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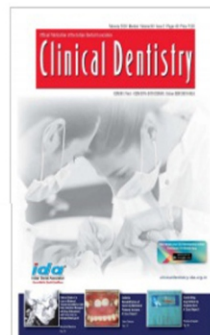
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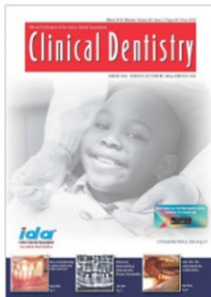
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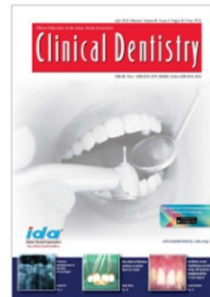
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Dr. A.L. Meenakshi Sundaram

I feel happy to interact with you all through this 4th and last issue of JIDAT of the year 2018.

JIDAT has energised the academic activities of IDA, TN and hope the members to use this journal to publish and replenish our knowledge with new ideas and techniques.

JIDAT is getting better with every edition with all your support.

I owe a huge thanks to Dr. Musthafa, editor of JIDAT for his stupendous work and responsibility.

Hope the members are benefited by this journal and request your continuous support and unity.

Wish you all a very happy New Year 2019.

Thank you

Yours sincerely,

Dr. A.L. Meenakshi Sundaram

Hon-State President

IDA-Tamilnadu State Branch



Dr. K.P. Senthamarai Kannan

Dear Members,

Warm Regards from IDA Tamilnadu State Branch.

At the outset, I would like to congratulate editor in chief Dr. Mohamed Musthafa for his dedicated work towards our state journal "JIDAT". The Journal of our association would also continue to open up newer avenues in research and presentation of scientific ideas to our fraternity. With continuous inputs and contributions from the fraternity, our journal can become better and better with time with a good impact factor.

On behalf of IDA Taminadu state branch we expect contributions from all the members to make this journal more success.

Best wishes for editor and his team

With Regards,



Dr. K.P. Senthamarai Kannan
Hon-State Secretary
IDA-Tamilnadu State Branch



Dr. H. Mohammed Musthafa

Warm wishes,

Its my pleasure to meet you all through this issue.

As Osler Says,

“He who studies medicine without books sails an uncharted sea, but he who studies medicine without patients does not goes to sea at all”

JIDAT serves as a platform to the dentists to learn varied patients, their complaints and the way they have been managed by proper evidence based methods.

The success of JIDAT lies only in the hands of our Members. Your contribution and continued reading of JIDAT will help you impart knowledge and acquire skills, which is the need of the hour.

My sincere thanks to the IDA Tamilnadu state office for their enormous support and hope the same continues in coming years.

JAI IDA!!!

A handwritten signature in black ink, appearing to read 'Dr. H. Mohammed Musthafa'.

Dr.H.Mohammed Musthafa,
Editor in Chief,

Greetings



*Prof. Dr. A. Thangavelu. M.D.S., D.N.B., FIBOMS
Past Editor – JIDAT*

" It is not the years in your life, but the life in your years that counts"
- Adalie Stevenson

Today's dental graduates are entering into the work environment with the greater clinical knowledge base than ever before. The amount of scientific information necessary for the current general dentist, who wish to practice comprehensive general dentistry is staggering and forever increasing. Given the previously stated remarks, it often seems that other areas of knowledge that are almost as important for developing a successful clinical practice are sometimes overlooked or given short shrift by general dentist and dental specialist alike.

In spite of all developments and updates, still the dentists are considered not less than a mechanic in our medical profession. More concentration is absolutely necessary for each and every young dentist to have a very strong scientific knowledge and basic skills on general health, management of medical emergencies at dental office or any other life saving measures in the dental office.

As a maxillofacial surgeon, I wish our dental degree is not less than the medical degree provided, be equipped ourselves to face the challenges associated with the medical concerns of our patient. To emphasize a quick analysis of various systems, identification of the problems, subjecting to necessary investigations, confirming with a fitness from the specialty of interest will boy on up our general dental practice. Not only for ethical reasons but also for the status challenge, we need to be more scientific than mechanic. My dear friends, let us be proud that we have 32 organs..!!

Thank u . . .!!!

HARD TISSUE LASER USED IN IMPACTION : REVIEW OF LITERATURE

Kavin T, Narendar R**, Indra Kumar SP***, Tamil Thangam P***, Kaviyah V*****

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Department of Oral Surgery, Vivekananda Dental College for Women.

ABSTRACT

OBJECTIVES:

The purpose of present article is to review removal Impacted mandibular third molar extraction by using laser and bur and its possible complications and extraction difficulty based on degree of classification and its anatomical and radiologic findings and literature review results.

MATERIALS USED:

Literature was selected through a search of PubMed and Articles. The keywords used for search were mandibular third molar, impacted mandibular third molar, inferior alveolar nerve injury third molar, lingual nerve injury. Additionally a manual search in the major anatomy and oral surgery journals and books is performed.

INTRODUCTION:

During the past two decades, lasers has been widely used in many medical specialties, including general surgery, ophthalmology, and dermatology. In oral and maxillofacial surgery their clinical application has largely been restricted to soft tissue. Initially ruby and long pulse CO2 laser are used for cutting mineralized tissues but results revealed serious biological complications, thermal damage, 1,2 severe carbonization effects and delayed bone healing. Later comprehensive advancements of short-pulsed infrared laser systems paved the way for successful ablation of dental hard substances and bone. Our study was to assess the feasibility of Er: YAG laser in bone cutting for removal of impacted lower third molar teeth and compare its outcomes with that of surgical bur.

Laser vs bur for bone cutting in impacted mandibular third molar surgery: A randomized

controlled trial

Observation of clinical parameter like pain bleeding and swelling are lower in laser group than bur group. Sample size: 40 (20 for laser group and 20 for bur group) Laser group required almost double the time taken for bone cutting with bur. Trismus persisted for a longer period in laser group. Wound healing and complications are assessed clinically and there was no significant difference in both the groups. [1]

Basic study on vibration during tooth preparation caused by high speed drilling and Er:YAG laser irradiation:

An Er:YAG laser effectively removes dental hard substances and causes less pain during tooth preparation than high speed drilling. [2]

Bone healing after bur and Er:YAG laser osteotomies:

Martins GL, Puricelli E, baraldi CE: proof that osteotomies performed by different methods are often necessary in Oral

Maxillofacial surgery, rotatory and reciprocating are more frequently used but have disadvantages such as noise, vibration and thermal damage laser systems are interesting alternatives procedure. Laserosteomies resulted in thin layer of thermal damages compare to the bur.[3]

Use of the Er:YAG laser for improved plating in oral maxillofacial surgery comparison of bone healing in laser and drill osteotomies:

