

COMPARASION OF OCHSENBEIN LUEBKE FLAP AND TRAPEZOIDAL FLAP IN PERIAPICAL SURGERIES: AN ORIGINAL RESEARCH**Dr. Anand Mangalgi¹, Dr. Kundan Shah^{2*}, Dr. Saraswati F.K.³, Dr. Deepika Mallasure⁴ and Dr. Nitin Thakur⁵**^{1,5}Reader, Department of Oral and Maxillofacial Surgery, HKES S N Dental College, Gulbarga.²Senior Resident, Department of Dentistry, Jawaharlal Nehru Medical College and Hospital, Bhagalpur.³Reader, Department of Oral Medicine and Radiology, HKES S N Dental College, Gulbarga.⁴BDS, Private Practioner.***Corresponding Author: Dr. Kundan Shah**

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Article Received on 19/01/2019

Article Revised on 09/02/2019

Article Accepted on 02/03/2019

ABSTRACT

Background and objective: Periapical surgery has become an integral part of comprehensive oral interdent for oral and maxillofacial surgeons and endodontist. While performing maxillofacial surgeries, the biological and functional health of the peridontium and its esthetic harmony are usually ignored. To restore the health of the of the periodontium and also to maintain and effective balance along with a satisfactory eradication of periapical pathosis various flap designs have been praticeted with a varying degree of benefits.in this present study various types have been compred in terms of their efficacy. **Methods:** For this study patients reporting of the opd department of oral and maxillofacial surgery at our institution were surveyed and a total of 20 patients under asa 1 category within the age group of 12-40 years with periapical pathologies in relation to maxillary or mandibular nonvital anterior teeth indicated for periapical surgery were selected and divided in to two equal groups that is group 1 (O L flap)and group 2 (TZ flap) all the subjects were free of periodontal disease. **Result:** Demographic variables were found to be stastically similar. Though O L flap has certain limitations that it cannot be used. When width of attach gingiva is less in anterior segments especially in mandibular region and posterior segments of both upper and lower jaws. It was found to be better than T Z flap, when comparison was done with respect to time of flap reflection accessibity durartion of surgery and postop pain. Postoperative scarring was noted in two patients of OL and TZ flap group and 2 patients had gingival recession in the TZ flap group as a sequels. Though the respective complications could be encountered with both the flaps. The OL and TZ flaps could be considered as reliable for periradicular surgeries while at comparison in our study result favoured OL flap.

KEYWORDS: Periapical Surgery, Flap Design, Esthetics.**INTRODUCTION**

The ultimate goal for treating periapical surgeries is not only eradication of periapical pathosis but also preservation of periodontal conditions using suitable surgical techniques. Periapical surgery is always a technique-sensitive procedure for oral surgeons and endodontist and they always desire to improve methodology of these procedures by means of instrumentation materials and different approaches to have better success rates. A physical aspect of flap design in adequate to access the area of pathosis. Adequate access enables the endodontist and oral surgeries to see the entire surgical field. A good operative access saves operative time and allows the surgeons to perform the needed surgical trauma and a reduction in post surgical morbidity. Various flap design on the basis of horizontal incision at present having its own merits and demerits.

1. Full mucoperiosteal flaps

- A. Triangular (one vertical releasing incision)
- B. Trapezoidal(two vertical releasing incision with broader base)
- C. Rectangular (two vertical releasing incision)
- D. Horizontal(no vertical releasing incision)

2. Limited mucoperiosteal flaps

- A. Submarginal curved(semilunar)
- B. Submarginal scalloped(OL)

The incision and flap design is one of the important steps in apical surgery. Each type of incision is associated with complication like wound dehiscence, gingival recession and scarring. These complication must be anticipated and incorporated in to pre surgical planning. A good flap design with less esthetic consequences and adequate access will help in minimizing intra operative complications and in improving post operative healing.

In the present study we have compare two flap design that is OL and TZ flaps for cases which were diagnosed with periapical lesions associated with non vital upper and lower anterior teeth and undergoing periapical surgeries.

