Reconstruction of a Submandibular Soft Tissue Defect with a Temporoparietal Fasciocutaneous Flap - A Case Report

Naren Shetty, Samir Dashrath Khaire[1], Shameeka Thopte[2], Shams Ul Nisa[2], S. Unnikrishnan[3], Kavita Wadde[1]

Department of Plastic Surgery, St John's Medical College Hospital, Bengaluru, Karnataka, [1]Department of Oral and Maxillofacial Surgery, Government Dental College and Hospital, Mumbai, [2]Department of Oral Medicine and Radiology, Bharati Vidyapeeth (Deemed to be University) Dental College and Hospital, Pune, Maharashtra, [3]Department of Plastic Surgery, Sree Gokulam Medical College, Thiruvananthapuram, Kerala, India

Abstract

Rationale: Reconstruction of soft tissue defects in the facial region have always been challenging. Appropriate selection of flaps will result in minimal morbidity and restore the tissue form without compromising function. **Patient Concerns:** During reconstruction in the facial region, patients desire to have minimal visible scar and functions of the jaw bone. **Diagnosis:** The article discusses a case of right space infection with soft tissue loss in the submandibular region. **Treatment:** The fascial spaces were explored and the odontogenic foci of infection were removed. The soft tissue defect in the submandibular region was resurfaced using the temporoparietal fasciocutaneous flap. **Outcomes:** The flap was well settled, and facial contours were maintained with reasonable facial symmetry. **Take-away Lessons:** Surgical skill in the management of soft tissue defects in the fascial region demands sound knowledge of the facial region, selection of the flap and meticulous execution of the surgical plan.

Keywords: Odontogenic fascial space infection, submandibular reconstruction, temporoparietal fasciocutaneous flap

Introduction

Odontogenic infections have been one of the most common diseases of human beings and an all too frequent cause of death. Localised infections may be treated simply, while severe odontogenic infections spread into the fascial spaces of the head and neck, which require surgical treatment. Improvements in surgical techniques along with antibiotic treatments have made complications extremely rare.[1]

This case report presents a case of pressure necrosis of the skin over the submandibular region due to odontogenic space collection, which was effectively resurfaced by a temporoparietal fasciocutaneous flap (TPFF).

Case Report

A 40-year-old male patient had presented with the complaint of pain and swelling on the right side of the face for eight days. Progressively the swelling increased resulting in trismus and odynophagia. Swelling on the right side of the face extended from the right zygomatic arch to the inferior border of mandible (superoinferior extent) and from the right corner of mouth to the posterior border of ramus of mandible (anteroposterior extent). The swelling was firm, tender to palpation and very tense. Skin overlying the swelling was warm and erythematous. In addition, there was noticeable swelling below the inferior border of mandible on the right side. The interincisal opening was about 10 mm. There was progressive discolouration and necrosis of the skin over the right submandibular region [Figure 1a and b]. Even though interincisal opening was restricted, a carious mandibular second molar was seen on the right side, which was tender to palpation.

Address for correspondence: Dr. Shams Ul Nisa, Department of Oral Medicine and Radiology, Bharati Vidyapeeth (Deemed to be University) Dental College and Hospital, Pune, Maharashtra, India.
E-mail: dr.shamsu6@gmail.com

Received: 28-11-2023 **Last Revised:** 20-02-2024
Accepted: 18-03-2024 **Published:** 15-04-2024

How to cite this article: Shetty N, Khaire SD, Thopte S, Nisa SU, Unnikrishnan S, Wadde K. Reconstruction of a submandibular soft tissue defect with a temporoparietal fasciocutaneous flap - A case report. Ann Maxillofac Surg 2024;14:109-11.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/aoms

DOI: 10.4103/ams.ams_227_23

A provisional diagnosis of right submandibular, submasseteric and buccal space infection along with necrosis of the overlying skin in the submandibular region was made. Radiological examination revealed periapical rarefaction associated with a carious mandibular right second molar [Figure 2].

The fascial space was drained extraorally via a submandibular incision. Parenteral medication and intravenous fluids were given to help improve the patient's general condition. Care was taken to maintain adequate hydration of the patient. After the abscess was drained and the swelling reduced, the interincisal opening improved. The odontogenic foci of infection were removed under local anaesthesia two days following the incision and drainage of the abscess. Both the procedures were not done simultaneously as the patient had trismus.

As the swelling on right side of the face and the pus discharge through the submandibular incision reduced, the wound was thoroughly debrided under local anaesthesia. Around 3–4 days following the incision and drainage of the abscess, when the necrotic tissue became defined, debridement was carried out and the wound was given periodic dressings to ensure formation of healthy granulation tissue. This allowed us to evaluate if further debridement was necessary. Following debridement, a defect of around 7 cm × 4 cm was evident in the submandibular region [Figure 3a].

