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Research Article

Alvogyl and Flowable Composite a Perfect Combination as a Double Strike for Palatal Wound Dressing After Soft Tissue Graft Harvesting: A Case Series

Soulafa Mohamed Belal*

BDS, MSc in Periodontology, Oral Medicine, Oral Diagnosis and Oral Radiology, Faculty of Dentistry, Tanta University, Egypt

***Corresponding Author:** Soulafa Mohamed Belal, BDS, MSc in Periodontology, Oral Medicine, Oral Diagnosis and Oral Radiology, Faculty of Dentistry, Tanta University, Egypt.

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Abstract

Aim: To assess the donor site (palate) pain assessment and wound healing following free gingival graft (FGG) harvesting using the sutured Alvogyl and flowable composite as wound dressing for the first time.

Method: Seven patients had been enrolled at this study, indicated for soft tissue augmentation for different purposes. The palate had been covered with sutured Alvogyl and flowable composite with additional fixation by 5/0 prolene suture material, using horizontal (Figure 8) suture technique. Patients were observed for 14 days post-surgical, the assessed parameters were: the early palatal wound healing, direct visual assessment of edema, suppuration, hemorrhage and necrosis, pain using the visual analogue scale (VAS), time of Alvogyl and composite retention intraoral and patient satisfaction through direct communication with the patient.

Results: All the participating patients showed an improvement of wound healing parameters. They stated a lower pain perception, less pain killer consumption and higher willingness for retreatment if indicated. No post-surgical complications were recorded. Both materials succeeded to be retained intraorally for minimum 10 days up to 14 days to be remove by the surgeon, which aid in all tested parameters improvement.

Conclusion: The sutured Alvogyl and flowable composite can present a very good alternative for palatal wound dressing after soft tissue graft harvesting, presenting an easy and cost effective method with long term stability in comparison to other means of protection.

Keywords: *Soft Tissue Graft; Palatal Graft Harvesting; Alvogyl; Flowable Composite; Suturing*

Introduction

The most critical part of mucogingival surgeries is the management of palatal donor site after soft tissue graft harvesting. Post-surgical discomfort, pain and delayed wound healing pushing the surgeon to search for the best way to manage the donor site after harvesting, with optimum result as much as we can [1]. Healing with secondary intension is the reason for delayed healing at the donor site. Bleeding, food adherence, tongue movement that may cause trauma, worsen wound healing and may induce secondary bleeding, for all these reasons the use of palatal coverage for wound site protection and help for better recovery [2].

A lot of methods have been used to manage those complications such as using acrylic palatal stent, collagen sponge with suturing, platelet rich fibrin (PRF) with suturing, cyanoacrylate wound dressing, Ora-aid patch and flowable composite. All those methods had shown their effectiveness, with more superior result for the palatal stent [3-7].

According to recent literatures, although the palatal stent whatever the type of material used for fabrication as acrylic or ethylene vinyl acetate (EVA) is considered the best method for palatal wound dressing after soft tissue graft harvesting [8], but sometimes we face some troubles with some patients to make it for them, as patient with high gag reflex tendency or the incorrect fabrication by the laboratory with no time for adjustment or patient undergoing orthodontic treatment will make impression taking for palatal stent fabrication is difficult. Recently, utilizing of Ora-aid patch with mean of suture fixation resulted in superior outcomes from the patient's and surgeon's perspective. The post-surgical pain declination and wound healing were moderately improved [9].

In searching for optimum method for palatal wound dressing, that could afford all the benefits that we are aiming for it, a trial was done by using combination of Alvogyl fixed with suturing and above it a flowable composite was applied and cured. Both methods had been tested separately in different studies previously.

Flowable resin composite is widely used after dental implant placement to make customized provisional prostheses fit tightly to the soft tissues, with a view to replicate the anatomy of the future permanent prosthesis [10]. In this clinical situation, the flowable resin composite is in contact with the gingival tissue. One clinical study of patients who underwent this approach showed complete epithelization of the soft tissues, and no inflammation was detected [11]. It could be speculated that the hemostatic properties of a collagen sponge, together with an additional sealing and protective layer of flowable composite resin, would contribute to decreasing the palatal pain after free gingival graft harvesting more than the use of a collagen sponge alone [10].

