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Technical Report

# A Technical Modified Method for Harvesting Palatal De-epithelialized Connective Tissue Graft for Root Coverage: A Case Report.

**Nada Zazou[1], Hani El Nahass[1] and Azza Ezz El-Arab[1]**

[1] Department of Oral medicine and Periodontology, Faculty of Dentistry, Cairo University, Cairo, Egypt.
E-mail: drzazou@hotmail.com

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## Abstract

**Introduction:** This case report describes a technical modified method for harvesting a de-epithelialized connective tissue graft used for root coverage procedure. This simplified, time saving approach can be used as an alternative to the conventional subepithelial connective tissue graft or de-epithelialized grafts previously introduced. **Case Presentation**: A healthy 22-year-old male patient presented with a 2 mm recession on tooth #24 and a 1 mm recession on tooth #25 caused by periodontitis. **Results**: Root coverage procedure was performed using a de-epithelialized graft harvested by a modified method from the palate. The modification is to de-epithelialize the graft with the desired dimensions on the palate and then harvest it already de-epithelialized. Complete root coverage with stable 2 year follow-up was documented. **Conclusions:** Recession defects can be treated with a modified de-epithelized graft harvested from the palate without significant inflammation. This technique may serve as an alternative for the conventional SECTG or de-epithelialized grafts.

**Keywords:** Root coverage, Connective tissue graft, Recession, Soft tissue graft

## 1. Introduction

Subepithelial grafts have always been a versatile tool in the hand of periodontists since its introduction by Langer and Calagna in 1980 *(1)*. Soft tissue grafting has been used with great success in increasing the zone of keratinized tissue, improving the biotype or root coverage procedures (2).

The palate remains the most common site for harvesting soft tissue grafts. The palatal mucosa consists of a dense layer of connective tissue covered by orthokeratinized epithelium and a submucosa consisting of fatty and glandular cells *(3)*.

Different connective tissue grafts "CTG" harvesting techniques were described in the literature. The established harvesting technique has been the subepithelial connective tissue graft (SECTG) *(4;5;6;7)*. It had the advantage of primary closure of the donor site yet included a considerable amount of undesirable fatty glandular tissue "FGT" *(8)* and had the risk of inducing damage to the greater palatine nerves and vessels as the harvesting went deep down to bone. In addition, donor site morbidity was sometimes significant due to sloughing and necrosis of the overlying palatal tissues, excessive bleeding, prolonged pain/discomfort and infections (9).

In order to avoid the aforementioned complications and increase the ability to harvest CTG from a more

 

shallow level of tissues the idea of the de-epithelialized grafts emerged *(10, 11)*. Some reports have discussed that the harvesting technique can affect massively the quality of the harvested graft. Bertl et al., 2015, concluded that a de-epithelialized CTG, consists mainly of lamina propria that contains more fibrous CT and less FGT compared to SCTG that consists mainly of the submucosa *(12)*.

## 2. Clinical Presentation

A 22 year old male presented to our practice. The examination revealed a 2mm recession in tooth 24 and 1mm in tooth 25. Absence of keratinized gingiva and very thin biotype were observed on 24. Medical history was insignificant. Phase I therapy was performed and oral hygiene instructions were explained. 4 weeks later the patient was re-evaluated and hygiene instructions were re-enforced. 8 weeks later the patient had acceptable oral hygiene and was scheduled for root coverage procedure (Fig. 1).

### *Case Management*

A Trapezoidal flap was performed followed by sharp dissection using 15C blades (Fig. 2). De-epithelialization of the papillae was performed for proper suturing. At the donor site, a modified technique was performed to harvest the de-epithelialized graft. A large coarse high speed round diamond stone under copious irrigation was utilized to de-epithelialize the graft (Fig. 3). A partial thickness incision was then performed to harvest the de-epithelialized graft from the palate (Fig. 4). The graft was sutured to the recipient bed using periosteal and crossing over resorbable sutures to stabilize it (Fig. 5). The flap was coronally positioned and sutured in place (Fig. 6).

### *Clinical Outcomes*

The patient was recalled for follow up at 1, 2 & 4 weeks and at 3, 5, 8, 12 & 24 months. Healing of the donor site was uneventful. At 24 months, complete root coverage, increased zone of keratinized gingiva and the improved biotype was observed (Fig. 7).

## 3.Discussion

The aim of our procedure was not limited to root coverage but also improving the biotype and augmenting the zone of keratinized gingiva. According to the decision tree published by Leong & Wang, 2011, if the main purpose of the surgical procedure is root coverage and increasing the biotype so the technique of choice is the combination of SECTG and coronally advanced flap (2).

Throughout the years CTG was harvested as a SECTG, where a split thickness incision is performed and the CTG is harvested and then primary closure is obtained (2; 4; 6).

Recently the concept of the de-epithelialized grafts began to develop due to the reconsideration of the thickness and size of the desired grafts. Zucchelli et al., 2003 concluded that thin grafts may result in better esthetics than thick grafts with comparable root coverage results (13). On the other hand, primary closure on the donor site seized to be a major concern due to harvesting thin and small grafts with less probability of bleeding and/ or postoperative morbidity. In addition, Harris, 2003 noted that there is a strong variability in the quality of the grafts harvested depending on the harvesting technique. He concluded that the best method to increase the amount of lamina propria of the graft is obtaining more shallow grafts (3).