Lewandrowski, Lorents, Schomacker, Flotter: says that for bony stabilisation during hole drilling is often challenging due to apply pressure when using a conventional mechanical hand drill, this leads to complications in reconstruction by using pulsed Er:YAG offers an attractive alternative drilling modality because it does not require physical contact with the bone in order to drill holes and cut bone but with minimal thermal changes.[4]

Er:YAG laser osteotomy for removal of impacted teeth; clinical comparison of two techniques:

Stillbinger: By using saws and drill compared to the modulated ultrasound laser often the non-contact and low vibration bone cutting. Observation and study with 30 patients using fiber-optic delivery system which shows good clinical results without any impairment to wound healing.[5]

Bacteriostatic effect of Er:YAG laser on periodontopathic bacteria:

Ando; Aoki.A: This study examined the bactericidal effect of Er:YAG laser in periodontopathic bacteria in vitro. Growth inhibitory zones were found at the irradiated sites at the energy of about 0.3 J/cm² and higher but the survival ratios of the viable bacteria is 10.6 J/cm² so that it

controlled the growth of bacteria. These findings suggest that Er:YAG laser has high bactericidal potential at a low energy level.[6]

Removal of partially erupted third molar using an Er:YAG Laser a randomised controlled clinical trial:

Abu-serriah, Whittersc.j: Compared Erbium-YAG laser with surgical bur for removal of partially erupted lower third molar, a total of 42 patients (laser:22, bur:20) were treated. It showed a greater reduction of range of mouth opening was found after laser than bur treatment. Postoperative pain was common after bur treatment. The duration of operation was considerably longer with laser than with bur. No persistent complications were encountered.[7]

Effects of the carbon dioxide surgical laser on oral tissue:

Fisher SE, Frame JW: The carbon dioxide laser has become more widely available in surgery. Its acute biological effect on oral tissue is so fast that healing of oral wounds and carbon dioxide laser in the management of oral mucosal diseases.[8]

Thermological study of drilling bone tissue with a high-speed drill:

Konodo S, Okada Y: To perform a detailed quantitative analysis of the effect of intermittent drilling and irrigation to lower the temperature during high speed drilling, after cold irrigation can minimize temperature elevation, the substantial effect on nerves or other structures needs to be elucidated.[9]

RESULTS:

In total 9 literature sources were obtained and reviewed. Impacted mandibular third molar aetiology, clinical anatomy, radiographic examination, surgical extraction and its possible complications using laser and bur were discussed.

CONCLUSION:

Based on the results of our study, the possibility of bone cutting using lasers is pursued, the osteotomy is easily performed and the technique is better suited to minimally invasive surgical procedures. The use of Er: YAG laser may be considered as an alternative tool to surgical bur, specially in anxious patients.

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A method of extraction of impacted maxillary upper supernumerary tooth : A Technical Note

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Tiruchengode, Tamil Nadu, India*

ABSTRACT

OBJECTIVES:

The purpose of present article is to review removal Impacted mandibular third molar extraction by using laser and bur and its possible complications and extraction difficulty based on degree of classification and its anatomical and radiologic findings and literature review results.

MATERIALS USED:

Literature was selected through a search of PubMed and Articles. The keywords used for search were mandibular third molar, impacted mandibular third molar, inferior alveolar nerve injury third molar, lingual nerve injury. Additionally a manual search in the major anatomy and oral surgery journals and books is performed.

INTRODUCTION:

Surgical removal of impacted teeth can be either **u n e v e n t f u l** and uncomplicated, or it can be difficult, with considerable morbidity¹

posterior supernumerary tooth situated lingually/ palatally or buccally to a molar or premolar teeth is termed as paramolar.: fully developed teeth with roots adjacent to, or into the maxillary sinus wall need to be extracted for orthodontic reasons²

Impacted maxillary supernumerary teeth are more common, . The impacted supernumerary teeth are usual located between the existing usual series of teeth so they are between the roots of the roots of the existing teeth and are in an inaccessible to apply force, luxation of adjacent tooth is also possible while using elevators, removal of impacted supernumerary maxillary teeth will also cause oro antral communication because of approximation of

maxillary sinus .

we introduce a simple and effective technique. To avoid complications with the surgical procedures. Surgical procedure we used backside of the bur to remove the impacted teeth.

Case 1

The root configuration were assessed radiographically, which revealed that the tooth is single rooted , root doesn't have any dilaceration or abnormal configuration.

To carry out the procedure in a painless manner topical local anesthesia is applied then lignocaine with 1:80000 adrenaline was given as buccal infiltration and greater Palatine nerve block . Once the subjective and objective signs are confirmed , a muco periosteal flap is raised palatally in relation to 24 and 25, impacted tooth was exposed Then using micromotor stright hand piece and 702 TC bur, bone guttering was done palatally and a hole 5–7mm deep is drilled into the occlusal

surface of impacted supernumerary teeth(fig:1), and backside of another bur was engaged into the prepared cavity and the fit was firm(fig 2), So that while moving the sank of the bur, the impacted tooth also luxated along with the bur shank and tooth was removed (fig 3), wound toileting done, closure done with 3-0 blacksilk and the healing was uneventful.

