

Customized Flap Adaptor and Flap Stabilizer- A Step towards Enhancement of Intra-operative and Post-operative Flap Management

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Abstract: Many factors are known to play a role in flap necrosis, such as inadequate blood flow and disturbed venous drainage, which lead to decreased flap nutrition and necrosis. Aim of the study was to assess a custom made device for flap adaptation and stabilization for different flaps like nasolabial flap, Pectoralis major myocutaneous flap(PMMC), Collagen membrane, Buccal pad of fat etc. A device was fabricated using biocompatible and economical resources and used on patients and assessed for its compatibility and adaptation. It was further found that the device served the purpose to maximum and had many advantages. Hence fabrication of such a device would lead to reduction in many complications of various flaps used in head and neck surgeries.

Key words: Oral submucous fibrosis, pectoralis major myocutaneous flap, flap adaptation, flap necrosis.

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I. Introduction

Flap adaptation and stabilization is an important factor determining the outcome and results of various reconstruction techniques following surgical repair of certain ailments like Oral Sub-mucous Fibrosis, oral cancer, hyperkeratosis etc.

The aim of the study was to introduce a custom made device which can be used in stabilization and adaptation of various intra oral flaps and grafts which would enhance patient response thereby instilling positive outcome to entire course of treatment.

II. Material used for the fabrication

The materials used are as follows:

- Two metallic arms made of stainless steel bearing a one distal end(head) having concave internal and convex external surfaces.
- A metallic screw 5 mm in diameter and 2 inches in length.

III. Method of fabrication

Two metallic arms of stainless steel having broad heads which are concave on one aspect and convex on outer aspect were manipulated by drilling a hole almost halfway from the tip. A screw of 5 mm diameter and 2 inches in length was adapted with the help of a holding nut. This would help in approximation and release of both the metallic arms by rotating the screw anticlockwise and in clockwise direction respectively.

The arms were adapted in such a way that concave surface of head of one arm would receive convexity of another for ensuring proper gapless adaptation to the tissue it would receive. The terminal (proximal) ends of the arms were connected and fixed with a metallic screw.



Fig. 1. Flap Adaptor and stabilizer



Fig.2. Intra-oral adaptation of PMMC flap using flap adaptor and stabiliser



Fig. 3. Extra-oral adaptation of PMMC flap using flap adaptor and stabilizer

IV. How To Use

The flap or structure to be adapted will be held between the heads of the metallic arms in such a way that it occupies the space between the corresponding concave and convex surfaces of the metallic arms. The screw can be rotated in anticlockwise direction and tightened as per demand of need. It can be loosened by rotating the screw in clockwise direction.

V. Advantages

- The fabricated device serves many advantages including the most important among many that it has got lighter weight(35gms) .This will prove to be less cumbersome for the patient and also be tissue friendly as it will not distort it by its weight but only end up adapting it.
- It is very easy to fabricate and very easy to obtain all the resources for the construction of it.
- The fabrication of the device is economical and no complex designing and no expensive materials were utilized.

VI. Uses

1. The device would serve for adaptation of collagen membrane following reconstruction of intra-oral defects and would also allow proper stabilization of the same intra-operatively during suturing procedure for the same.
2. When reconstruction is done using Naso-labial flap following surgical intervention for treatment of OSMF, the adaptation of the used flap becomes of utmost importance and the device can serve the purpose as it provides excellent adaptation to buccal mucosa where the flap is in place.
3. Pectoralis Major Myo-cutaneous Flap is a routinely harvested flap for reconstruction of various maxillofacial defects. The fabricated device would be helpful in adaptation of the flap thereby reducing postoperative complications. Considerable reduction in postoperative hematoma, wound dehiscence can be achieved thereby rejecting flap loss and infections.

VII. Discussion

PMMC flap bears many complications as many literatures have stated so. In one of studies, 95 PMMC flap reconstruction were done as a primary procedure, and 5 were salvage procedure. PMMC flap was used to cover mucosal defect in 84 patients, skin defects in 10 patient and both in 6 patients. Overall flap related complications were 40% with a major complication in 10% and minor complications in 30%[1].

Surgical management of advanced oral submucous fibrosis (OSMF) using bilateral inferiorly based nasolabial flaps is becoming increasingly popular. Complications such as partial necrosis, intra-oral hair growth, unacceptable extra-oral scar, wound dehiscence, orocutaneous fistula, and pin-cushioning effect were reported in literature. Numerous complications can occur with the use of nasolabial flaps for the management of advanced oral submucous fibrosis [2].

The custom made device can be adapted to perfection in intraoral grafts of buccal pad of fat and stabilized in position thereby promoting early epithialization.

The other appliances described in various literatures have had their share of disadvantages like mostly they were made of acrylic and hence did not allow for sterilization and also were so bulky that some hampered the blood supply of the flap to which they were applied resulted in flap dehiscence

VIII. Conclusion

This custom made device which can be used in stabilization and adaptation of various intra oral flaps and grafts which would enhance patient response thereby instilling positive outcome to entire course of treatment. It is light in weight, less cumbersome, economical and easy to fabricate.

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Conflict of Interest and Informed Consent

There is no conflict of interest. This article does not contain any studies with animals or humans performed by any of the authors.

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