

## LASER ASSISTED PERIODONTAL PLASTIC SURGERY IN THE MANAGEMENT OF A BILATERAL COMPLETE CLEFT- A CASE REPORT

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### ABSTRACT

**BACKGROUND:** Periodontal plastic surgery proved to be useful in improving the esthetics and speech of the patient after from maintaining periodontal health.

**AIM:** To improve the lip mobility, speech and phonetics of a bilateral complete cleft patient.

**METHODOLOGY:** The treatment was performed in two surgical phases. The first phase involved a new modification of the conventional repositioning of the lip whereas the second phase involved vestibular deepening using a soft tissue laser.

**RESULTS:** Lip mobility and phonetics considerably improved after the surgical procedure. Good wound

healing with minimal scar tissue formation was evident. Soft tissue laser acts as a valuable tool in performing in such periodontal plastic surgery.

**CONCLUSION:** The modified lip repositioning technique is quite novel and has been prudent in treating a critical clinical scenario. Also this case report shows that a multidisciplinary approach is essential to achieve a holistic solution for cleft lip and palate patients.

**KEYWORDS:** Complete cleft, lip repositioning, periodontal plastic surgery, vestibuloplasty.

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### INTRODUCTION

Cleft lip and palate, being one of the most common congenital malformation occurring in the head and neck region has a prevalence rate of 9.3 per 10000 in India.<sup>[1]</sup> Orofacial cleft presents with functional and esthetic disabilities which impairs the quality of life.<sup>[2,3]</sup> Functionally, these patients have difficulty in speech, deglutition, oronasal communications etc. Utilization of soft tissue lasers in periodontal arena, have gained immense momentum in the past decade. Fibrotic tissue due to clefting in the facial region restrict pronunciation due to the thickness of tissue and shallowing vestibular sulcus depth. Periodontal plastic surgery could be beneficial in treating these deformities, especially by correcting the aesthetics and speech impairment. In this paper, we report a case of bilateral cleft lip where phonation was enhanced by increasing vestibular sulcus depth and thinning the tissues with the help of surgery and diode laser.

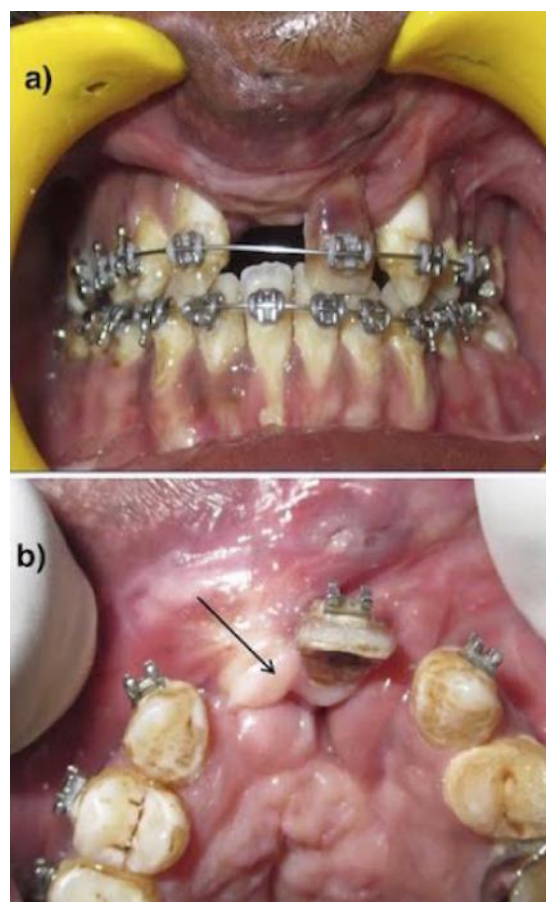
### CASE REPORT

A 23 year old male patient was referred from SMILE Care Clinic, Cleft Lip and Palate Department, Sri Ramachandra University, Chennai. The patient was surgically treated for closure of bilateral complete cleft and is currently under orthodontic management. On intra-oral examination, the patient had restricted mobility of upper lip and labial mucosa which was attached at the level of alveolar ridge which led to considerable obliteration

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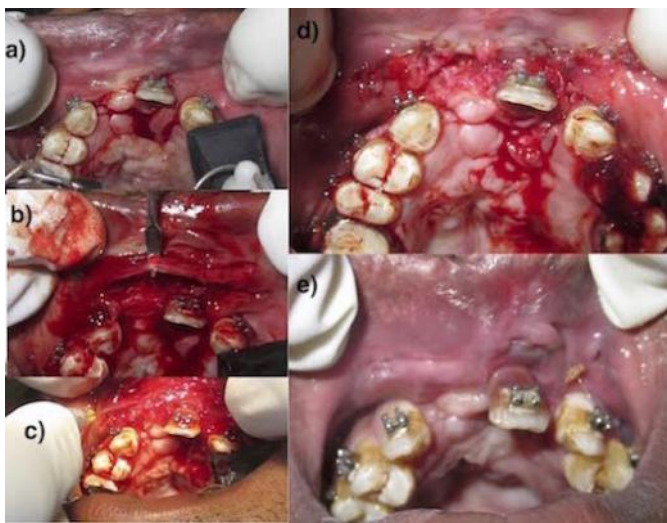
**Fig 1: Pre- Operative a) completely obliterated vestibule in relation to 11. b) labial fold of tissue seen attached palatally**

of vestibule in the maxillary anterior region (Fig.1a). Additionally a fold of labial tissue was seen attached palatally adjacent to the cleft leading to restricted movement of the upper lip (Fig. 1b). Complete hemogram with blood clotting profile and other

investigations were carried out. Physician opinion about fitness to undergo surgery was obtained. The patient's consent was obtained before surgery

