Title

Simple vestibuloplasty using a tube in combination with cortical bone screws around dental implant

In vestibuloplasty, the elevated flap is positioned on the periosteum at the sulcus by suturing. The harvested donor flap is often immobilized by sutures and appropriate pressure is applied from above for successful engraftment. A tube is occasionally placed in the deepened sulcus and suturing is done extraorally and tied over cotton roll bolsters to pad the skin from the sutures [1]. This maneuver, however, is somewhat invasive under local anesthesia. Therefore, we aimed to develop other methods, which can be performed comfortably and safely for both patients and doctors. Subsequently, we developed a novel, reliable and easy method that retains stability of the repositioned flap and vestibular expansion.

Technique

This novel technique is based on Clark's technique [2], and it is performed under local anesthesia on an outpatient basis.

A sharp incision is made on the alveolar ridge and a supraperiosteal dissection is performed apically to the desired depth. The elevated mucosal flap is secured to the desired depth of the vestibule by the pressure created by the polyvinyl chloride 6Fr suction catheter which is fixed to the alveolar bone with a Le Forte System screw (diameter 2.0 mm, length 6.0 mm; Jeil Medical Corp, Seoul, Korea) along the sulcus (Fig. 1). The cortical bone screws pass through the inner lumen of the tube and apically positioned mucosa. For grafting, the keratinized free flap harvested from the palatal region is placed on the periosteum conventionally and is subsequently sutured to the stump of the original mucosa at the anterior and posterior ends using 5-0 nylon (Fig. 2). For immobilization, horizontal mattress suturing is performed, with the suture running around the neck of the healing cap at the crestal side and through the inner lumen of the tube transversally at the sulcus side. The screws and stabilized tube are expected to act as a firm anchorage system intraorally and eliminate the need for anchoring sutures externally through the skin. Prepared splint were placed over the vestibuloplasty site for one week postoperatively. Screws are removed at the same time. Further, the patients continued to wear the splint by themselves for a few months. Oral hygiene instruction was provided. Favorable condition with the desirable depth, color and texture of keratinized oral mucosa (Fig. 3) could be obtained by local

manipulation without invasive procedures. At the labial side of the implant collar, the width of the keratinized tissue was increased from 2mm to 7mm in the present case and sulcus depth was also increased corresponding to the expansion of the keratinized tissue. For this evaluation, periodontal dental probe with markings is useful. At least up to three years after surgery, there are no visible contraction, gingival inflammation and recession at all.

Discussion

Initially, we tried to use several sole cortical bone screws for stabilization of the apically positioned flap after multiple single interrupted suturing of the flap to the periosteum at the sulcus. The screws, however, would sometimes get buried deep in the surrounding mucosa at a later time. This led to the idea of using a tube in combination with screws. As expected, the flap remained in its place, as it had been positioned with the help of cicatricial tissue created by the tube pressure at the sulcus. The suture running through the sustained tube enables application of the desired pressure to the graft from above due to the elasticity of the tube. This simple method gives us great benefit on the vestibuloplasty. Although there is no limitation for this method, attention should be paid not to injure inferior alveolar nerve near the metal region and tooth root by cortical bone screws.

References

1, Guernsey LH. Preprosthetic surgery. In: Kruger GO, editors. Textbook of Oral and Maxillofacial Surgery. 6th ed. St. Louis: Mosby; 1984. pp. 128-31.

2, Clark HB. Deepening of labial sulcus by mucosal flap advancement. J Oral Surg. 1953; 11: 165-8.

Figures

Figure 1

Split-thickness mucosal flap was prepared in the vestibule. The coronal margin was positioned apically and compressed by a tube and tightly fixed to the alveolar bone with cortical bone screws from above.

Figure 2

An epithelized free gingival graft harvested from the palatal region was placed on the prepared periosteum and immobilized by horizontal mattress sutures. The sutures run in the inner lumen of the tube at the sulcus side and around the abutments at the crestal side.

Figure 3

Postoperative condition. Healing caps are removed. Excellent emergence profile and adequate expansion with keratinized mucosa at the vestibule is presented.