OBJECTIVES

The aim of our study is to

- 1) To know the incidence of various periapical in male and femal.
- 2) To compare the time of flap reflection with OL and TZ flap.
- 3) To compare the accessibility and visibility with OL and TZ flap in periapical surgeries
- 4) To compare the complete duration of surgery with OL and TZ flap.
- 5) To compare the post operative pain with OL and TZ flap.
- 6) To evaluate post operative complications associated with OL and TZ flaps like gingival recession scarring wound dehiscence and obliteration of sulcus.

MATERIALS AND METHODS

In this study patients were surveyed from following centers:

1. Out patients reporting to Department of oral and maxillofacial surgery, AI-Badar dental college and hospital Gulbarga.
2. Patients reporting to the dental OPD at government hospital.
3. Patients at primary Health center adopted by AI-Badar Dental college and Hospital were also included.

Twenty patients diagnosed with nonvital maxillary or mandibular anterior teeth with associated periapical pathology were divided into two equal groups & Trapezoidal flap was used in one group while ocshenbein-Icubk flap was used for the other group.

Inclusion Criteria

- 1) Co-operation of the patients with the study and postoperative follow up.
- 2) Patients in the age group between 12 year and 40 years.
- 3) Patients under ASA I category.
- 4) Patients with periapical lesions associated with non-vital maxillary or mandibular anteriors teeth.
- 5) Presence of a periradicular lesion that could not be treated by a non surgical procedure.

Exclusion criteria

- 1) Patients below age of 12 years and above 40 years
- 2) Patients suffering from any systemic disease.
- 3) Patients with pre existing periodontal diseases
- 4) Patients with periapical lesions localized to posterior teeth of upper and lower jaws.

Study design

Twenty patients who fulfilled the above criteria were selected for the study and were divided in to two equal groups. Preoperative assessment included detailed history. Clinical examination digital photograph investigation like IOPA radiograph, Routine blood examination like Hachmoglobin, bleeding time, and clotting time for all the patients and occlusal radiographs when ever needed. The study & the associated potential complications were thoroughly explained to all the patients & informed consent was obtained from those who agree to participate.

Procedure

Facial skin preparation was done using savlon & betadine and standard draping procedure was carried out. Intra oral irrigation was done using normal saline with chlorhexidine solution. Local anesthesia was secured with 2% lignocaine hydrochloride and 1:80,000 epinephrine.

Trapezoidal flap involved one horizontal intrasulcular incision and two vertical releasing incision at the line angles of the adjacent teeth and a full thickness flap was raised.

Ocshenbein-Leubke flap involved a one horizontal scalloped incision in the attached gingival following the contour of the marginal gingival above the free gingival groove and two releasing incision placed at the terminal ends of the horizontal incision. Similarly a full thickness flap was raised

After the assessment of root length, bone removal was done using rotatry cutting instrument under copious saline irrigation. The pathological tissue in the periradicular area was removed using a curette and atleast 3mm root was resected close to 45 degree to the long axis of the teeth and the pathological tissue was sent for histopathological examination.

Resected root was examined and root tip was scaled using heat cautery. A wet gauze pack was placed for a few minutes to minimize hematoma and to enhance reattachment of flap to the underlying bone and flap reapproximation was achieved with simple interrupted suture using 3-0 mersilk sutures. A pressure pack was placed for 30 minutes and post surgical instructions were advised.

Postoperative antibiotics prescribed was cap Amoxicillin 500mg three times a day for five days, Metronidazole 400 mg three times a day for five days and NSAID were prescribed and chlorhexidine mouth wash were advised to use after 24 hours of surgery.

Telephonic communication was made for further supportive care.

Duration from the nick of incision to complete flap reflection & complete duration of study till the last suture were recorded using stop watch.

Follow up

Postoperative evaluation was done at 24 hours, 3 days, 7 days, 15 days and one month. It included healing tenderness of teeth to percussion, tenderness of the adjacent tissues to palpation, presence of sinus tract, tooth mobility, gingival recession, scarring wound dehiscence and obliteration of sulcus. Digital photograph were taken at every recall session to document any complication related to both flaps and evaluation with preoperative images. Radiographic evaluation was done with one month post operative IOPA radiograph.

Method of statistical analysis

The data were collected on forms and entered into a Microsoft Excel Worksheet and analysed using SPSS(ver7.5) statistical package.

