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Short Communication

The neurotised estlander flap for lip reconstruction [☆]

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ARTICLE INFO

Article history:

Received 17 November 2020

Accepted 21 November 2020

Available online 1 December 2020

Keywords:

Lip reconstruction

Estlander

Neurotised

Lip-switch

ABSTRACT

The Estlander flap is an axial-pattern, lip-switch technique used to reconstruct lip defects that include the oral commissure. We describe a neurotised modification that may confer functional advantages by preserving sensation and helping to maintain oral competence. This is achieved by preservation of the mental nerve branches to the lip and facial nerve branches to the orbicularis oris muscle in the flap.

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Lips are a crucial aesthetic area and anatomical deficits are easily seen. That said, function is even more important, especially articulation, oral competence and an adequate aperture. Therefore, reconstruction of the lip is a significant challenge when trying to restore any defect with cosmetically similar, functional and sensate tissue.

In this article, we describe a modification of the Estlander flap, first described in 1872. The flap is an axial-pattern, lip-switch technique supplied by either the inferior or superior labial artery which can be used to reconstruct defects of the upper lip or lower lip.¹ It can be used to reconstruct defects involving one to two thirds of the length of the lip, especially those involving the oral commissure. However, the original description of the Estlander flap suggests that this flap is insensate and (subsequently) there has been little mention of the option for preserving the sensory or motor components

[☆] Work has not been presented elsewhere.

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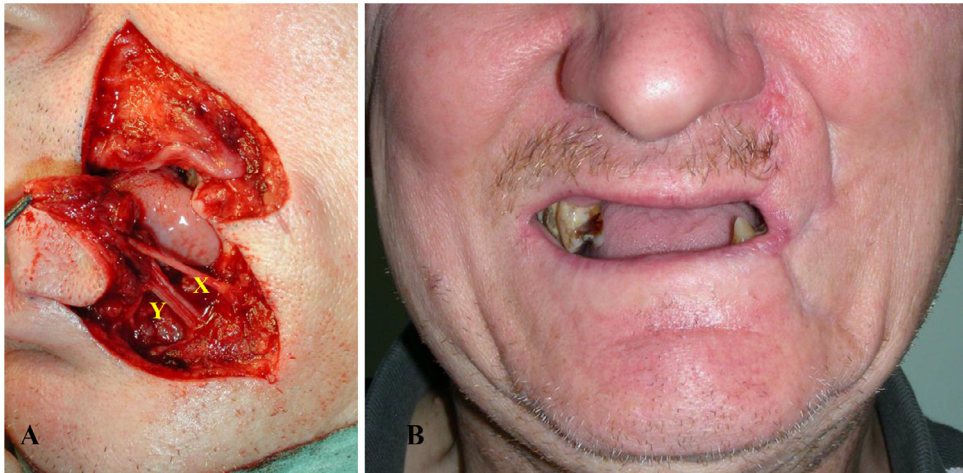


Figure 1. (A) Intra-operative rotation of Estlander flap: X = motor branch of facial nerve to orbicularis oris and Y = branch of mental nerve (B) Post-operative follow-up at 2 years.

of the flap.^{2,3} If these elements could be preserved, there would be an immediate functional advantage.

The Estlander flap is normally designed as a triangle with its base corresponding to half the width of the defect (measured along the line of the vermillion) on the opposite lip, whilst the height of the donor tissue must equal the defect to ensure adequate restoration of the anatomy. A through-and-through incision is carried out at the lateral limb of the donor triangle, through the red lip of the oral commissure where the lateral aspect of the ipsilateral labial artery and facial nerve branches are located. The medial limb is also a through-and-through incision, which spares the oral margin of the red lip, allowing for a thin pedicle that helps to restore the shape of the neocommissure.^{4,5} Traditionally, most surgeons carry out a through-and-through incision of the lateral limb tissues. However, we have modified the standard technique. Instead of cutting all the tissues on this side of the flap, we preserve the facial nerve branches to the orbicularis oris muscle as well as the mental nerve branches supplying sensation to the flap tissue (Figure 1A). To ensure that these structures have been preserved, we routinely use a nerve stimulator to identify (and thus protect) the motor and sensory innervation described above (Supplementary Video 1). To provide sufficient mobility to allow the flap to be transposed into its recipient site, we use careful blunt dissection through the muscle fibres of orbicularis to free up sufficient length for both motor and sensory nerves to stretch to the upper lip (or lower lip if done in reverse).

We present a clinical case of a 71-year-old lady who presented with a biopsy-proven basal cell carcinoma (BCC) of the right cheek (Figure 2). The BCC was excised with a 10 mm margin, resulting in a loss of approximately 40% of the length of the right upper lip including the oral commissure. An Estlander flap was used to reconstruct the lip defect and this was combined with a radial forearm free flap to reconstruct the maxilla and a pedicled forehead flap to reconstruct the right side of the nose.

Once healed, a secondary commissuroplasty can be carried out to provide a sharper, more symmetric oral commissure - but this is seldom necessary. The patient in Figure 2 had a 2 point discrimination of 15 mm at two-weeks post-op and reported that touching the flap already felt like you were touching her upper lip. Figure 1B illustrates a previous Estlander flap at two-years follow-up, which was sensate with a reasonable functional and cosmetic outcome.

This modified technique of the Estlander lip-switch technique, represents a one-stage reconstruction of a significant upper-lip, oral-commissure defect and ensures that this cosmetically sensitive area is restored with like-for-like, neurotised and functional tissue.

Declaration of Competing Interest

None declared

Funding

None

Ethical approval

Not required

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.jpra.2020.11.011](https://doi.org/10.1016/j.jpra.2020.11.011).

References

1. Estlander J. Eine Methode aus der einen Lippe Substanzverluste der anderen zu ersetzen. *Arch Klin Chir.* 1872;14:622.
2. Neligan PC. Volume three: craniofacial, head and neck surgery. *Plastic Surgery*. Seattle, WA, USA: Elsevier Saunders; 2013:259–261.
3. Yamauchi M, Yotsuyanagi T, Ezoe K, Saito T, Yokoi K, Urushidate S. Estlander flap combined with an extended upper lip flap technique for large defects of lower lip with oral commissure. *J Plast Reconstr Aesthetic Surg.* 2009;62(8):997–1003.
4. Eggerstedt M, Smith RM, Revenaugh PC. Estlander flap for lip reconstruction: estlander flap. *Oper Tech Otolaryngol - Head Neck Surg.* 2020;31(1):10–12.
5. Quick B. the estlander-abbe operation. *Aust N Z J Surg.* 1946;16:142–148.