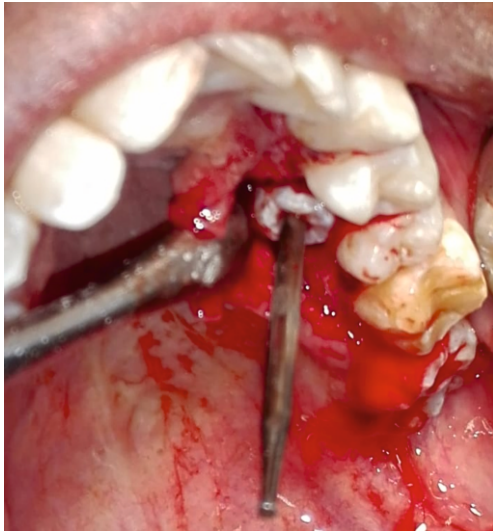


fig 1- A cavity prepared in the occlusal surface of impacted supernumerary teeth

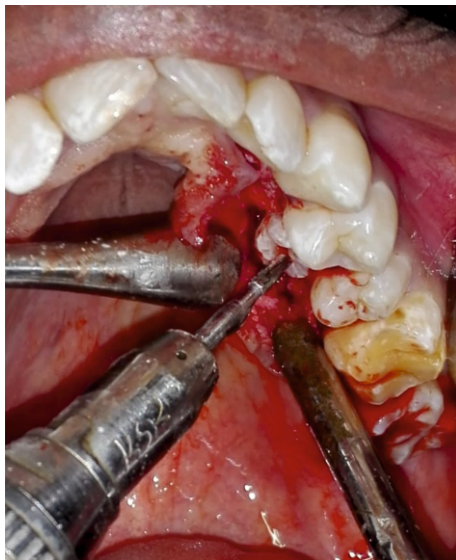


Fig 2 Bur was engaged into the prepared cavity

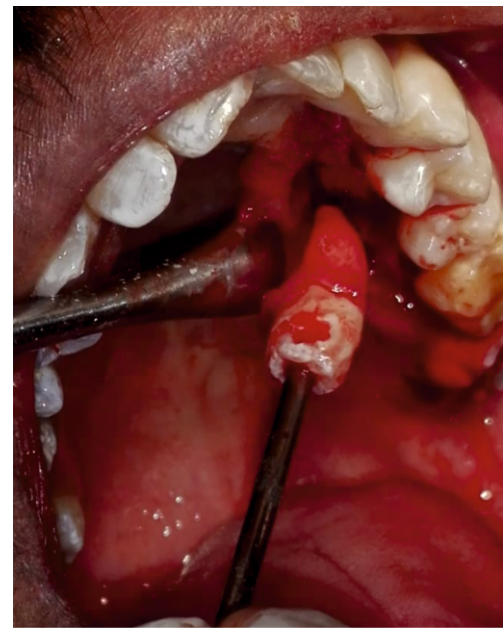


fig 3 the impacted tooth luxated along with the bur

Case 2

A imacted para molar in relation to lingual aspect of 36 and 37 in which , a muco periosteal flap is raised lingually in relation to 36 and 37, impacted tooth was exposed Then using micromotor stright hand piece and 702 TC bur, a cavity was prepared in the occlusal surface of impacted supernumerary teeth(fig:4), and backside of the bur was engaged into the prepared cavity and the fit was firm(fig 5), tooth luxated using bur attached to the tooth and tooth was removed (fig 6), wound toileting done, closure done with 3-0 blacksilk and the healing was uneventful.



fig 4 - a cavity was prepared in the occlusal surface of impacted supernumerary teeth



fig 5-backside of the bur was engaged into the prepared cavity and the fit was firm



fig 6- tooth extracted using bur

Discussion

Geoffrey L Howe³ stated that 'when an instanding premolar is more deeply embedded, a lingual muco periosteal flap is rised and lingual bone is removed to expose the maximum convexity of the crown. The buccal mucoperioseal flap is raised and any bone covering the crown removed. If the line of withdrawal of the tooth permits, the tooth is elevated from its socket by the use of either distal or buccal application of force. The so called 'broken instrument' technique is a useful way of applying force to such a tooth from the buccal side'.³

Papadogeorgakis et al⁴ proposed a technique in which a hole 5–7mm deep is drilled into the enamel–ostein junction with a round bur. The bur is then removed from the hand piece and left in the crown . A suitably shaped instrument such as the grip of a dental mirror with its aperture fully opened, or a solid needle holder,

can then be attached to the free end of the bur and rotated to extract the tooth rapidly and safely

In this method what we proposed in this article, we successfully extracted impacted supernumerary teeth using the bur without delivering forces and damage the associated structures.

Conclusion

This technique is a simple and an easy method of extracting the tooth , especially when the use of forceps is not favorable. Thus , using the bur is found most convenient and quick.

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MUCOUS EXTRAVASATION CYST – A CASE REPORT

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ABSTRACT

Mucocele is a common lesion of the oral mucosa that results from an alteration of minor salivary glands due to a mucus accumulation causing limited swelling. Two histological types exist - extravasation and retention. Clinically they consist of a soft, bluish and transparent cystic swelling. Lower lip is the most common site of occurrence of these lesions in the oral cavity and most probable cause is trauma or habit of lip biting. Diagnosis is mainly clinical due to its pathognomonic presentation. We report a case of mucocele in a 8 year old boy treated by conventional surgical excision.

Keywords: Mucocele, Recurrence, Salivary glands.

INTRODUCTION

Mucocele is defined as a mucus-filled cyst that may appear in the oral cavity, appendix, gall bladder, paranasal sinuses, or lacrimal sac.[1, 2] The term mucocele was derived from a Latin word, Mouco-mucus and coele-cavity.[1,3] Mucocele results from accumulation of mucus due to alteration in the minor salivary glands. Two types of mucocele can appear in the oral cavity, namely, extravasation and retention type. In children, extravasation mucoceles are common and retention type of mucoceles are very rarely found.[4] Extravasation mucocele results from a broken salivary gland duct causing spillage into the soft tissues around the gland. These extravasation mucoceles undergo three evolutionary phases. In the first phase, mucus spills diffusely from the excretory

duct into the connective tissues. In the next phase, i.e., resorption phase, because of foreign body reaction, formation of granuloma occurs. In the final phase, there is formation of pseudocapsule (without epithelial lining) around the mucosa. Blockage of the salivary gland ducts causing decrease or absence of glandular secretion causes retention mucocele.[3,5] Clinical appearance of both extravasation and retention mucoceles are similar.

Mucoceles present as bluish, soft, and translucent cystic swelling, Blue color is due to vascular congestion, cyanosis of the tissue above, and accumulation of fluid below. However, coloration may vary depending on the size of the lesion, proximity to the surface, and elasticity of overlying tissue. Extravasation mucoceles appear frequently on the lower lip followed by the

tongue, buccal mucosa, and palate and are rarely found in the retromolar region and posterior dorsal area of tongue; in contrast, retention mucoceles appear at any site in the oral cavity.[5] When located on the floor of the mouth, these lesions are called ranulas because the inflammation resembles the cheek of a frog.[6] Mucoceles are usually asymptomatic but sometimes can cause discomfort by interfering with speech, chewing, or swallowing. Treatment options include surgical excision, marsupialization, micromarsupialization, cryosurgery, laser vaporization, and laser excision.[3] This article describes a case of mucocele on lower lip treated by surgical excision method using scalpel blade.

CASE REPORT

An 8 year old male child reported to DIAGNOX - Oral Medicine and Radiology Centre, with a swelling in inner aspect of lower lip which was present since 3 months. A detailed history elicited from the accompanying parent showed etiology to be trauma from lip biting. The swelling was initially small which slowly enlarged and attained the present size. Clinical examination revealed the overlying mucosa was normal. Swelling was 1x1 cm in size, soft, fluctuant, palpable and non-tender, placed in the inner aspect of lower lip in relation to 41, 42, 43 (Figure 1A). Based on the chief complaint, history and clinical examination a provisional diagnosis of mucocele was arrived. Routine blood examination was done which was normal and the treatment plan decided was surgical excision of the mucocele. Excision of the mucocele was performed under local

anaesthesia. An incision was placed vertically; therefore splitting the overlying mucosa and separating the lesion from the mucosa (Figure 1B). The Mucocele was resected from the base without rupturing it so that chances of recurrence are less (Figure 1C). Few adjacent minor salivary glands were also removed (Figure 1D). The surgical site was irrigated with saline solution and closed primarily with 3-0 silk sutures. All post-operative instructions were given and analgesics were prescribed. The specimen was placed in 10% formalin and sent for histopathological examination. The histopathology picture is diagnostic of mucus extravasation cyst (Figure 1F). The patient was reviewed after 1 week for suture removal and was doing fine with no discomfort (Figure 1E).

