. It was evacuated without any flap compromise. Flap survival rate was 51/53 (96.94%)

DISCUSSION

- Flap failure after routine microvascular oncosurgical head and neck reconstructions is mainly attributed to venous failure. A range of choices for venous anastomosis including external jugular vein (EJV), anterior jugular vein, transverse cervical vein, and branches of the IJV such as the anterior and common facial vein, lingual vein, and superior thyroid vein remain available for an EE anastomosis [7]. According to availability, superficial location, familiarity with the anatomy, and surgeons' preferences, an EE anastomosis has been practiced widely for head and neck reconstruction. Size mismatch between the flap and recipient veins can be a major risk factor for postoperative thrombosis [8].

The reliability of end-to-side venous anastomosis to larger veins has been fully established in the past decades [9]; in fact, the use of end-to-side anastomosis to the internal jugular vein is now a mainstay in head and neck reconstruction in most institutions [10,11,12]. The unavailability of the IJV within the operative field is very rare in routine oncosurgical head and neck cases.

Large caliber, constant location, availability after neck dissection, provision of multiple anastomoses, and accommodation of vascular discrepancies are major factors influencing the choice of the IJV for venous anastomosis [13, 14, 15]. Besides being subjected to negative pressure during respiration, large-caliber anastomosis and protection from traction and torsion are believed to diminish venous thrombosis and improve flap survival with the IJV compared to the EJV [16, 17, 18].

Anastomosis with the IJV saves the effort of preserving and searching for suitable vessels for anastomosis. In our study, ALT flap, Free fibula flap & Free Radial flap, venous anastomosis with IJV was done conveniently. Even in recurrent cases, anastomosis to contralateral neck was done successfully. The Flap pedicle length fell well within the location of IJV making anastomosis simple & reliable. The overlying sternocleidomastoid muscle protects the venous anastomosis from torsion or traction. Vessel diameter, discrepancies, use of vein graft, and operating microscope remain a lesser concern with our approach. Harvesting as much possible vein length, avoid posterior wall bite, collapse venotomy, wider anastomosis and two vein anastomosis prevented venous complication in our study. Due to unavailability of microscope, all the cases were performed under loupe and since the vessel diameter remains greater than 2.5 mm, which could be comfortably handled with a 4.5X magnifying loupe with placement of a 8-0 ethilon suture. The major disadvantage is time consuming and technically demanding. The procedure precludes the use of an anastomotic

coupling device and requires a meticulous, hand sewn anastomosis. From a technical point of view, the venotomy is the critical step in this procedure [19]. If the venotomy is too large, the caliber of the recipient vein becomes constricted at the anastomotic site. Care should be taken not to attenuate the recipient vein. In addition, the walls of the recipient veins are sometimes friable and easy to tear.

Delicate handling of the needle is mandatory in achieving a successful anastomosis. However, with experience in microvascular anastomosis, the above difficulties can be overcome and flap complication due to venous anastomosis can be reduced.

CONCLUSION

Use of IJV for venous anastomosis is quite reliable and simplifies microvascular anastomosis by providing a constant large caliber vein, suitable geometric location and convenience of multiple flap vein anastomosis along its length thereby reducing venous related flap complication. Vascular anastomosis for RFF, OCF, and ALT flap can be performed quite conveniently under 4.5X loupe magnification with similar results.

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