The TPFF was planned to cover the defect. Under local anaesthesia, the flap was outlined and the pre-auricular incision was made to gain access to the temporoparietal fascia (TPF) [Figure 3b]. The superficial temporal artery (STA) was marked pre-operatively with a handheld Doppler, and the dissection was carried out within the subcutaneous plane from the inferior to superior direction for the ease of harvesting. Once the TPF was exposed, the STA was located and the TPF was elevated from the temporalis fascia. The plane of flap elevation was deep to the TPF. Due care was taken to prevent injury to the temporal branch of the facial nerve. Once the flap was raised, a soft tissue tunnel was created to deliver the flap to the recipient tissue bed where it was sutured with the help of vertical mattress sutures. The flap is tunnelled lateral to the zygomatic bone [Figure 3c]. The flap pivotal point was at the entry point of the vascular pedicle into the fascia, just above the zygomatic arch. The donor site was closed primarily in anatomic layers [Figure 3d and e].

During subsequent follow-ups, it was observed that the donor site scar was well masked [Figure 3f]. There was no scar alopecia. Hair growth over the flap corresponded to the beard but was more than that of the beard, so the patient had to do regular trimming. The flap was well settled, adhered to the facial contours and there was reasonable facial symmetry on frontal as well as lateral profiles [Figures 4a-c]. The patient was satisfied with the aesthetic outcome and no functional deficits were reported.

Discussion

Flaps harvested from the temporal region are increasingly used during craniomaxillofacial and skull base surgeries as well as for reconstructive surgery of the extremities.[2] Independent blood supply to the temporalis muscle and fascia permits separate utilisation of muscle or fascia in the elevation of regional flaps.[3] The temporalis myofascial flap is widely used in oncosurgeries.[4] Many factors contribute to the popularity of the temporoparietal flaps such as their rich vascularity, ample arc of rotation and the consistency in the position of the vascular pedicle. The temporal region can provide diverse tissues such as skin, fascia, muscle and calvarial bone for reconstruction.[5] TPFF has limited and specific indications for use, which include small skin defects in the beard region laterally and eyebrow reconstruction. The reason for its limited use being difficulty in closure of donor site beyond 3 cm, size and the limited areas requiring hair bearing skin, apart from scalp. Furthermore, flaps of larger size will result in unacceptable donor site alopecia. The maximum length of flap that can be reliably harvested is about 12 cm from the zygomatic arch, as beyond this point the vessels merge into the subdermal plexus of the scalp and no longer maintain axiality.

Figure 1: (a and b) The prominent swelling, reduced interincisal opening and necrosis of the skin

Figure 2: Periapical rarefaction associated with a carious mandibular right second molar

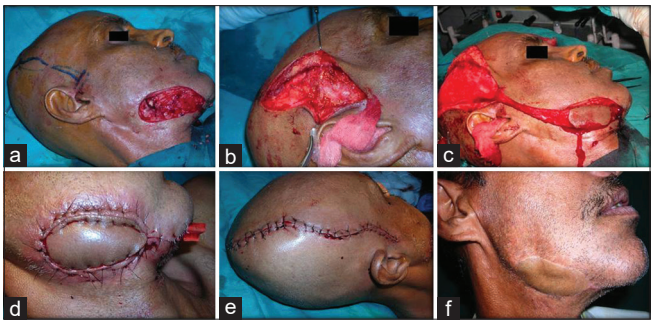

Figure 3: (a) The defect in the right submandibular region with necrosed tissue. (b) The marking for raising the temporoparietal fasciocutaneous flap (TPFF) after placing the pre-auricular incision. (c) The TPFF being tunnelled lateral to the zygomatic bone to reach the recipient site. (d and e) The suturing with primary closure of the temporal, preauricular and submandibular region. (f) The primary closure with minimal noticeable scar

Being thin, pliable and richly vascular, the temporoparietal fascial flap has been used in the management of primary microtia with a low hairline, in cases of burns involving the ears for resurfacing exposed cartilages. The TPF is firmly adherent to the subcutaneous tissue of the scalp, especially in the area of the superior temporal line where the transition to the galea occurs. Care should be taken when carrying out dissection in this region to avoid dissecting into the substance of the TPF. The loose areolar tissue deep to the TPF allows the scalp its mobility. It is an avascular plane and is therefore ideal for dissection. The auriculotemporal nerve provides nerve supply to the fascial flap. The nerve and STA are consistent in their position and thus the TPFF has the potential of being a sensate pedicled flap.[6] The temporal fascia has two laminae, superficial and deep.[7,8]

Other local flaps are available for covering defects in submandibular region, but with certain drawbacks. In using the platysma flap for submandibular defects, the risk of venous congestion is higher owing to its vertical and superficial venous drainage pattern through the facial vein, the external jugular vein and the anterior jugular vein. Hence, the flap must be cut with a wide base of implantation, avoiding some tension and twisting of the flap during the lifting and positioning in the defect area.[9]

In using a deltopectoral flap, its disadvantage seems to be the need to process the pedicle 2 or 3 weeks after the primary surgery. Furthermore, skin grafting to the donor site is usually required.[10]

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

Figure 4: (a) The well masked scar in the temporoparietal region within the hairline. (b and c) The good facial symmetry with improved interincisal opening

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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