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Correspondence and Communications

Challenges in lower face soft tissue reconstruction: The value of the historical bipedicled scalp flap procedure☆

Dear Sir,

Lower lip and chin reconstructions are challenging, since satisfactory aesthetic and function outcomes in the mouth region are difficult to achieve[1]. Although various techniques for lower lip and chin reconstruction have been described, some cannot be applied in patients with disease recurrence, the failure of previous procedures, or a history of radiotherapy. These particularly unfavorable conditions rule out the use of an additional free flap, due to the lack of donor sites or recipient vessels. The pedicled flaps (deltopectoral, latissimus dorsi, and pectoralis major flaps) used as a second-line procedures are associated with a retractile healing process, resulting in cervical flexion deformity and worsened lip incompetence. In situations lacking a conventional solution, the historical bipedicled scalp flap[2] may therefore be a valuable option.

Historical description

In October 1918, the famous French surgeon Léon Dufourmentel (1884–1957) described a four-step procedure[2] for treating chin defects. The bases of the scalp flap's two pedicles are centered on superficial temporal vessels. The flap is easily harvested in the subgaleal plane as a band of hair-bearing skin from the scalp, rotated 180° to reach the chin, and then (as long as no tension is present) sutured (Figure 1). Seventeen days later, the two pedicles are released, and excess tissue is repositioning at the donor site. Four weeks later, the flap's shape can be adjusted. Four weeks after that, a secondary osteoperiosteal chin graft (using Delageniere's procedure) is performed.

Modern application of the bipedicled scalp flap procedure

Between 2015 and 2019, five patients underwent soft tissue reconstruction of the lower third of the face with a bipedicled scalp flap (Supplemental Material 1). Bone reconstruction had been achieved previously, using free flaps. Although we essentially followed Dufourmentel's procedure, we introduced some notable vascular safety improvements on the basis of our current knowledge of the region's anatomy. Firstly, the patency of the superficial temporal vessels was checked prior to surgery, using Doppler ultrasound. The flap was delayed: firstly harvested and replaced to it donor site for two weeks before mobilization to the chin area. After the transfer the pedicles were then tubed to prevent desiccation or infection.

This was followed by prophylactic treatment with a platelet aggregation inhibitor (DL-lysine acetylsalicylate, 75 mg) and an anticoagulant (dalteparin sodium, 2500 IU/0.2 ml). The pedicles were typically released 3 weeks later on one side and an additional 3 weeks later on the other. From postoperative day 10 onwards, the surgeon performed daily clamp tests on the pedicle. Depending on the flap's vitality, the clamping time was increased by 5 min per day up to a maximum of 60 min. Once this duration had been reached, the pedicle was released. Lastly, the donor site was closed with a skin graft or skin expanders and a local flap.

Discussion

The bipedicled scalp flap was first described at the end of the First World War and was widely used until the 1950s. According to the literature data[3] and our own experience, the bipedicled scalp flap is a reliable surgical option. However, this flap has rarely been used for lower face reconstruction - making it difficult to estimate the number of patients having undergone this procedure.

Historically, the bipedicled scalp flap was superseded by one-step procedures involving pedicled flaps (submental flaps, deltopectoral flaps, or pectoralis major flaps) or micro-anastomosed flaps[4] that made composite tissue transfers possible and provided greater freedom of positioning.

We converted this highly reliable historical technique into a "salvage flap" technique for patients lacking other treatment options. The bipedicled scalp flap's dimensions enable reconstruction of a lower labial strap by upward traction; this contrasts with the cervicothoracic pedicle

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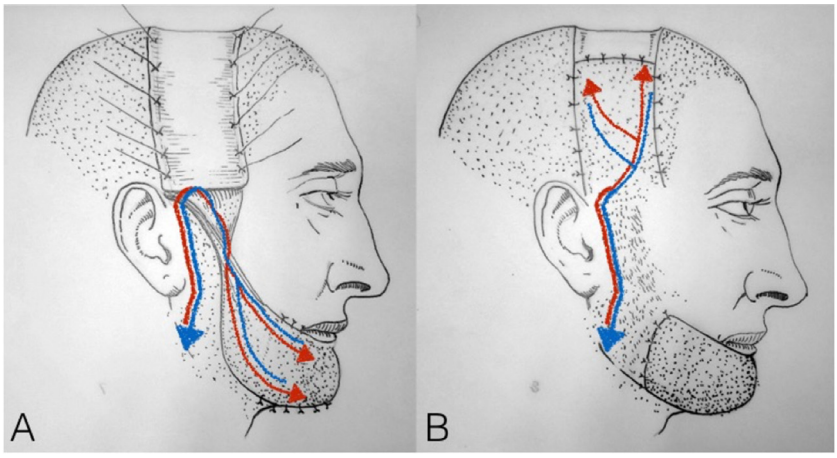

Figure 1 A drawing of the bipedicled scalp flap procedure after positioning in the chin region (A) and after weaning of the pedicles (B). The temporal arteries and veins are shown in red and in blue, respectively.

flap, which accentuates downward lip retraction and cervical flexion deformity.

In male patients, the bipedicled scalp flap enables hair-bearing, resurfaced reconstruction of the lower face and chin[5]; this technique results in a better esthetic outcome by masking imperfections and thus avoiding the "patchwork" appearance that follows conventional reconstruction with a skin paddle.

Conclusion

Historically, the bipedicled scalp flap was specifically reserved for rare, complex cases of lower face reconstructions (e.g. in patients with few available neck vessels after having undergone a large number of operations). The bipedicled scalp flap is a reliable treatment option, with good esthetic and functional outcomes. Transposition of the scalp restores the lip-chin strap, resurfaces the cheeks, and thus hides any scars from previous operations.

Declaration of Competing Interest

The authors disclose no conflicts of interest with regard to the present work.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.bjps.2020.08.107.

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M. Olivetto, J. Bettoni
Department of Maxillofacial Surgery, Amiens-Picardy University Medical Center, Avenue René Laennec, F-80000 Amiens, France

E-mail address: matthieuolivetto@live.fr

J. Duisit
Department of Plastic and Reconstructive Surgery, Cliniques Universitaires Saint-Luc, Avenue Hippocrate 10, B-1200 Brussels, Belgium

S. Dakpé, S. Testelin
Department of Maxillofacial Surgery, Amiens-Picardy University Medical Center, Avenue René Laennec, F-80000 Amiens, France

J. Bouaoud
Department of Maxillofacial Surgery and Stomatology, Pitié-Salpêtrière Hospital, Pierre et Marie Curie University Paris 6, Sorbonne Paris Cite University, AP-HP, Paris F-75013, France

B. Devauchelle
Department of Maxillofacial Surgery, Amiens-Picardy University Medical Center, Avenue René Laennec, F-80000 Amiens, France

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