The problem is the collagen sponge is rapidly resorbing, it will liquefy in 7 days and is completely resorbed in 4 to 6 weeks. leaving the composite alone hanged over the suture used for sponge fixation and composite retention, causing some sort or pain and irritation upon movement due to the cured resin friction with wound and also become less stable, which may lead to early fall out of the composite.

Alvogyl is a brown fibrous mixture of butamben, iodoform, eugenol (active ingredients), and other ingredients, including olive oil, spearmint oil, sodium lauryl sulfate, calcium carbonate, penghawar djambi, and purified water [12]. Butamben is an ester local anesthetic, while iodoform is an iodine-based antimicrobial agent [13]. Eugenol, an essential oil derived from numerous plants, including cloves, has further remarkable pain reduction properties [14]. The penghawar djambi, a product of fibers of the Cibotium barometz tree [15,16], gives Alvogyl its consistency, making it easily adherent to soft tissues in the desired dimensions, and confers hemostatic attributes to Alvogyl. Its components are believed to be resorbable and readily integrating into the healing wounds [17], while suppressing the sensory pain perception through the inhibition of prostaglandins production. Currently, it is commonly employed to effectively manage alveolar osteitis with a rapid reduction in pain and infection [18,19] (Figure 1).

Figure 1: *Alvogyl.*

A recent randomized controlled trial was conducted to compare the effect of Alvogyl versus absorbable gelatin sponge as palatal wound dressings on postoperative pain, amount of analgesic consumption, post-surgical bleeding, and wound reepithelization. The study results suggested that Alvogyl as a practical palatal surgical dressing, comparable with absorbable gelatin sponge in cost, pain reduction, hemostasis, and re-epithelization properties [20].

Although of those high advantages concerning the Alvogyl, but still the taste of the incorporated materials not accepted by the patient, making them less comfortable of using it. Also, the affordable physical form of Alvogyl is friable, making it less stable even upon fixation with suturing, using horizontal (Figure 8) suture technique.

Due to those problems facing us in using each separate material, although their high advantages separately, that give us the idea to use both materials, the Alvogyl and flowable composite, in order to get the advantages of both materials and avoid the disadvantages of both as mentioned before, a double strike method as we can name it (Figure 2).

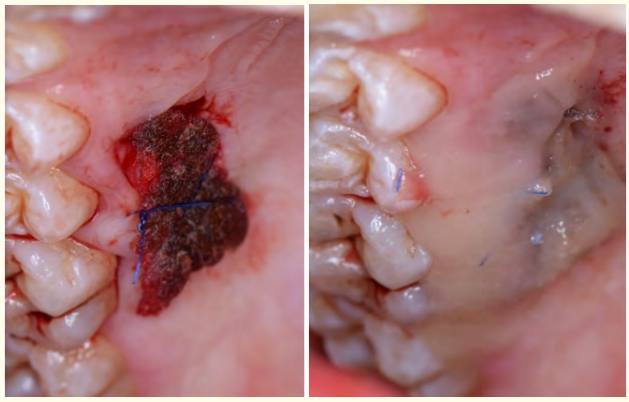

Figure 2: *Alvogyl in situ and cured flowable composite above it.*

Aim of the Study

The aim of this study, is to clinically evaluate for the first time the use of fixed Alvogyl with suture, using 5/0 suture to perform slinged horizontal (Figure 8) suture technique and above it we apply a flowable composite, evaluated for its retention time (both materials) and how that will affect the healing and postoperative pain sensation.

Material and Methods

Study population and including criteria

A total of seven patients were included in the study, five females and two males, with an average age of 25-40 years. Patients who are indicated for soft tissue augmentation procedures, either with root coverage or to increase the deficient keratinized tissue were medically free, non-smokers and with good oral hygiene.

Excluding criteria

Pregnant or lactating females, smokers, patient with untreated periodontal condition and patient with uncontrolled systemic condition.

