

THE FLAP RECOVERY ON THE IMPACTED LOWER THIRD MOLAR SURGERY COMPARING 3 DIFFERENT FLAP DESIGNS: A CLINICAL STUDY

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SUMMARY

Aim. The purpose of the study was to analyze the healing of the deep and superficial lower first and second molars periodontium, after the surgical extraction of the contiguous impacted third molar, comparing 3 mucoperiosteal flap designs. **Materials and methods.** 150 patients which had to undergo a impacted lower third molar surgery were enrolled in this study. They were checked from day 0 to day 90, in order to focus on the recovery quality of the soft tissues around the lower second molar, comparing 3 different flap designs.

Results. No intraoperative incident happened. The complete recovery of the periodontium around the second molar has been shown in each patient after 90 days from surgery and each adverse reaction happened within the sixth week after surgery. Only 2 slight gingival recessions 0,5 mm have been find out.

Conclusions. The impacted third molar surgery is an operation that, if rightly programmed and performed, is relatively safe. Besides, the correct handling and management of periodontium around the second molar and the choice of the flap type to be used support a correct recovery on the second molar periodontium, avoiding any long-term damage.

Clinical significance. This study wanted to analyze the healing of the deep and superficial lower second molar periodontium, after the impacted lower third molar surgery. In order to improve the surgical technique used for lower third molar germectomies, we wanted to compare 3 different kind of flap designs.

Key words: impacted third molar surgery, lower second molar periodontium.



Introduction

The aim of the study was to analyze the healing of the deep and superficial lower second molar periodontium, after the surgical third molar extraction of the contiguous third molar, comparing 3 mucoperiosteal flap designs (1, 2). The first flap design (flap A, Figure 1) was a three

corner flap with one vertical releasing incision distal to the second molar (not involving second molar marginal periodontium). The second flap design (flap B, Figure 2) was a three corner flap with one vertical releasing incision mesial to the second molar (involving second molar marginal periodontium) (3); the vertical releasing incision is developed from the half of the papilla between the first and second molar to the first molar fur-

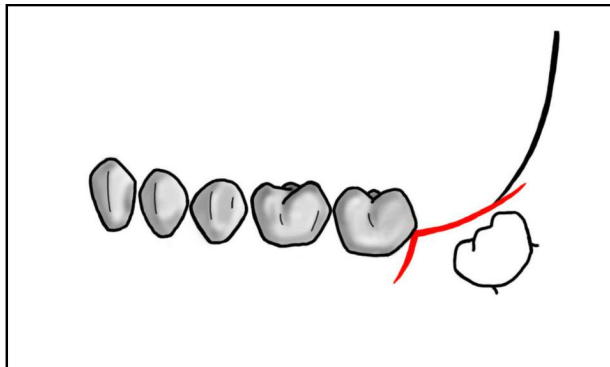


Figure 1
"Flap A" design.

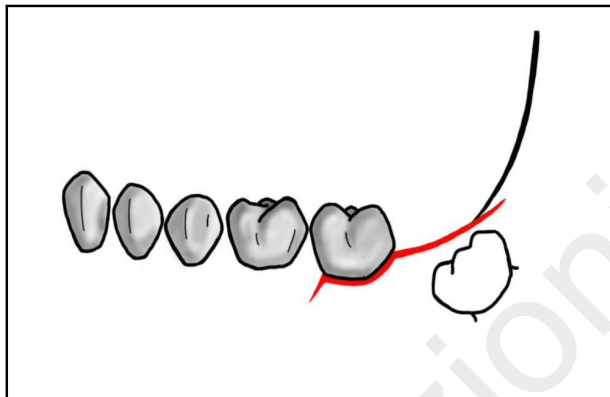


Figure 2
"Flap B" design.



cation) (2). The third flap design (flap C, Figure 3) was a paramarginal flap extended to the first molar (in more than two molares) that involves the marginal parodontium of three dental elements, without release cuts. The surgeries were managed in "San Giovanni Calibita Fatebenefratelli", a hospital linked to "Tor Vergata" University, in Rome.

