Does the Papilla Preservation Flap Technique Induce Soft Tissue Modifications over Time in Endodontic Surgery Procedures?

Silvio Taschieri, MD, DDS,[*†] *Massimo Del Fabbro, BSc, PhD,*[*†] *Luca Francetti, MD, DDS,*[*†] *Isabella Perondi, DDS,*[*†] *and Stefano Corbella, DDS, PhD*[*†]

Abstract

Introduction: The aim of the present controlled clinical trial was to compare 2 incision techniques, papilla base incision (PBI) and sulcular incision (IS), evaluating changes in papilla and recession height over a 12-month period. **Methods:** A total of 24 subjects requiring endodontic surgery on a single tooth were enrolled. PBI was used in 1 group and IS in the other group. The primary outcomes were changes in gingival recession of the tooth affected by periapical lesions and the mesial and distal teeth and the mesial and distal papilla height using the treated tooth as the reference. Outcome variables were assessed at baseline and 12 months after the surgical intervention. Statistical analysis was performed by a blinded operator through appropriate tests, with significance set at a *P* value equal to .05. **Results:** In the PBI group, the papilla height at the 12-month follow-up in the mesial and distal aspect decreased 0.10 ± 0.32 mm and 0.10 ± 0.32 mm, respectively, and 0.23 ± 0.68 mm and 0.25 ± 0.40 mm, respectively, in the IS group without any significant differences. There were no differences found for recession change values between groups. **Conclusions:** The PBI and IS approaches in endodontic surgery showed similar results in terms of papilla height preservation and recession changes. *(J Endod 2016;42:1191–1195)*

Key Words

Apicoectomy, interdental papilla, oral surgical procedure, periodontal indexes

Significance

Papilla preservation flaps could safely be applied to endodontic surgery procedures. The results obtained (12 months after surgery) with this approach in terms of papilla height changes and gingival recession are expected to be similar to cases treated with intrasulcular flaps.

The aim of endodontic treatment is to obtain the resolution of pulp pathosis through the eradication of pathologic microbiota by proper root canal shaping in order to perform efficient cleaning and an adequate 3-dimensional filling (1). Endodontic surgery is recommended in all cases of apical periodontitis in which orthograde retreatment failed or is not feasible (2).

A modern endodontic surgery approach was first described in 2006 (3, 4) as a change to the standard protocol and implies a microsurgical approach in flap management, resulting in a mean weighted success rate of 89% 1 year after treatment (5).

Adequate management of soft tissue during endodontic surgery should be considered mandatory to obtain satisfactory healing, without impairing esthetics and function (6). The attempt to preserve interdental papillary tissue through a papilla base incision (PBI) flap was described in the literature as favoring soft tissue healing (7–9) 6 and 12 months after surgery as well as postoperative quality of life (10) compared with a sulcular flap. However, 1 short-term comparative study found better soft tissue preservation in the early postoperative period (first 2 weeks) using a PBI approach compared with an intrasulcular flap although it did not find a significant beneficial effect of PBI for soft tissue healing after 6 months at the level of the tooth with a lesion (11). This particular flap design could be considered a modification of the papilla preservation flaps proposed in periodontal conservative (12) and regenerative surgery (13, 14). In detail, the purpose of PBI is to obtain access to the periapical lesion without mobilizing the interdental papilla, thus preserving that tissue for flap repositioning and suturing in order to achieve a satisfying esthetic outcome. This aim was similar to those proposed in studies about periodontal surgery without papilla mobilization (15, 16). One recent article even reported an improvement in the height of gingival buccal and interdental recession in teeth treated with the so-called single-flap approach (17), which is comparable with the PBI flap. This was explained by the observation that flaps created with the papilla preservation technique were less prone to cause gingival tissue recession on the involved teeth than sulcular flaps (18) when evaluated 12 months after the surgical intervention.

The purpose of the present 12-month study was to evaluate gingival recession height (on the treated teeth and on adjacent ones) and papilla height after endodontic surgery, comparing PBI flaps and sulcular ones. The null hypothesis was that both treatments are equally effective when evaluated 12 months after surgery.

From the *Department of Biomedical, Surgical and Dental Sciences, Università degli Studi di Milano, Milan, Italy; and †IRCCS Istituto Ortopedico Galeazzi, Milan, Italy.

Address requests for reprints to Dr Stefano Corbella, IRCCS Istituto Ortopedico Galeazzi, Via R. Galeazzi, 4, 20161 Milan, Italy. E-mail address: stefano.corbella@gmail.com

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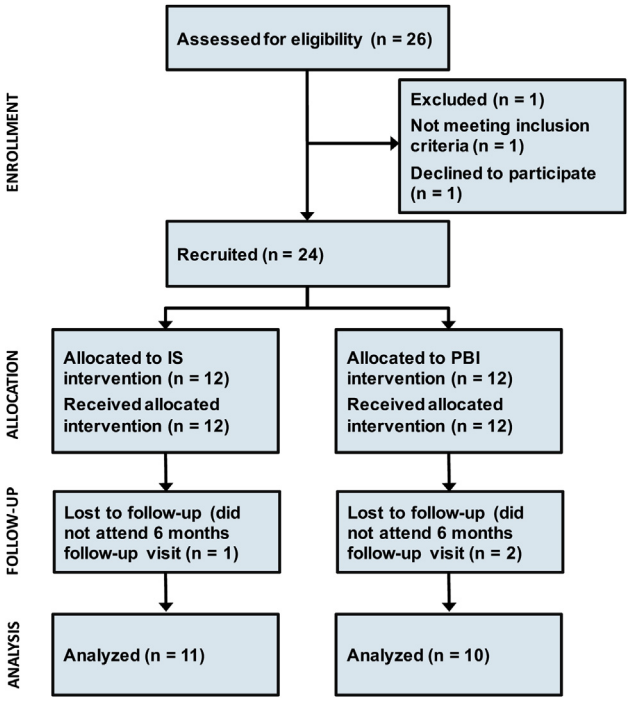

Figure 1. A diagram of patients' flow.

