Heterotopic ossification of the vascular pedicle of fibula causing trismus

Sir,

The fibula is the most common vascularised bone used for maxillary and mandibular reconstruction. In patients with ectodermal dysplasia, a very rare condition, the fibula can be used for alveolar reconstruction to increase the height of the bone to enable placement of implants for dental rehabilitation.[1] The distal part of the harvested fibula bone is used for reconstruction, while the proximal part is discarded by extra-periosteal dissection. However, during the fine-tuning of the osteotomy, some part of the periosteum is retained along the vascular pedicle. This vascularised periosteum attached to the vascular pedicle has osteogenic potential.[2] This heterotopic periosteal ossification is a rare but known phenomenon;[3] however, symptomatic ossification requiring surgical management is uncommon.

We report a case of anhidrotic ectodermal dysplasia, reconstructed with free fibular flap and osseointegrated implants, who developed trismus 2 years after the microvascular reconstruction due to heterotopic ossification of the vascular pedicle.

Figure 1: Fixation of free fibula flap for the upper alveolar augmentation and the post-operative orthopantomogram showing the fixation

Figure 2: Pre-operative orthopantomogram and three dimensional computer tomography scan showing bony block along the course of vascular pedicle of the free fibula flap
An 18-year-old male patient with anhidrotic ectodermal dysplasia presented to us with the absence of all teeth and underdeveloped upper and lower alveolar ridges. He needed upper alveolar reconstruction, as the alveolar bone thickness below the maxillary sinuses was barely 1 mm. In the lower jaw too, the bone height above the inferior alveolar nerve was not sufficient for the placement of implants. However, in the central segment, between the two mental foramina, the bone height was sufficient for implant placement. In October 2015, a free fibula transfer was performed for the upper alveolar reconstruction with fixation done using titanium miniplates [Figure 1]. In March 2017, the miniplates were removed, and osseointegrated implants were placed in the upper and lower alveolus. His mouth opening at the time was good enough to allow the intraoral manipulation necessary for implant insertion. However, the patient then felt progressively increasing trismus and reduction in jaw movements, until finally, he was unable to move his jaw at all. The orthopantomogram and the computed tomography scan revealed the presence of a bony block on the left side between the reconstructed maxilla and the ramus of the mandible below the coronoid process, along the course of the vascular pedicle [Figure 2]. He was operated on for removal of the bony block under general anaesthesia in January 2018. Through an intraoral incision along the upper gingivobuccal sulcus, extraperiosteal removal of a 1 cm block of bone from the ossified vascular pedicle was performed. Patient’s inter-incisor distance improved from 1 cm to 4 cm in the immediate post-operative period, with free movement of the lower jaw [Figure 3]. Histopathology confirmed that the excised block was showing normal bony architecture. Three months after the procedure, the mouth opening and jaw movements have been maintained and additional implants could be placed in his mandible [Figure 4].

Periosteum preserves its osteogenic potential, even after transposition, especially in a re-vascularised flap. When the fibula is used for maxilla reconstruction, the pedicle is usually routed to the neck near the mandibular ramus. Any periosteum retained with the pedicle is likely to ossify and fuse with the ramus at points of contact, thereby causing restriction of jaw movements, as in this case. Hence, care must be taken while harvesting and shaping the fibula to ensure that the periosteum is cut flush with the fibula, and no part of it stays with the pedicle.[4]

**Declaration of patient consent**
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Financial support and sponsorship**
Nil.

**Conflicts of interest**
There are no conflicts of interest.

**Nikunj Mody, Samir Kumta1, Shrirang Purohit1, Rani Ummul, Sushil Nehete, Leena Jain1**
Departments of Plastic and 1Reconstructive Surgery, Lilavati Hospital and Research Centre, Mumbai, Maharashtra, India

**Address for correspondence:**
Dr. Nikunj Mody,
1G, 91/92, Kalpataru Aura, L. B. S. Road, Ghatkopar West, Mumbai - 400 086, Maharashtra, India.
E-mail: nikunjbm31@yahoo.in
Fixators to retractors: Use of k-wires and glove rings as self‑retaining retractors

Sir,
Retraction is one of the most important facets in assisting a surgery. For this, there are numerous retractors in various sizes and shapes designed for retracting specific areas. They can be either handheld or self‑retaining retractors. Dissections in depth may need multiple retractors at the same time. Multiple assisting hands can often be counterproductive. Many a times, a surgeon may not have the luxury of multiple assistants. Under these circumstances, self‑retaining retractors can be a useful adjunct. Morrison's self‑retaining retractors are the commonly used ones for this purpose. However, applying more than one such retractor in the same field may be cumbersome. Fish hook retractors with rubber bands are very helpful, user‑friendly and simple‑to‑use retractors that can address all the above concerns. These are not only used for effective retraction, but also can reduce the number of assistants required. Although we could find many of these in online stores, we were reluctant to buy them, as they were very expensive. Hence, we tried to replicate these with whatever we could find in our operation theatre. Fish hooks used in angling were modified for this purpose. However, whether these hooks are of medical grade is questionable.

One Kirschner wire (k‑wire) with two sharp tips was cut into two in the middle. The sharp edge of each piece was bent and modified to form a hook [Figure 1]. A smaller loop was made with the other blunt end of the k‑wire. So, now, we had two hooks with a curved sharp end that can cling on to the tissue to retract and the blunt loop that can hold the glove ring. The roll at the wrist end of a glove is best suited for this purpose. Rings can also be cut out from fingers of gloves to engage hooks made out of thinner

REFERENCES

1. Deshpande SN, Kumar V. Ectodermal dysplasia – Maxillary and mandibular alveolar reconstruction with dental rehabilitation: A case report and review of the literature. Indian J Plast Surg 2010;43:92-6.
2. González‑García R, Manzano D, Ruiz‑Laza L, Moreno‑García C, Monje F. The rare phenomenon of vascular pedicle ossification of free fibular flap in mandibular reconstruction. J Craniomaxillofac Surg 2011;39:114-8.
3. Mays AC, Gillenwater AM, Garvey PB. Rare presentation of heterotopic ossification along a fibula free flap pedicle in a high‑volume microvascular reconstruction practice. Head Neck 2018;40:E21‑E24.
4. Tarsitano A, Sgarzani R, Betti E, Oranges CM, Contedini F, Cipriani R, et al. Vascular pedicle ossification of free fibular flap: Is it a rare phenomenon? Is it possible to avoid this risk? Acta Otorhinolaryngol Ital 2013;33:307‑10.