DISCUSSION

The incidence of mucoceles in the general population is 0.4–0.9%. There is no gender predilection.[7] The appearance of mucocele is pathognomonic. Location of lesion, history of trauma, rapid appearance, variation in size, bluish color, and the consistency, history, and clinical findings lead to the diagnosis of superficial mucocele. Lip contains adipose, connective tissue, blood vessels, nerves and salivary glands, and hence, pathology of any of these tissues can produce swelling on the lips. Mucocele, fibroma, lipoma, mucus retention cyst, sialolith, phlebolith, and salivary gland neoplasm appear as swelling on the lip. However, these can be distinguished from mucocele based on their clinical appearance, color, consistency, etiology, and their location of occurrence. Conventional

surgical removal is the most common method used to treat mucocele. Elliptical incision is the most popularly used treatment procedure. This helps to decrease the extent of mucosal tissue loss, decreases the incidence of formation of large fibrous scars, and helps to prevent spilling of the cystic content, which could be responsible for recurrence. To reduce the chance of recurrence, lesion should be removed down to the muscle and damage to the adjacent gland and duct should be avoided while placing the suture. [8] The diode laser can be useful if the lesion contains a vascular area which could result in post treatment hemorrhage. Fibrotic lesions or lesions which do not contain any pigment may be more effectively removed using the Erbium laser. Small mucocele can be removed with marginal glandular tissue but in case of large mucocele marsupialization can be done to prevent damage to vital structures. [9] Recurrence can be avoided by removing adjacent surrounding glandular acini and removing the lesion down to the muscle layer.

CONCLUSION

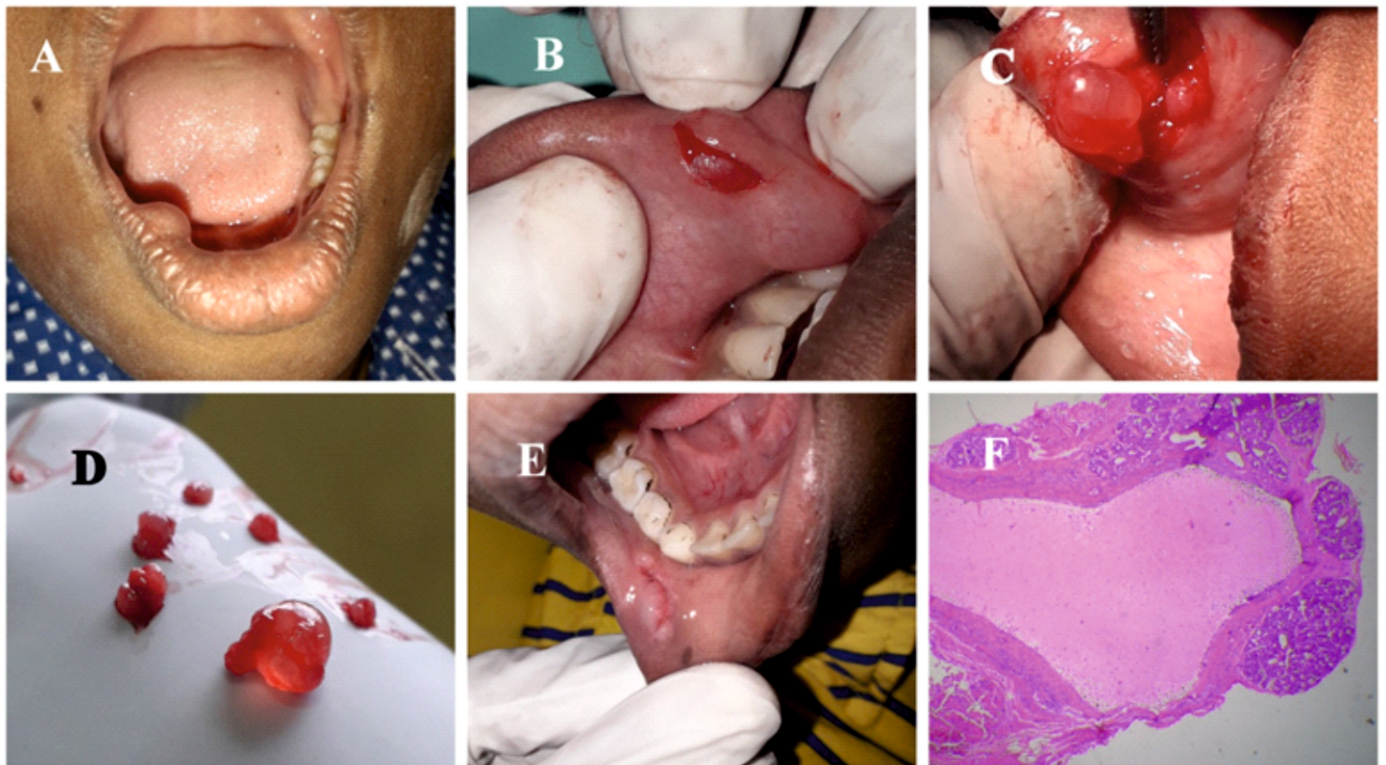
Mucocele are one of the most common soft tissue lesions of the oral cavity which cause distress and discomfort to the patient. Because of high chances of recurrence, management of mucocele is a challenging task. Even though there are many advanced treatment modalities, simple excision with care is the most effective way to treat mucocele. Surgical excision with dissection of surrounding and contributing minor salivary gland acini with care proved to be successful with least possible recurrence.

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- A) Clinical photograph showing mucocele on the lower lip. B) Elliptical Incision on the superficial surface of mucocele C) Excision of Complete mucocele without rupture D) Excised mucocele along with adjacent minor salivary gland E) Follow up after 1 week F) Photomicrograph of the excised Mucocele

SOCKET SHIELD TECHNIQUE-A REVIEW

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ABSTRACT

Healing of extraction socket is a dynamic process with formation of bone into socket along with loss of ridge width and height externally. This resorption pattern seen more pronounced in the buccal/labial aspect of extracted teeth as there is a loss of bundle bone-periodontal ligament (BB-PDL) complex compared with the palatal aspect. This clinical situation always pose a nightmare for the treating implant dentist as the loss may affect the aesthetic outcome in the anterior. In order to prevent this loss, several options were practical and one among the latest technique is SOCKET SHIELD TECHNIQUE (SST). In this technique, a segment of root is retained as a shield, which aids in prevention of BB-PDL complex on buccal aspect of the socket. This article reviews the effectiveness of SST, basic procedure, selection criteria and histological aspects of socket shield technique.