The rationale of a graft consisting predominately of lamina propria is that it contains larger amounts of fibrous CT and much lower amounts of undesirable fatty glandular tissues (12).

In previous publications de-epithelialized grafts were obtained as a FGG and then de-epithelialized using a sharp blade extraorally (11, 14 & 15). We think the draw backs of this technique is the inevitable time lapse where the graft remains extraorally, deprived from blood supply for a considerable period of time. The proposed technique allows the harvesting of the graft and immediate placement on the recipient bed with no time lag till the blood supply is restored.

According to Harris, 1997 the graft should not be devoid of blood supply for more than 60 seconds. Therefore, the proposed technique has the advantage

of shorter time over the conventional de-epithelialized FGG, where the graft is harvested and de-epithelialized extraorally (16).

Liu et al, 2010 reported the existence of uni-potent stem cells amidst the normal basal keratinocytes which gives special interest to the basal cell layer, potentially having a high regenerative capacity to transform into other types of cells (17). This might answer our concern of "what if some epithelial cells got entrapped into the de-epithelialized graft?" Moreover, Harris, 2003 denoted that 80% of the SECTG harvested with the conventional method contained epithelial remnants and that this did not affect the graft success clinically (3).

Our graft meets the criteria of the ideal graft stated by Harris, 1997 (16).

1. Adequate size.

2. Desired results "complete root coverage".

3. Quick, and easy to harvest (2-3 mins harvesting time).

4. Minimal patient discomfort and postoperative complications.

5. Rapid healing of the donor site.

Further clinical trials are needed to evaluate this technique and possibly further histological studies to evaluate the quality of the obtained graft.

**Figure (1):** Clinical examination revealed a 2mm recession, thin biotype and absence of keratinized gingiva in tooth 24 and a1mm recession in tooth 25.

**Figure (2):** A trapezoidal partial thickness flap is reflected using 15C blades and de-epithelialization of the interdental papillae using micro scissors.

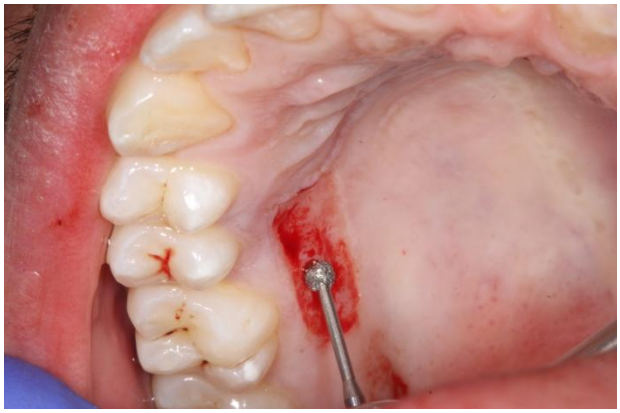

**Figure (3):** On the donor site, de-epithelialization of the connective tissue graft was performed using a large coarse high speed round diamond stone under copious irrigation.

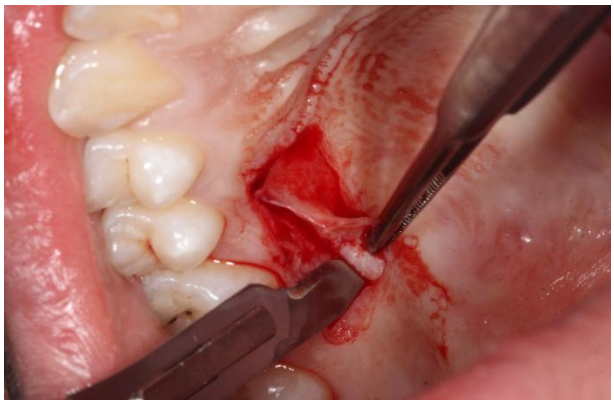

**Figure (4):** Harvesting the de-epithelialized graft: A partial thickness incision is performed to separate the de-epithelialized graft from the donor site.

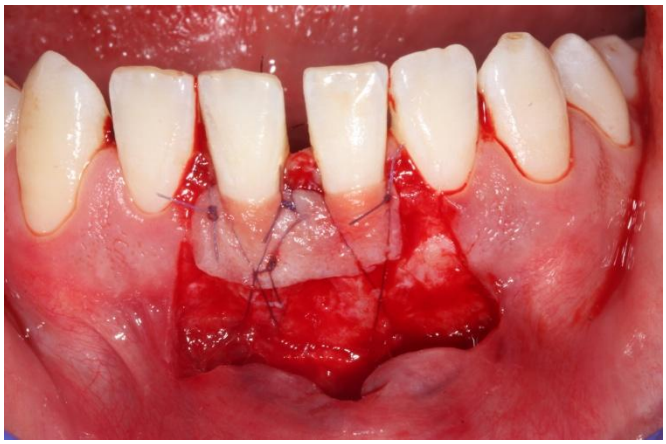

**Figure (5):** Periosteal and crossing over sutures are used to stabilize the graft on the recipient bed.

**Figure (6):** Suturing of the coronally positioned flap.

**Figure (7):** 24 month follow up. Note the complete root coverage as well as improved biotype & increased zone of keratinized gingiva.

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