1. Proportion were compared using Chi-square (χ^2) test of significance. Proportion of cases belonging to specific group of parameter or having a particular problem was expressed in absolute number and percentage.
2. The result were average (mean + standard deviation) for each parameter between the group. Student's *t*-test was used to find a significant difference between the two means.

In all above test "p" value of less than 0.05 was accepted as indicating statistical significance.

RESULTS

Demographic variables were found to be statically similar. Though O L flap has certain limitations that it cannot be used. When width of attach gingiva is less in anterior segments especially in mandibular region and posterior segments of both upper and lower jaws. It was found to be better than T Z flap, when comparison was done with respect to time of flap reflection accessibility duration of surgery and postop pain. Postoperative scarring was noted in two patients of OL and TZ flap group and 2 patients had gingival recession in the TZ flap group as a sequels. Though the respective complications could be encountered with both the flaps. The OL and TZ flaps could be considered as reliable for periradicular surgeries while at comparison in our study result favoured OL flap

Table 1: Age wise distribution of both flaps.

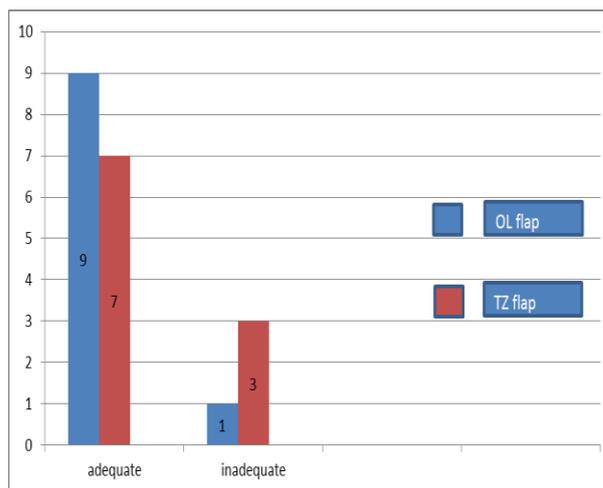
Age group	OL flaps	TZ flaps
12-18	6	3
19-24	4	4
25-40	0	3
Total	10	10

Table 2: Sex wise distribution of both flaps.

Sex group	OL flaps	TZ flaps
Male	3	6
Female	7	4
Total	10	10

Table 3: Time of flap reflection.

Group	5-10 min	>10 min	Total
OLF	8	2	10
TZF	5	5	10
Total	13	7	20



Graph 1: Accessibility and Visibility.

DISCUSSION

Periapical surgery is commonly performed in Oral & Maxillofacial surgical practice. A proper surgical plan is important for the selection of flap design, adequate exposure of field, ease in surgery & finally good clouser resulting in good healing.

A variety of flaps have been employed for access & in ealier day's Trapezoidal flap favoured a lot owing to satisfactory visibility, easy suturing & tissue handling. Since the introduction of OL flap, the approximation of flap back in its original position, maintaining the interdental attachment & prevention of recession of gingival after healing has been successful overcome.

Our study aimed at comparing the efficacy of OL & TZ flap.

The age group considered in our study was between 12-40 years with average of 17.9 in OL flap group and 22.3 in TZ flap group and most of the patients belong to age group of 12-24 years. A similar study by Iram M and et al, in the year 2003 in their study most of the patients were in the age group 12-25 years. The overall male female ratio in our study was 1:1.2 and in similar study by Iram M et al the overall male female ratio was 5:4

Of the various parameters which we have used to compare OL & TZ flap, duration of flap reflection was considered as very significant & OL flap is highly

favoured over TZ flap because in 80% of the patient of the former group the duration was less 10mins. While in only 50% of patient of the latter. Our results are almost coinciding with Iram M et al, study were they found duration required to reflect an OL flag takes less than 10 mins which was found true in more than 60% of their sample². This extra time consumption was due to reflection of interdental papilla and attached gingival. Where as in OL flag it is not difficult to reflect the horizontal and vertical portion of flag as the portion is below attached gingival.