Materials and methods

The patients were chosen among those who had to undergo at least one lower third molar im-

pacted surgical extraction (4). Patients with compromised health conditions or under a drug therapy were excluded from the study. Patients with periodontal or teeth diseases were also excluded. The suture material employed was Vicryl 4-0 USP with a SH-2 needle (SH-1plus for Ethibond Excel one), 1/2 circle with taper point because of its being one of the least dangerous for the periodontal health (5). All the patients were operated by the same surgeon, in order to standardize the surgery.

The osteotomy and odontotomy were managed by high speed rotary handpiece with tungsten carbide burs, all made from the same manufacturing company (6).

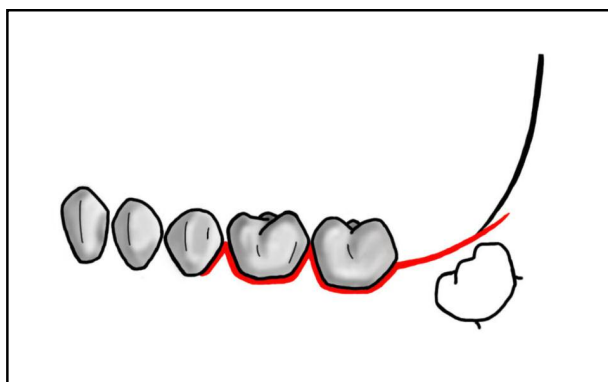


Figure 3
"Flap C" design.

The bur models were:

1. long shank round bur;
2. short shank cylinder crosscut bur;
3. long shank cylinder crosscut bur;
4. extra-long shank slot crosscut bur.

The lower third molar surgery consisted in: troncular nerve block and local infiltration anesthesia with 3% carbocaina without any vasoconstrictor, mucoperiosteal flap design and incision with n°15 Bard-Parker cold scalpel blade, its elevation, osteotomy and odontotomy (if needed), then impacted tooth dislocation and removal. The flap was finally sutured (6). In order to eliminate any variable linked to the surgeon, such as operative rapidity and pharmacological therapy prescribed, each patient had undergone the same practices. These practices provided three stages and three- and six-month recovery tests.

First stage:

- Case sheet writing;
- Medical history writing;
- Urine tests;
- Blood tests;
- Electrocardiogram.

Second stage (1st day):

- First stage tests checking;
- Antibiotic therapy (amoxicillin: 1 g tablets every 12 hours for five days);
- Before-surgery-antibiotic giving (amoxicillin

1 g, one tablet);

- Pictures of the areas which were going to be treated;
- Pictures of the radiographies carried out (Ortopantomography and TC Dentscan, if it was made);
- Checking of the Silness and Loe Plaque index (PI) on the second molar next to the molar which is being operated;
- Recording of second molar probing values (pocket depth and loss of attachment);
- Patient preparation;
- Choice of the flap A, B or C;
- Carrying out of the surgery;
- Pictures of the operated tissues;
- Analgesic therapy administration: 1000 mg paracetamol oral tablets;
- Prescription of mouthwashes (50% hydrogen peroxide and 50% water) twice a day, starting from the day after surgery until the tenth day; patients were moreover advised not to wash and brush their teeth during the whole day of surgery;
- Discharging.

Third stage (10th day):

- Healing checking;
- Plaque index recording;
- Sutures removal;
- Pictures of the treated areas;
- Check of the filled form and scale.

Fourth stage (17th-20th day):

- Healing and adverse reactions monitoring;
- Fifth stage (90th day):
- Healing checking;
- Plaque Index (PI) on second molars checking;
- Annotation of second molar probing values (pocket depth and loss of attachment);
- Pictures of the treated areas;
- Endoral X-rays of the postoperative site.

Results

A total of 150 patients was included in the study and they were checked from day 0 to day 90 from surgery. The data collected were: patients' age and gender, the flap type, any treated soft and hard tissue adverse reactions, Plaque Index (PI), evaluation of the whole recovery quality at the end of the 90 days from treatment. The 56,6% of the treated patients were females (85 subjects), the 44,4% were males (65 subjects). Patients were from 14 to 21 years old.