Surgical technique

After harvesting the palatal soft tissue graft and fixing it at the recipient site, back to the donor site for management, irrigation was done to remove the blood clot, then the Alvogyl was applied by compression followed by fixing it with suture material, using horizontal (Figure 8) technique. After that, flowable composite was applied above the Alvogyl and the suture material, slightly extended to the palatal surface of the teeth, to get more retention for prolonged time (Figure 3-7).

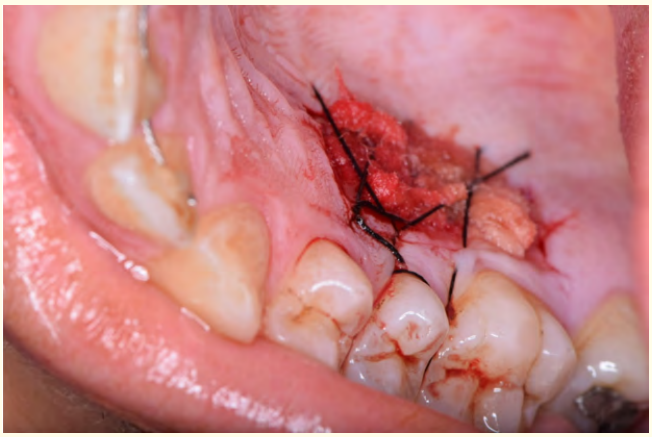

Figure 3: *Alvogyl sutured by horizontal figure 8 technique in place, case 1.*

Figure 4: *Composite above the Alvogyl, case 1.*

Figure 5: *Alvogyl sutured by horizontal figure 8 technique in place, case 2.*

Figure 6: *Composite above the Alvogyl, case 2.*

Figure 7: *Alvogyl and composite above it, case 3.*

Postoperative instructions

Patients were instructed to avoid hot and hard food for the next two weeks, not to disturb the wound area. Prophylactic antibiotic was prescribed for 5 days (Amoxicillin 500 mg, 8 hours per day) along with analgesic for 5 days (Ibuprofen 400 mg, twice per day) and mouth wash twice per day for the next 14 days till the time of suture removal (Chlorohexidine 0.12%).

Postoperative assessment

Patients were asked to report the time of shedding of the applied materials. Photographs of the donor site was taken after 14 days of surgery, at time of suture elimination.

The following parameters were evaluated and recoded at the same day:

1) Pain using the visual analogue scale (VAS) (Figure 8).
2) Time of Alvogyl and composite retention intraoral.
3) Wound healing assessment (Landry., *et al.* 1988).
4) Patient satisfaction through direct communication.

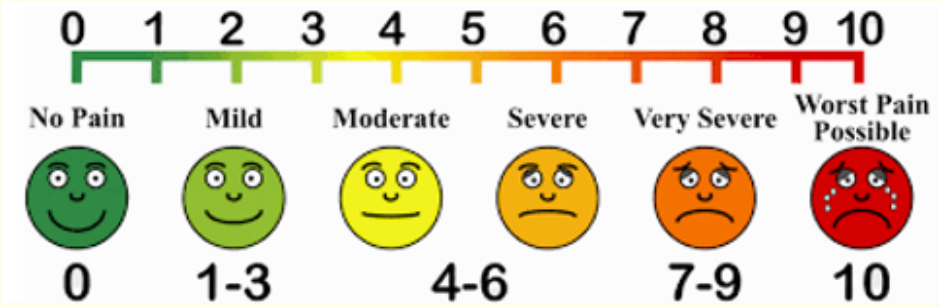

Figure 8: *Visual analogue scale (VAS).*

Results

The visual analogue scale was used to assess the pain immediately after surgery and 14 days later for each participant, and that were the results (Table 1).

Patient	Baseline	14 days
Patient 1	6	0
Patient 2	9	2
Patient 3	7	0
Patient 4	6	1
Patient 5	8	1
Patient 6	7	0
Patient 7	7	0

Table 1: *Assessment of pain by VAS.*

Retention time was ranged between 10-14 days, reported by the patient when asked, 5 cases the dressing was removed at the day of suture removal and follow up, it didn't fall out (Table 2).