Figure 1

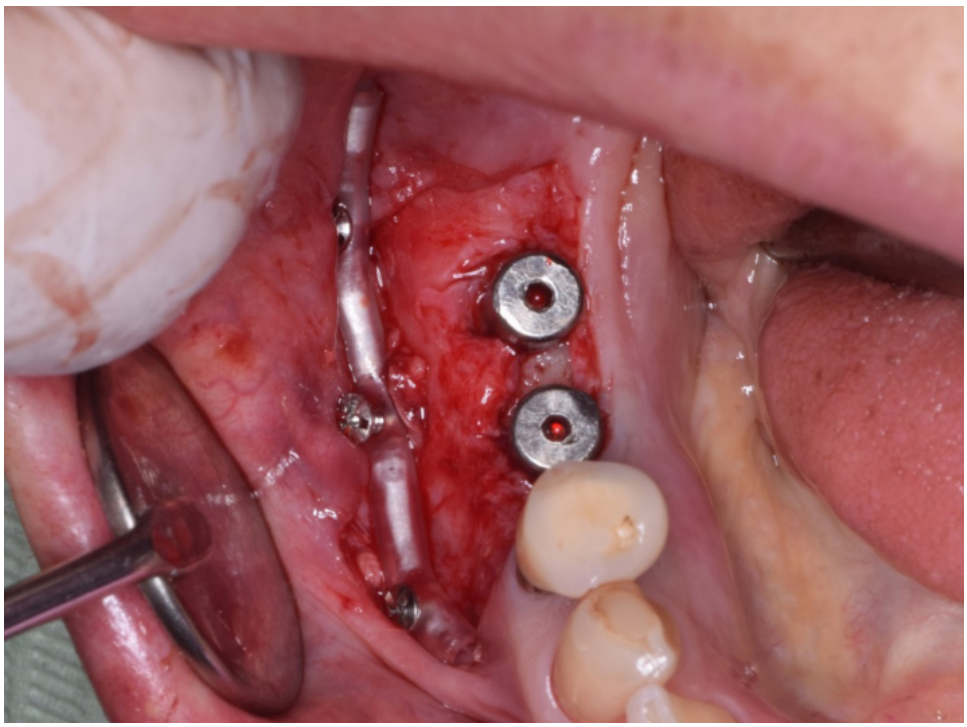

Figure 2

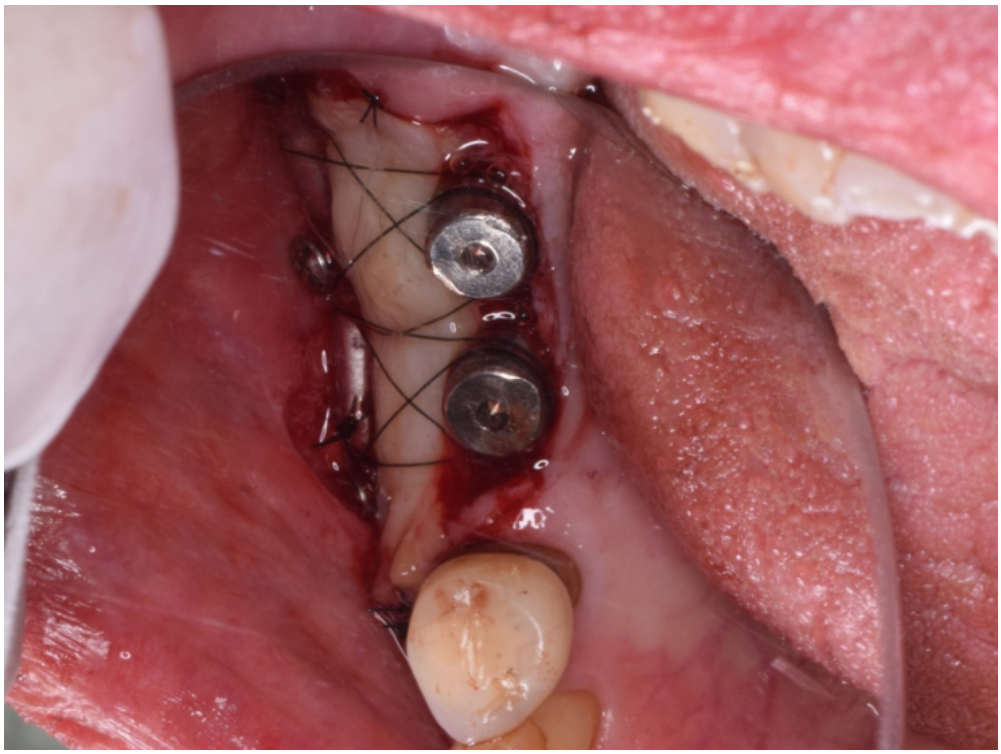

Figure 3