The study population was divided into three groups in order to the kind of surgical treatment received: 33,3% of the patients was treated by means of flap A; 33,3% by means of flap B and 33,3% by flap C.

About the post-operative complications, we found that: five surgical sites (two on the 3.8 area and three on the 4.8 area, two sites operated by the flap A, two sites operated by the flap B and one by the flap C) showed slight exudate and a hyperaemic mucosa after 10 days from surgery. During sutures removal, mucosa was hyperaemic and hypertrophic in only six cases; among them, three on the 3.8 area and three on the 4.8 area, two cases were operated by flap A, three cases were operated by B flap and one by flap C. Only ten cases showed a hypertrophy after 20 days: six of them in the 3.8 area and four cases in the 4.8 area; three operated by flap A, five operated by flap B and two by flap C. We found two slight gingivals recessions (0.5 mm); one localized on the bucco-distal face of a sec-

ond left molar, involved in the flap B design, and one was found on the mesial-face of second left molar, involved in the flap C.

After 20 days from surgery, 31 patients in the 3.8 area and 21 patients in the 4.8 area, 21 patients operated by flap A, 24 operated by flap B and 9 by flap C, the areas over the post-extractive alveoli did not show a complete recovering, remaining a post-operative cavity partially epithelised. In these cases the patients were asked to carry out mouthwashes by means of hydrogen peroxide charged in a needle-less syringe every night until complete recovering. Only in 3 cases the patients had to repeat the antibiotic therapy 30 days after surgery. At the end of the 90th day recovery was complete in all the cases, with the exception of one hypertrophy, which were later treated by means of a gingivectomy (distal wedge technique, that is Prichard's technique). Figure 4 shows the difference of probing values between day 0 and day 90th. A mean of the values obtained from the probing on the lower second molar next to the surgical area was drawn. The positive values stand for a loss of attachment, while the negative ones for its recovery. From a clinical point of view all the patients showed the complete site recovery after 90 days. From a radiographic point of view no anomalies or recovery delays were checked.

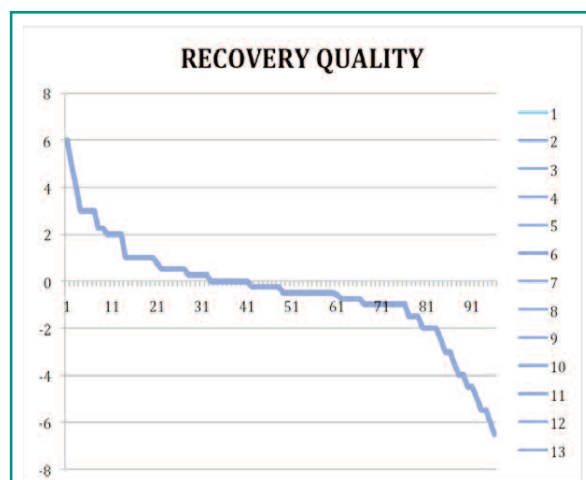


Figure 4
Difference between day 0 and day 90th probing values.