Patient	Fall out time day NO.
Patient 1	0
Patient 2	0
Patient 3	13
Patient 4	10
Patient 5	0
Patient 6	0
Patient 7	0

Table 2: *Assessment of time of Alvogyl and composite fall out.*

Wound healing assessment (Landry., *et al.* 1988), this index assessed different aspects of wound healing including response to palpation, granulation tissue formation, incision margins and suppuration, and that were the results (Table 3 and figure 9-13).

Patient	Baseline	14 days
Patient 1	1	3
Patient 2	1	2
Patient 3	1	3
Patient 4	1	3
Patient 5	1	2
Patient 6	1	3
Patient 7	1	2

Table 3: *Assessment of wound healing.*

Figure 9: *Result after 14 days, wound dressing fall down the day before suture removal, case 1.*

Figure 10: *Results after14 days before dressing removal, case 2.*

Figure 11: *Results after14 days after dressing removal, case 2.*

Figure 12: *Results after14 days before dressing removal, case 3.*

Figure 13: *Results after14 days after dressing removal, case 3.*

All the seven patients have reported a high satisfaction with the used fixed Alvogyl and composite, that their pain sensation and discomfort were minimal, which made their consumption of analgesics is decreased.

Discussion

Soft tissue augmentation has long been performed for management of mucogingival problems, as for increase the deficient keratinized tissue around teeth and implants, also in case of gingival recession for root coverage [21,22]. One of the preferable sources for autogenous soft tissue graft harvesting is the palate. It represents an available site for soft tissue graft harvesting, providing reasonable surface area for graft harvesting bilaterally if indicated, in comparison to tuberosity and edentouls ridge [23].

The main problem that face the surgeon with the patient at this procedure is the postoperative discomfort at the palatal donor site. Adding to the other complications that may occur as secondary bleeding, swelling and necrosis [23].

Alvogyl is a well-known material used basically and effectively to manage alveolar osteitis with a rapid reduction in pain and infection [18,19]. Also composite used as palatal wound dressing material, which had been discussed in few articles before [10,11]. Both material is effective, but with some disadvantages. For the Alvogyl, the unaccepted taste by most of patient due to the impregnated materials within it and its fibrous structure which may aid in plaque retention causing offensive odor or properly infection source, also making it structurally unstable with tongue friction. On the other side, the composite is a resin material need to be light cured, which make it irritant if directly applied upon raw wound area as in case of palate after soft tissue graft harvesting, which always indicated to use collagen sponge below it to prevent its irritant effect. Also, it may be exposed to early fall out at the first week if not retained well upon the suture material used to support the collagen sponge underlying it.

In this study, we used both materials together, which showed less pain sensation and more comfort during two weeks post-surgical, with no or less analgesic consumption as reported by most of patients. Also, the composite found to be retained for longer period, minimum 10 days, maximum didn't fall out until it was removed by the surgeon. This is may be due to the rough surface of the Alvogyl with the presence of suture material too, aid in mechanical retention of the composite shield, give more protection of the wound site. The impregnated materials, such as eugenol, butamben and iodoform with their different effect as mentioned before, made the pain less and healing occurs smoothly.

Both materials are always available at any dental clinic, cost effective and easy to be applied and due to this study, superior results which may be compared to the most commonly used acrylic palatal stent, it can be introduced as a good alternative to it.

The Landry's wound healing index is quit explicit and takes into consideration several parameters like tissue color, bleeding, granulation tissue and closure of the incision margins. The scores range between 1-5 with 1 being very poor to 5 being excellent. In the current case series, the score was 1 at baseline for all cases. This improved significantly to score 3 which translates to good healing, in all but for 2 cases out of 7 on 14th day. The variation in the 2 cases could be explained due to patient related factors.

The quantification of pain is done through VAS scoring. In the present study, all the 7 patients scored at baseline and 14th day. All the baseline scores were high for obvious reasons and there was a significant decrease of scores on the 14th day post-operatively.

Conclusion

In this case series, using Alvogyl with mean of suture fixation and applying flowable composite above it resulted in superior outcomes from the patient's and surgeon's perspective. The post-surgical pain declination was significantly stated and wound healing was moderately improved. On conclusion, the combined method is an effective method and has potential for wider usage as a palatal wound dressing material, since it is available and cost effective materials, easy to apply with superior results at all tested parameters.

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