OPEN

PRS GLOBAL OPEN VIDEO

Reconstructive

High-Tension Closure of the Submental Flap Donor Site: Video and Technical Considerations

Calum S. Honeyman, MBChB, MRCS*; Urška Čebron, MBBS†; Daniel Bradley, BMBS, MRCS‡; Vinod Patel, MOralSurg, FDSRCS§; Mekonen Eschete, MD, PhD¶; Mark McGurk, MD, FDSRCS‖; Baptiste Bertrand, MD, PhD**; Dominique Martin, MD, PhD††

HIGH-TENSION CLOSURE OF THE SUBMENTAL FLAP DONOR SITE: VIDEO AND TECHNICAL CONSIDERATIONS

The senior author of this article (DM) described the submental artery island flap in 1990.[1] The submental flap offers a reliable, pedicled option for head and neck reconstruction with excellent color and texture match for facial skin. In addition, the flap has a well-concealed donor site in the neck. This flap has proved invaluable on short-term reconstructive missions to resource-limited settings, in the absence of microsurgical capabilities.

In 2019, Martin and colleagues reported only 1 case of donor site dehiscence in a large series of 311 submental flaps performed in France and Africa.[2] This complication was attributed to a lack of high-tension sutures between the dermis and hyoid bone. The purpose of this article and the accompanying video content is to detail a reproducible approach to the closure of the submental flap donor site. (**See Video, Supplementary Digital Content 1 [online],** which displays steps in the closure of the submental flap donor site in the neck.)

*From the *Ninewells Plastic Surgery and Burns Unit, Ninewells Hospital, Dundee, Scotland, United Kingdom; †Department of Hand, Plastic, Reconstructive and Burns Surgery, University of Tübingen, Tübingen, Germany; ‡King's College London, Faculty of Dentistry, Oral and Craniofacial Sciences, Guy's Tower, Guy's Hospital, London, United Kingdom; §Oral Surgery Department, Guys Dental Institute, Guys & St Thomas NHS Foundation Trust, London, United Kingdom; ¶Department of Surgery, School of Medicine, College of Health Sciences Addis Ababa University, Addis Ababa, Ethiopia; ‖Department of Head and Neck Surgery, University College London Hospital, London, United Kingdom; **Department of Plastic and Reconstructive Surgery, Hôpital de la Conception, Assistance Publique–Hôpitaux de Marseille, Marseille, France; and ††Private Practice, Marseille, France.*

Received for publication August 17, 2020; accepted October 1, 2020.

Plast Reconstr Surg Glob Open 2020;8:e3271; doi: 10.1097/GOX.0000000000003271; Published online 17 December 2020.

TECHNIQUE

Step 1: Preoperative Markings and "Pinch Test"

Before raising of the submental flap, it is always advisable to flex the patient's chin forward and perform a "pinch test" to ensure that primary closure of the marked donor site will be possible. If there is any doubt regarding closure, a smaller flap can be marked. Safe donor site closure should be possible with flap dimensions up to a maximum of 22 × 9 cm.

Step 2: Creation of a Subplatysmal Tunnel Caudally

Ensure meticulous hemostasis is achieved before attempting closure of the submental donor site in the neck. At this stage, flexion of the head will make donor site closure easier. Mayo scissors are directed caudally, in a subplatysmal plane, toward the sternal notch. The scissors are spread carefully, in a perpendicular orientation to the strap muscles, creating a 3–5 cm tunnel. Using a good light source, it is important to re-assess hemostasis after this step to ensure no veins have been damaged during the creation of the tunnel.

Step 3: Anchoring the Cervical Skin at the Level of the Sternal Notch to Facilitate Advancement

A 1-0 or 2-0 absorbable suture, on a large cutting needle, is passed through the new tunnel from cranial to caudal. An assistant can use a Langenbeck retractor to improve exposure during this step. The needle should emerge through the skin just above the level of the sternal notch, in the midline. The needle is then reversed, aimed cranially, and passed back along the tunnel to emerge in the donor site wound. Again, a retractor can be used to tent the tunnel, facilitating passage of the needle cranially.

Step 4: Anchoring Suture to the Periosteum of Hyoid Bone

A robust transverse suture of the periosteum of the hyoid bone is taken using the same 1-0 or 2-0 suture from step 3. A knot is tied that will advance the cervical skin up to the level of the hyoid bone. We prefer to use a slip knot

Disclosure: *The authors have no financial interest to declare in relation to the content of this article. No funding has been received for this study.*

Related Digital Media are available in the full-text version of the article on www.PRSGlobalOpen.com.

for this step because it is easy to perform and maintain constant tension. The slip knot and cervical advancement is demonstrated in the accompanying supplementary video content. (**See Video, Supplementary Digital Content 1 [online],** which displays steps in the closure of the submental flap donor site in the neck.)

Step 5: Anchoring Sutures between the Cervical Skin and the Subcutaneous Tissue Inferior to the Mandible

By this stage the majority of the tension has been taken up with robust sutures between the cervical skin and the periosteum of the hyoid bone. Using a separate 1-0 or 2-0 absorbable suture, large deep dermal bites are taken from the cervical skin, now anchored to the hyoid bone, and then in turn from the subcutaneous tissue and periosteum inferior to the mandible, in the midline. In situations where insufficient subcutaneous tissue is present in the mental area, 2 holes are drilled through the mandible and the suture ends passed through and tied to secure to the cervical skin.

Step 6: Drain Insertion and Final 2-layer Skin Closure

A drain is inserted along the length of the incision, and wound closure is completed in a standard fashion using interrupted, sub-dermal 3-0 absorbable sutures and a running 4-0 nylon for the skin.

Calum S. Honeyman, MBChB, BSc (Hons), MRCS
Plastic Surgery and Burns Unit
Ninewells Hospital
James Arrott Drive, Dundee
Scotland, United Kingdom
E-mail: c.s.honeyman@gmail.com

REFERENCES

1. Martin D, Baudet J, Mondie JM, et al. [The submental island skin flap. A surgical protocol. Prospects of use]. *Ann Chir Plast Esthet.* 1990;35:480–484.
2. Bertrand B, Honeyman CS, Emparanza A, et al. Twenty-five years of experience with the submental flap in facial reconstruction: evolution and technical refinements following 311 cases in Europe and Africa. *Plast Reconstr Surg.* 2019;143:1747–17581.