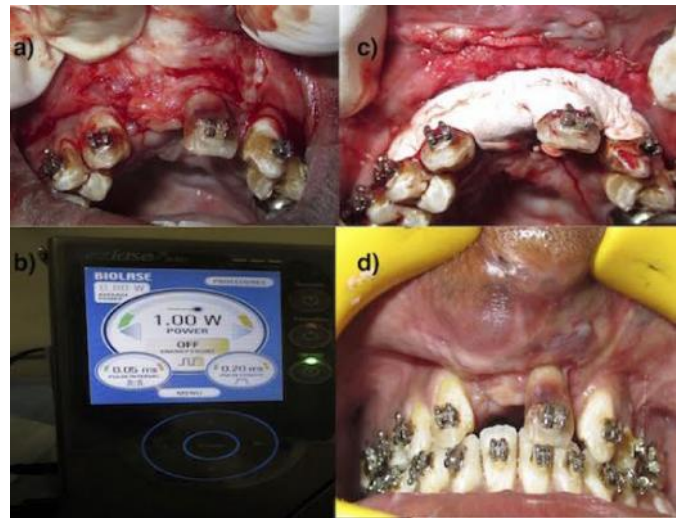
### SURGICAL TECHNIQUE

Extra oral and intra oral mouth disinfection was done with 2% betadine, followed by infiltration with local anesthesia, (2% lignocaine hydrochloride with 1:80,000 epinephrine). A two stage surgical treatment plan was planned. In stage 1, a modification of classical lip repositioning technique was performed. The first incision was given at the level of alveolar ridge where the labial mucosa was affixed extending from right maxillary canine (13) to left maxillary canine (23) and extended palatally to gain attachment to labial fold of tissue ( Fig. 2a). The second incision was given 10-12 mm parallel to the first incision and both the incisions were joined together in an elliptical manner. A split thickness flap was excised, exposing a very thick fibrous connective tissue (Fig. 2b). A layer of fibrous connective tissue was removed leaving behind a raw wound area which was lasered with a soft tissue diode laser (4.5 Watts power @ 810 nm wave length with a fiber-optic wire tip of 300 $\mu$ m diameter) and a laser bandage was given. (Fig. 2c). The labial mucosa was sutured at a more superior level in contrast to a classical lip repositioning technique with a 5-0 vicryl resorbable sutures. (Fig. 2d) Post-operative photographs revealed a superior lip affixment (Fig. 2e). In stage 2, deepening of the vestibule was done by utilizing soft tissue laser as an adjunct and the wound edges were approximated utilizing 5-0 vicryl resorbable sutures (Fig. 3a,b). Periodontal dressing (Coe-Pack,GC,Japan)[a5] was placed to mechanically protect the wound area (Fig. 3c). One month post operatively, vestibular sulcus depth was amended and lip was repositioned superiorly. Follow up after few months showed improved lip mobility and pronunciation (Fig.3d). Lip retraction did not have any pulling effect on the gingiva confirming the deepening of



**Fig.2: Modified Lip Repositioning. a) incisions placed. b) fibrous band of tissue excised) laser bandage given. d) lip sutured at a superior level. e) one month post operative image**

vestibular sulcus depth.



**Fig3: Vestibular Deepening. a) b) vestibular deepening done using laser. c) periodontal pack placed. d) one month post-operative image.**

### DISCUSSION

Orofacial cleft involves structures around the oral cavity which can extend on to the facial region resulting in oral, facial deformity leading to difficulties in phonetics and swallowing. Though the cleft defects are surgically corrected at early childhood the residual deformities resulting due to scar formation and asymmetrical facial changes resulting in functional deficiency and a severe psychological impact on the patients.

Treating cleft defects either of lip/palate involves a multi-disciplinary approach consisting of pediatrician, orthodontist, specialist nurse, cleft surgeon, speech therapist and ENT specialist to provide proper interventions, at the appropriate time to provide the best functional and aesthetic results for the patient.

In the present case, the patient had undergone surgical rectifications for closure of the cleft and was undergoing orthodontic treatment for alignment of teeth, however he was referred to the department of periodontics for rectification of his lip position, as he had difficulty in speech.

A modification of lip repositioning surgery, wherein the lip was positioned more apically rather than coronally as described in the original technique, for rectification of excessive gingival display<sup>[4]</sup> was carried out. By repositioning the lip apically we were able to rectify the labial fold of tissue that was attached palatally close to the cleft area which obstructed the patient's verbalization.

However we decided to do a secondary intervention through vestibuloplasty as the scar tissue associated with cleft had caused obliteration of the vestibule to the extent, that even after the lip repositioning surgery, the vestibular depth was inadequate. We opted for laser for vestibuloplasty because of its precision, comfort to the patient. Further, laser by sealing of capillaries by protein

denaturation and stimulation of clotting factor would induce lesser bleeding during procedure and post operatively and minimize healing time and oedema.<sup>[5]</sup> Moreover utilization of laser resulted in reduced wound contraction and scarring as laser wound induce lesser number of myofibroblasts<sup>[6]</sup> compared to conventional surgical technique (scalpel). Utilization of laser resulted in lesser post-operative complications.<sup>[7]</sup>

In conclusion management of cleft lip and cleft palate require a multi-disciplinary approach and periodontist may play a major role in the correction of intraoral soft tissue defects.

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