The outcome of any surgical procedure depends; upon the extent to which an adequate access is possible and many endodontic surgical failures have been directed to poor visibility good access and visibility of the surgical field is one of the principle requirements of periapical surgery and the manipulation of the soft tissues must be performed without compromising the requirements for optimal access to the periapical region and perfect visibility of the involved apical structures by Velvart p. Et al. In another study by David & et al, (1982) stated that adequate access to the surgical area of pathosis is the physical aspect of the flap design. In our study the accessibility and visibility was divided in two groups that is adequate and inadequate, among the groups is not stastically significant. A flag was defined as adequate when it enable an easy reflection with minimal or no trauma to the adjacent tissue, and unhindered and complete visualization of the operation site thus allowing an efficient sectioning of the diseased part of the root. Although the result of comparison were statistically insignificant; OL flap group was found to be adequate in 9 pts while in 5 pts of the TZ flap group in a similar study visibility was assessed by the operators personal experience during holding of flap by assistant, facilitation of visibility during cutting bone and assiatance in lip retraction and they found that easy lip retraction better visibility & ease during cutting of bone by Iram M & et al, (2003) it was noted that ol flap is much better in all the respects.

And OL flap again performed better than TZ flap. During of surgery was found to be relatively more in TZ flap for which the attributable reasons could be difficult in reflection of interdental papilla and attach gingival, difficulty in adaptation of interdental papilla and also wound clouser.

In another study David L Vreeland stated that proper alignment of flap is necessary for good aesthetic and it is not easy achieved with TZ flap. While in OL flap reapproximation of flap and wound clouser is easily achieved. Velvart p et al, found that suturing and repositioning of the tissues is relatively easy in TZ flap because of the definite position of the papillae during tissue re-approximation.

At comparison of the total hourly pain scores up to 12 hours using VAS, revealed that OL flap when used for

periapical surgeries resulted in lesser degree of pain than when a TZ flap is used. Similarly M Del Febbo et al noted a comparatively higher degree of pain with the usage of intrasulcular incision when compared against papilla base Incision and in Miguel penarrocha et al study on 62 patients who underwent periapical surgery and they found that pain was greater when treating anterior teeth with trapezoidal incision, pain increasing with the number of teeth and with the duration of surgery.

Higher pain scores in Tz flap group may be due to excessive tissue manipulation as against in the OL flaps severing of the gingival fibers, a comparatively excessive exposure of bone. Apart from from above mentioned reasons smoking can also be responsible for higher degree of pain, since in 2 patients of the TZ flap group who smoked in the post operative period against medical advice, highest pain score were recorded.

Esthetic compromlises as gingival recession, clinical attachment loss are considered as critically by many patients. The aim of the soft tissue management in apical surgery is to prevent loss of attachment of marginal periodontium especially when healthy periodontal condition is present.

Gingival recession (GR) can be defined as the exposure of the root surface caused by an apical shift in the gingival margin.

In 1991 Harrison & Jurosky speculated that reason for gingival recession could be secondary due to excessive force on marginal tissues during flap elevation exposure of marginal bone tissues for 45-90 mins with possible tissue dehydration and bone remodelling during healing. In our study gingival recession was observed in 2 patients of TZ flap & result was considered statistically insignificant respective to age & sex. One male patient age of 40 years and another female patient age 21 years. In comparison greater amount of tissue loss was observed in the male patient for whom an adverse habit of smoking could be considered as a relevant reason.

Chindia M et al conducted a study to compare between semilunar flap and trapezoidal flap on 20 patients age between 16-44 and they found no loss of attachment in both flaps. However in velvart p, et study conducted of comparison of the long papilla healing following sulcular full thickness flap and papilla base flap in endodontic surgery it was found that the papilla Base Incision allows a predictable recession free healing of the interdental papillac and in contrast a mark of loss of papilla height with complete mobilization of the papilla. In spite of using microsurgical procedures which are a promising alternative in overcoming gingival recession due to inadvertent tissue manipulation. Zimmermon et al observed a same complication associated with intrasulcular incision. They proposed that during the complete mobilization of the papilla the most coronal is

frequently served from the body of the papilla and these fragments owing to their small size frequently necrotize thus resulting in loss.

In one more study Velvart, P& et al, (2005) observed that gingival recession may not be solely due to the kind of incision used that is intra-sulcular incision, but it could be due to size of scalpel and blade, needle size, type of suture material, number of sutures placed and day of suture removal may also increase in gingival recession. In our study gingival recession was noted in two patients of TZ flap group although we used small size of scalpel, blade, and needle size, suture material and day for suture removal was done on seventh postop day for all 20 patients.