KEYWORDS: tooth extraction, bundle bone, socket shield and immediate implant.

Introduction

When a tooth or multiple teeth are lost, the socket and surrounding tissues undergo significant changes in either horizontal and vertical dimensions or both. This change i.e. resorption is seen more on the buccal aspects than the lingual plate¹. As a result, the centre of edentulous site shifted towards the lingual or palatal aspect of the ridge. It is stated in literature and evident that if the distance between the bone plates are <1mm wide, there is substantial buccal bone loss than the buccal plate >1mm². In anterior aesthetic region, it is usually less than 1mm (>80%), leading to pronounced buccal plate collapse leading to an aesthetic disaster. In order to overcome these difficulties various treatment approaches

are available such as socket preservation, ridge augmentation and immediate implant placement. It has been stated in literature that retention of portion of root also prevents the buccal bone loss. Researchers attempted a procedure of retaining the natural tooth apparatus to counteract the remodelling process. Hurzeler et al in 2010³ proposed the socket shield technique provides a promising and alternative approach to maintain the buccal ridge width. This technique serves dual purpose of preservation of periodontium by the retained root segment and immediate implant with functional rehabilitation. This review paper gives an overview of socket shield technique and various steps in this procedure.

DIMENSIONAL CHANGES OF SOCKET

The clinical presentation of sockets after extraction varies from simple to complex. To study these changes, we need to know the classification of extraction defects. The classification of extraction defect4 (table-1) of the socket helps us in better treatment planning and provides guidelines for dental implant placement (fig-1).

<i>Defect type</i>	<i>General assessment</i>	<i>Socket walls affected</i>	<i>Biotype</i>	<i>Hard tissue</i>	<i>Distance to reference</i>	<i>Ideal soft-tissue</i>	<i>Treatment recommendations</i>
EDS-1	Pristine	0	Thick	0 mm	0-3 mm	Predictable	Immediate implant (one-stage)
EDS-2	Pristine to slight damage	0-1	Thin or thick	0-2 mm	3-5 mm	Achievable but not predictable	Site preservation or immediate implant (one- or two-stage)
EDS-3	Moderate damage	1-2	Thin or thick	3-5 mm	6-8 mm	Slight compromise	Site preservation then implant placement (two-stage)
EDS-4	Severe damage	2-3	Thin or thick	≥ 6 mm	≥ 9 mm	Compromised	Site preservation then site development then implant placement (three-stage)

Table 1: EXTRACTION DEFECT SOUNDING CLASSIFICATION

Courtesy: Nicholas Caplanis et al Int.J. Clinical Implant Dentistry April 2009

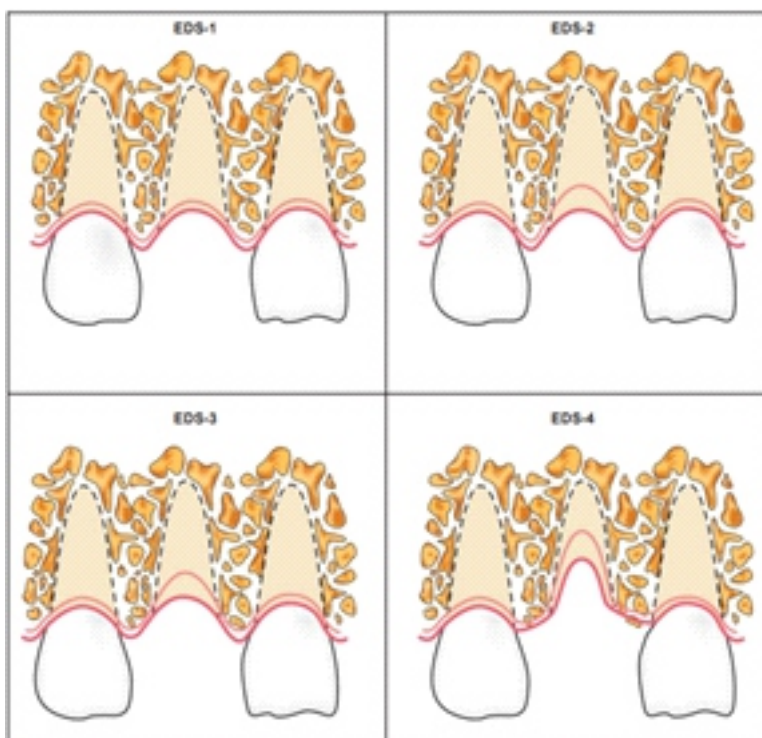


Fig-1: EXTRACTION DEFECT

Based on soft and hard tissue variables, another classification was proposed⁵. (table-2)

1. Soft tissue contour variations
2. Vertical soft tissue deficiency
3. The keratinized gingival (KG) width on the mid-buccal side of the socket

Assessment	Extraction Socket Types		
	Adequate	Compromised	Deficient
Soft tissue			
Quantity			
Soft tissue contour variations	No	<2 mm	≥2 mm
Soft tissue vertical deficiency	No	1 to 2 mm	>2 mm
KG width (mm)	>2	1 to 2	<1
Mesial and distal papillae appearance (Nordland and Tamow ³⁴)	I	II	III
Quality			
Soft tissue color, consistency, and contour	Pink, firm, and smooth	Slightly red and a soft, spongy, and uneven contour	Red/bluish or red with a soft edematous and boggy or craterlike appearance
Biotype			
Biotype of gingival tissue (mm)	Thick (≥2.0)	Moderate (≥1.0 to <2.0)	Thin (<1.0)
Hard tissue			
Height of alveolar process (mm)	>10	>8 to ≤10	≤8
Available bone beyond the apex of extraction socket (mm)	≥4	≥3 to <4	<3
Extraction socket labial plate vertical position (mm)	≤3	>3 to <7	≥7
Extraction socket facial bone thickness (mm)	≥2	≥1 to <2	<1
Presence of socket bone lesions	No	Yes	Yes
Mesial and distal intradental bone peak height (mm)	3 to 4	≥1 to <3	<1
Mesio-distal distance between adjacent teeth (mm)	≥7	>5 to <7	≤5
Need for palatal angulation	<5°	5° to 30°	>30°

Table-2: EXTRACTION SOCKET SOFT AND HARD TISSUE ASSESSMENTS AND EXTRACTION SOCKET TYPES⁵.

Courtesy: Gintaras Juodzbalyis et al, J.Periodontol March 2003.