Materials and Methods

The study followed the guidelines provided in the CONSORT statement (19). The research protocol of the study was approved by the review board of the IRCCS Istituto Ortopedico Galeazzi, Milan, Italy, in 2013 (2.25). All subjects were treated following the principles included in the Helsinki Declaration and its further modifications (20). The patients were exhaustively informed about the study protocol and the surgical procedures as well as the potential complications and drawbacks. After that, all patients signed a written consent form before entering the study.

Data about outcomes were recorded and analyzed in the dental clinic of the IRCCS Istituto Ortopedico Galeazzi. To address the purpose of the study, a nonrandomized comparative design with parallel groups (ratio 1:1) was adopted.

Eligibility Criteria

All patients were chosen from among those attending the dental clinic of the IRCCS Istituto Ortopedico Galeazzi.

To be included in the study patients had to be 18 years old or older; have no systemic conditions representing absolute or relative contraindications to surgical interventions, classifiable as American Society of Anesthesiologists 1 or 2; have at least 1 tooth requiring endodontic surgery; be nonsmokers or former smokers or smoke fewer than 10 cigarettes a day; be periodontally healthy according to the Armitage classification, with fewer than 4 sites with a probing depth greater than 4 mm (21); have a full-mouth bleeding score and full-mouth plaque score lower than 25%; and be able to completely understand and sign an informed consent form.

Patients with acute symptoms (such as swelling, pain, or abscess) at the affected tooth level were excluded, as were nursing or pregnant patients and for them the intervention was postponed.

Interventions

All surgeries were performed by 1 oral surgeon (S.T.) with more than 10 years of experience in endodontic surgery and a periodontal surgery background. Local anesthesia with articaine 4% and epinephrine 1:100,000 was gently administered, avoiding blood vessels, deeply apical in the position of the affected tooth and the mesial and distal one. After that, a mucoperiosteal triangular flap was elevated, and the horizontal incision extended from the vestibular aspect of the mesial tooth and the distal aspect of the distal tooth. Sulcular incisions were continued in the interproximal (papillary) region in the control group (the IS group), whereas in the test group (the PBI group) a PBI incision was performed (9). The PBI consisted of 1 horizontal incision at the base of the papilla in the lingual direction, which continued, after 0.5–1 mm, in the direction of the bone crest (vertically) parallel to the long axis of the tooth. The vertical incision was placed at least 2 teeth distal to the affected tooth. After that, the flap was elevated and retracted carefully during the surgical procedure and continuously irrigated with sterile saline solution.

TABLE 1. Patients' Baseline Characteristics

	PBI group (*n* = 10)	IS group (*n* = 11)	Difference
Age (y)	47.2 ± 12.57	45.77 ± 12.19	NS
Men/women			
Anterior teeth/posterior teeth	10/0	9/2	NS
Distance of the lesion to CEJ (mm)	7.10 ± 2.20	6.95 ± 1.21	NS
Lesion vertical diameter (mm)	5 ± 1.31	5.63 ± 1.58	NS
Lesion horizontal diameter (mm)	6.15 ± 4.40	6.81 ± 3.14	NS
Papilla height (mm)			
Mesial	4.45 ± 0.83 (3.93–4.97)	4.77 ± 1.19 (3.87–4.03)	NS
Distal	3.95 ± 0.86 (3.41–4.49)	4.55 ± 1.08 (3.87–5.22)	NS
Recession (mm)			
Distal tooth			
Mesial	0.10 ± 0.32 (−0.32 to 0.30)	0.05 ± 0.15 (−0.05 to 0.14)	NS
Vestibular	0.25 ± 0.54 (−0.8 to 0.58)	0.27 ± 0.61 (−0.10 to 0.65)	NS
Distal	0.00 ± 0.00	0.05 ± 0.15 (−0.05 to 0.14)	NS
Affected tooth			
Mesial	0.00 ± 0.00	0.32 ± 0.46 (0.03–0.60)	<.05
Vestibular	3.95 ± 0.86 (−3.41 to 4.49)	0.36 ± 0.64 (−0.03 to 0.76)	NS
Dital	0.00 ± 0.00	0.27 ± 0.47 (−0.02 to 0.56)	NS
Mesial tooth			
Mesial	0.00 ± 0.00	0.36 ± 0.67 (−0.05 to 0.78)	NS
Vestibular	0.00 ± 0.00	0.64 ± 1.10 (−0.04 to 1.32)	NS
Distal	0.00 ± 0.00	0.27 ± 0.25 (−0.13 to 0.67)	NS

CEJ, cementoenamel junction; IS, sulcular incision; NS, not significant; PBI, papilla base incision.

Data are presented as number or mean ± standard deviation (95% confidence interval).