Treatment of a soft tissue with adequate surgical techniques and maintenance of a healthy appearance especially on the aesthetic zone is a primary concern of the patients.

Scarring has been defined as macroscopic disturbance of the normal structure and function of the mucosa architecture, resulting from the end product of wound healed.

No correlation was found between ages and scarring. Wound healing in the dermins of aged individual has been reported to occur with minimal scarring and delayed inflammatory responses. The phenomenon of better scar quality with aging may be related to the increased information of type III collagen occur time.

T von Arx et al, conducted a study to assess the scarring of gingival and alveolar mucosa following apical surgery with three incision that is submarginal incision, papilla base incision and intrasulcular incision on 72 cases in the anterior maxilla and they have correlated the changes in scarring of gingival with surgical parameters like age, gender, smoking, biotype, antibiotics, incision flap, duration of surgery, suture removal. In our study gingival scarring was documented in 2 patients, coincidentally significant amount of scarring was evident of 2 patients of OL flap group in whom the duration of surgery was highest i.e. 55 and 54 mins respectively.

All the 20 patients were recalled on the 7th day and sutures were removed. At I month appreciable scar was evident in 2 patients of OL flap group. In our study 2 females & the age range was 12-40 no male patients were reported with scarring wound healing in the dermis of aged individuals has been reported with minimal scarring. Female patients had a tendency towards more substantial scarring of gingival (10%) and males (3.1%) but this difference was not statistically significant healing mechanisms in females might be due to hormonal modulation from those in males. In our study we found scarring in 2 female patients and the age was 12 and 24 years may be due to different healing mechanism and no male pt was reported with scarring.

In one more study by Chindia M, and et al, they also found less scarring with trapezoidal incision compare with a submarginal incision. And similar study by kramper BJ, and et al, (1984) reported an experimental dog study and evaluated three commonly used incision and found very little or no scar was evident with intrasulcular incision and scarring was quit evident with submarginal and semilunar incision. And in our study no scarring was evident in trapezoidal flap group and two patients of OL flap were evident with scar.

All the flaps for apioectomy have their own merits and demerits. It is often difficult to select an entirely satisfactory approach. OL flap have the intention of maintaining the attachment level and avoiding postoperative recession after surgical endodontic therapy. The OL flap has given better advantage over all parameters when compared with TZ flap.

CONCLUSION

Gingival recession can result in the exposure of cement Enamel Junction and the root thus resulting in esthetic compromise, which is more pronounced in those teeth with a full crown restoration. Advantage of TZ flap is the possibility of extending the incision for a wider exposure of the operating field. But OL flap is more preferred to overcome the above mentioned complication.

With the present sample size we conclude that both OL & TZ flap can be used for periapical surgeries with a overall satisfactory outcome; though at comparison in the study, the OL flap has been found to be better than TZ flap. In extensive crown and bridge work OL flap has got an added advantage as there is no exposure of the restorative margins by avoiding the exposure of crown since there is no postoperative recession after surgical endodontic therapy.

SUMMARY

The success of periradicular surgeries not only depends upon a satisfactory eradication of the pathology but also on achieving an esthetic harmony of the periodontal tissues. There are various flap design used for the approach to the periapical pathosis, each flap design is associated with its own inherent advantages and disadvantages. This study was conducted in order to compare the outcome of two flap design that is OL & TZ flap and this study variables were time of flap reflection, accessibility, duration of surgery, postoperative pain and post operative complication.

The study was conducted on 20 patients who were diagnosed with nonvital maxillary or mandibular anterior teeth with associated periapical pathology undergoing apioectomy under local anesthesia and the patients were divided into two equal group in the Dept. Of Oral and maxillofacial surgery AI-Badar Rural Dental College & Hospital.

OL flap was found to be better when compared to TZ flap with respect to time of flap reflection and duration of surgery. Accessibility and visibility were adequate with usage of both flaps; but statically OL was found to be more promising than TZ flap. Patients in the OL flap group were relatively more pain free though at statistically comparison a significant difference was not found.

At one month follow up GR was evident in two patients of the TZ flap group and two patients of OL flap group. All the four patients are routinely followed and the complications have been found to be clinically mild without any need or intervention.

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