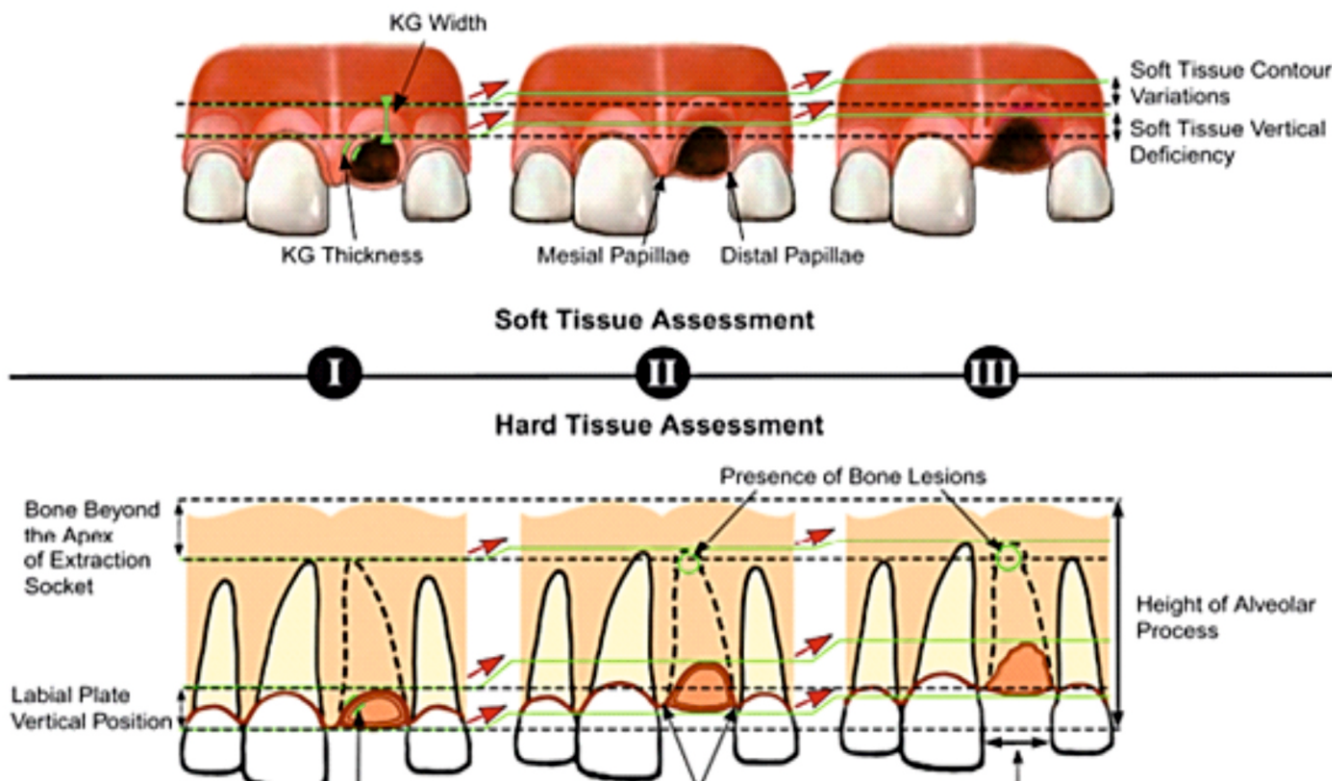


Fig-2: EXTRACTION SOCKET SOFT AND HARD TISSUE ASSESSMENTS AND EXTRACTION SOCKET TYPES6

CLASSIFICATION OF THE EDENTULOUS JAWS6

Following tooth extraction, the edentulous ridge undergo a series of remodelling events that influences the treatment rendered to the patient and interferes with surrounding soft tissue aesthetics.

- Class I - dentate.
- Class II -immediately post extraction.
- Class III- well-rounded ridge form, adequate in height and width.
- Class IV - knife-edge ridge form, adequate in height and inadequate in width.
- Class V flat ridge form, inadequate in height and width.
- Class VI - depressed ridge form, with some basalar loss evident.

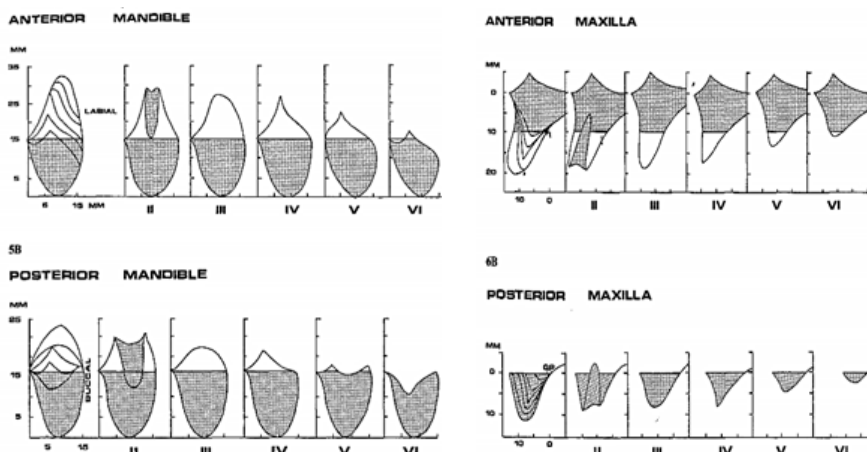


Fig-3: CLASSIFICATION OF THE EDENTULOUS JAWS6

Courtesy: J. L Cawood and R. A. Howell-Int. J. Oral Maxillofac. Surg. 1988

SELECTION CRITERIA FOR SOCKET SHIELD PROCEDURE7.

INDICATIONS:

1. Unrestorable tooth crown or tooth indicated for extraction
2. Tooth root with or without apical pathology
3. Intention to preserve the alveolar ridge, specifically to prevent bucco-palatal collapse
4. Immediate implant placement
5. Ridge preservation in conjunction with other PET

CONTRAINDICATION:

1. Mobility of the tooth root
2. Traumatic occlusion
3. Active periodontitis

MATERIALS REQUIRED8:

1. Long-shank root resection bur
2. Gates-Glidden bur
3. Extra-large round diamond head bur (to reduce the inner aspect of the root segment)
4. End-cutting diamond head bur (to decoronate the tooth)
5. Gingival protector
6. Irrigated surgical motor
7. Contra-angled surgical fast hand piece
8. Microperiostomes
9. Micro forceps
10. Saline for irrigation
11. CBCT of the site

Megagen™ Root membrane Kit is available commercially for precise preparation of the site.

SURGICAL PROCEDURE8-10(Fig-4):

The main principle of this technique is to prepare the part of root of a tooth indicated for extraction in such a manner the buccal/facial root section remains in situ with its physiologic relation to the buccal plate. This retained root section aids in maintenance of the supporting periodontium and prevent the usual remodelling process of the extraction socket i.e. loss of bundle bone-pdl complex.