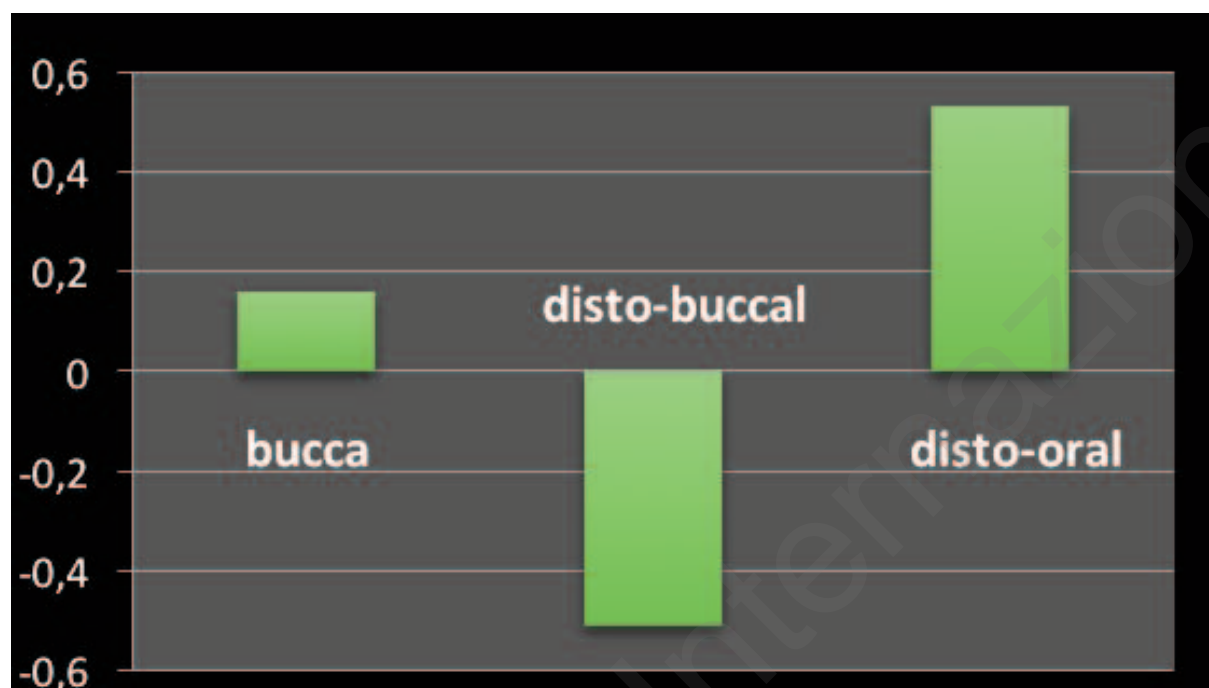


Figure 5
The loss of attachment of the sites around the second lower molar.

Discussion

In all our study population of 150 patients with surgical lower third molar extraction no intraoperative incidents and complications took place (except one fracture of a “long shank cylinder crosscut” bur, which had been taken up from the alveolus by means of little forceps) and each patient was compliant and cooperative during the surgery and checks.

As regards the Plaque Indexes, as a matter of fact, no statistically significant differences have been shown during the different study checks (preoperatorial, 10th, 17th/20th and 90th day) (6, 7). The periodontal recovery has been shown by the probing values, which were on the average better than the starting ones (8). Figure 5 shows the loss of attachment of the sites around the second lower molar. The real loss of attachment was very slight: 0.16 mm of recovery in the buccal probing site; a loss of 0.51 mm on the disto-buccal one; a gain of 0.53 mm in the disto-oral

site (Figure 5). The cases operated by means of flap A have recovered with no long-term complications, while two cases operated one by means of flap B and one by flap C showed a 0.5 mm gingival recession on the buccal face of the second molar (3). All the adverse reactions have occurred within six weeks from the surgical treatment, and each one had no serious significance. The most significant complication was one gingival hypertrophy which had to be later treated (9-11).

Conclusion

Our work wanted to analyze the surgical extraction features and the periodontal recovery quality on the second molar next to the operated area, comparing 3 flap design techniques. The results have been encouraging. No intraoperative incidents happened, the complete recovery of the periodontium around the second molar has been

shown in each patient and each adverse reaction happened within the 4 week after surgery. However these adverse reactions have been slight and have not caused any problems after 90 days from surgery. The adjacent second molar did not show any damage on its hard tissue and periodontium (except 2 slight gingivals recessions 0,5 mm). We can conclude that the impacted third molar surgery is an operation that, if rightly programmed and performed, is relatively safe. Moreover, the correct handling and management of periodontium around the second molar and the choice of the flap type to be used, support a correct recovery on the second molar parodontium, avoiding any long-term damage.

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