Perforator based sternocleidomastoid transposition flap for nape of neck defect: a novel option

Perfurador baseado em transposição de retalho estenocelidomastoide para defeitos da região posterior do pescoço: uma nova alternativa

DUSHYANT JAISWAL [1]
VIDISHA TULJAPURKAR [1]*
VINAYKANT SHANKHDHAR [1]
PRABHA YADAV [1]

■ **ABSTRACT**

Sternocleidomastoid musculocutaneous flaps have been described in the literature for reconstruction of oral cavity defects and treatment of Frey's syndrome. Although widely studied, it is not used routinely in head and neck reconstruction due to limitations like small size, unreliable skin paddle, contour deformity in the neck and the question of oncologic safety. We report use of perforator based musculocutaneous transposition flap for defect over nape of the neck, followed by excision of a soft tissue sarcoma. This constitutes a valid alternative to other reconstructive procedures like pedicled regional flaps or free tissue transfer in a suitable group of patients.

Keywords: Surgical flaps; Perforator flap; Reconstructive surgical procedures; Neck; Sarcoma.

■ **RESUMO**

Retalhos do músculo esternocleidomastoideo têm sido descritos na literatura para reconstrução dos defeitos da cavidade oral e tratamento da síndrome de Frey. Apesar de largamente estudado, esses retalhos não são utilizados com frequência para reconstruções na região de cabeça e pescoço devido limitações como tamanho reduzido, camadas inseguras, contorno da deformidade no pescoço e questões de segurança oncológica. Relata-se uso de perfurador baseado em transposição de retalho para defeito na região da posterior do pescoço, seguido por excisão de sarcoma de partes moles. Trata-se de alternativa válida para procedimentos de reconstrução como retalhos regionais de pedículo ou transferência de tecido livre em um grupo apropriado de pacientes.

Descritores: Retalhos Cirúrgicos, Procedimentos Cirúrgicos Reconstrutivos, Pescoço, Sarcoma.

Institution: Tata Memorial Hospital, Mumbai, Maharashtra, India.

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[1] Tata Memorial Hospital, Parel, Mumbai, Maharashtra, India.

INTRODUCTION

Sternocleidomastoid (SCM) muscle originates by two heads from the clavicle and the manubrium, it runs obliquely along the length of neck and is inserted at the mastoid tip.

Owens[1] reported the first use of a musculocutaneous flap based on SCM in 1955. After that, various other modifications and indications have been reported in the literature. The SCM flap can be used in dynamic reconstruction of the face[2], reconstruction of oral and mandibular defects[3,4], Frey's Syndrome[5] and laryngotracheal reconstruction[6].

Although these versatile indications, SCM flap is not widely popular due to pitfalls such as unreliable segmental blood supply, small island skin paddle, and deformity in the neck.

We report an uncommon indication for the use of a perforator based on SCM flap with use of skin paddle as a transposition flap instead of an island flap, and identification and preservation of its blood supply using hand held Doppler.

METHODS

A 22-year-old man with planning for wide excision of the scar & residual tumor over the nape of neck following the removal of an alveolar soft tissue sarcoma, with concomitant insertion of intraoperative brachytherapy implants.

A wide local excision of the scar over right side on nape of neck with adequate margins and base was done with patient in left lateral position and under general anaesthesia.

Excision resulted in a 10 x 4 cm horizontally oriented elliptical defect over the nape of neck (Figure 1).

A cutaneous perforator was located using a hand held Doppler and marked near the region of the mastoid tip adjacent to the defect with patient in left lateral position. A superiorly based 10 x 4 cm transposition flap was marked over the right SCM muscle (Figure 2).

The reach of the transposition flap was confirmed, and a superiorly based flap was elevated by taking a part of the muscle along with the overlying skin and subcutaneous tissue (Figure 3).

Brachytherapy implant insertion was done in the defect bed of the. The SCM flap was transposed into the defect covering the implants, and inserting was completed (Figure 4). The defect at the donor site was closed to primary suture.

Figure 1. The defect after the excision of soft tissue sarcoma (10x4 cm defect).

Figure 2. Marking of the sternocleidomastoid transposition flap.

Figure 3. Insertion of brachytherapy implants with sternocleidomastoid transposition flap.

Figure 4. Completed flap insertion.

Figure 5. Postbrachytherapy implant and suture removal.

RESULTS

Postoperative Brachytherapy began on the third day and patient received radiotherapy to the dose of 36 Gy in 9 fractions.

We did not observe during radiation flap necrosis, dehiscence or other complications such as seroma, infection or hematoma.

Implant and suture removal was done uneventfully after completion of brachytherapy.

The patient had an excellent functional and aesthetical outcome at the end of treatment (Figure 5).

DISCUSSION

A number of applications of SCM muscle flap have been reported in the literature in past, but recent advances in the head and neck region reconstruction, mainly free tissue transfer has never gained popularity.

Certain pitfalls of SCM flap are main responsible for its unpopularity.

SCM muscle has a type II vascular supply[7], with one dominant pedicle arising from occipital artery, and 3 minor pedicles from a branch of posterior auricular A, superior thyroid A and transverse cervical A. The vascular supply passes through the overlying skin after penetrating the platysma muscle.

If it is superiorly or inferiorly based, the viability of the skin paddle is unreliable. Also, questions have been raised regarding the use of SCM for oncologic safety.

In this report, reconstruction enabled a vascularized tissue cover for brachytherapy with acceptable aesthetic result.

Other options for reconstruction entail the use of regional flap such as trapezius flap which would have the disadvantage of unfavorable adjustment, poor donor site profile, and Latissimus dorsi flap that could be too bulky for the defect or free tissue transfer.

While harvesting the SCM transposition flap, viability of the overlying skin paddle was confirmed by locate of cutaneous perforator using a hand held Doppler. In addition, part of the muscle removed from skin paddle provided the bulk for depth of the defect.

The donor site is seen near primary suture with no resultant morbidity.

In the postoperative period, patient tolerated well radiation without any related complications to flap, with acceptable aesthetical result.

The use of Doppler technique ensures a reliable blood supply to the skin paddle by the identification of perforator prior to flap design, which makes the skin paddle more reliable.

CONCLUSION

The use of the SCM transposition flap in our report avoided more complex reconstruction, therefore, reducing overall surgical time and morbidity.

To understand the regional blood supply, and designing local flap by locate the skin perforators can offer various new options for reconstruction in less complex procedures.

COLLABORATIONS

DJ Conception and design of the study; final approval of the manuscript; critical review of its contents.

VT Analysis and/or interpretation of data; conception and design of the study; writing the manuscript or critical review of its contents.

VS Final approval of the manuscript; writing the manuscript or critical review of its contents.

PY Final approval of the manuscript; writing the manuscript or critical review of its contents.

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***Corresponding author:** **Vidisha Tuljapurkar**
Parel, Mumbai, Maharashtra, India
Zip Code 400012
E-mail: vidishavt@yahoo.com