1. Rinse with Chlorhexidine mouthwash-0.2%
2. Administration of local anaesthesia
3. The crown portion of the indicated tooth resected with a coarse diamond bur. According to Hurzeler³ et al, the level of resection must be at gingival margin (equigingival) and based on Gluckman⁸ et al 2013, it must be below the gingival margin but 1mm above the crest of the ridge.
4. The root sectioned in mesiodistal direction using a long shank diamond bur and palatal portion of the root retrieved carefully without disturbing the buccal portion with periostomes/micro forceps. Tactile sensation from the finger rest helps in identifying the movement in shield and improper sectioning.
5. The buccal portion of the root segment now contoured to the shape of the socket i.e. concave profile of the buccal bone. An extra-large round bur used to shape the root segment to a width of 1.5mm -2mm. Only the coronal portion of the root thinned and apical portion left wider.
6. Hurzeler³ suggested the root must be retained to the full length but Gluckman⁸ suggested only two-third of the root is

sufficient, the apical portion of the root is removed i.e. approximately half its thickness from the root canal to its labial limit.

The goal was to have an implant bed consisting of mesial, distal and palatal intact bony walls, with the buccal wall occupied by the contoured root segment comprised, from inside to outside, of a thin layer of dentin, followed by cementum, periodontal ligament and bundle bone. The contoured root segment forms a shield and now called as "SOCKET SHIELD".

8. In order to obtain primary stability of the implant, the osteotomy preparation is extended 2-3mm apically from the alveolus. The path of implant must be in such a way that implant threads are in proximity with the root segment.
9. The implant placed with speed of 20rpm and 40Ncm torque⁹. The jumping distance from the root and implant should be not more than 1.5-2 mm. If this distance is more, bone graft can be used¹⁰.
10. The temporary abutment was placed and

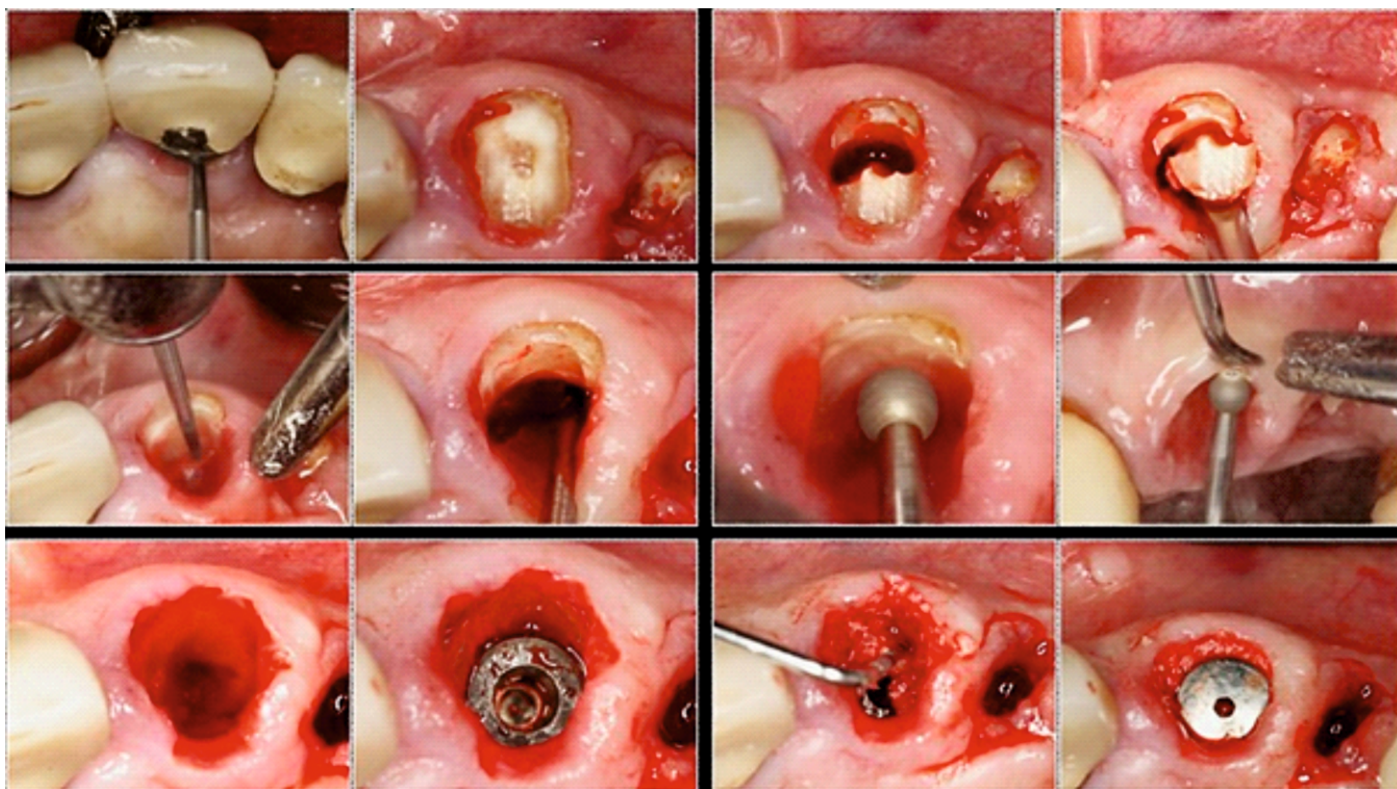


Fig-4: SURGICAL STEPS IN SOCKET SHIELD TECHNIQUE.
Courtesy: Howard Gluckman in 20148.

7. During implant osteotomy preparation, care must be taken to not to damage the shield. Tapered implant selected as it follows the natural contours of the mid- and apical portion of the root and allows the retention of the root segment with adequate thickness¹⁰.

cement retained restoration was fabricated using a routine provisionalization protocol. Care must be taken to remove all centric/eccentric occlusal contacts. Post-operative medication advised and chlorhexidine mouth rinse is advised.

HISTOLOGICAL EVALUATION:

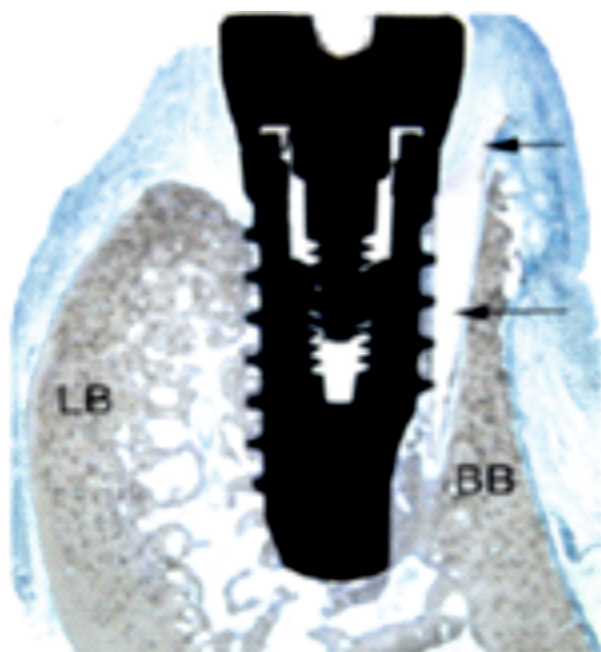


Fig-5: longitudinal histological section

Hurzeler³ studied the histological sections of the specimen under light microscopy and SEM.

The histological evaluation can be explained under two subheadings:

Implants placed lingual to the root fragment³:

The bucco-lingual sections revealed that the root fragment consisted of a small portion of enamel and up to 0.5mm wide piece of root dentin. On its buccal aspect, the root segment was attached to the buccal bone with the physiological periodontal ligament fibres and root cementum. (Fig-5) The implant was osseointegrated with the lingual/palatal bone. The height of the bone crest was identical in both buccal and lingual sides. On higher magnification, a physiological junctional epithelium terminating at the CEJ. Apically, the dentin surface was covered with thin layer of newly formed cementum and thickness increased continuously towards apical direction. The coronal part of cementum was

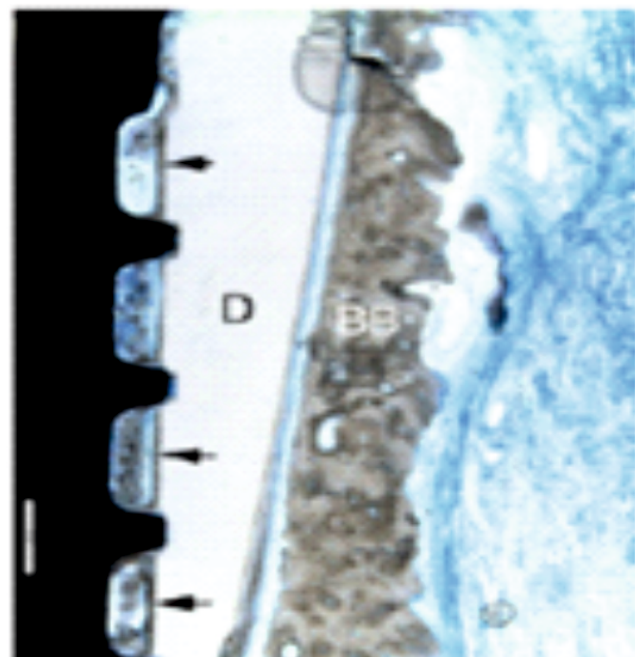


Fig-6: BB-PDL complex

acellular cementum followed by cellular cementum as progressing apically. A cellular cementum showed ongoing cementum formation and presence of collagen fibers. Cellular cementum was deposited in multiple layers. Backscatter SEM showed cementum firmly attached with the root dentin. The apical end of the root fragment showed no resorption processes. The buccal part showed intact periodontal ligament (fig-6). The alveolar ridge showed no resorption process. The histomorphometrical evaluation showed a bone to implant contact of 76.2%¹¹.

Implants placed in contact to a tooth fragment³:

The implant – tooth interface in the coronal part showed connective tissue interposed between them. Physiological junctional epithelium and new cementum formation observed. The implant threads that were in direct contact with the tooth fragment showed cellular cementum formation. Formation of new cementum via cementoblast

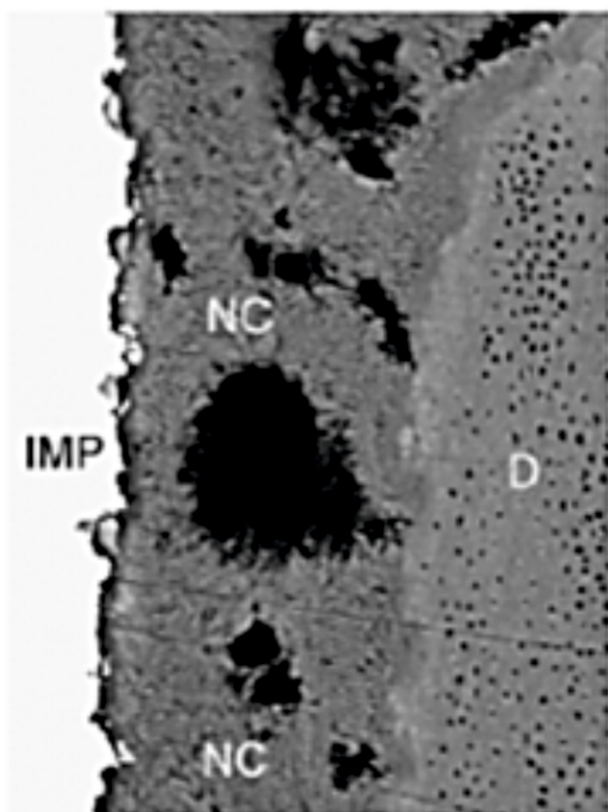


Fig-7: Formation of new cementum

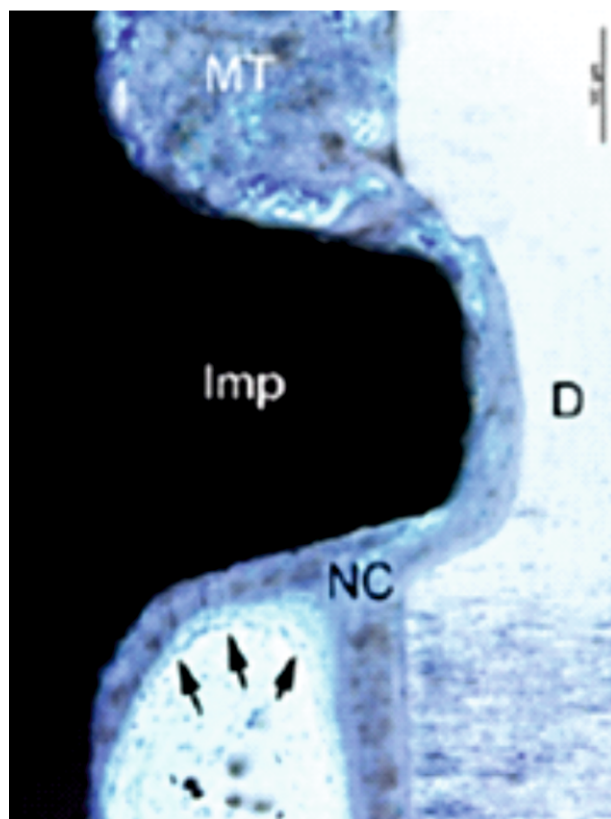


Fig-8: Amorphous mineralized tissue

and a cementoid occurred directly on and along the implant surface (Fig-7). The areas between the threads were partially filled with an amorphous mineralized tissue and connective tissue. (Fig-8)

Schwarz's histological and immunochemical observations revealed a complete exposure of dentine and pulpal cavity of the tooth fragment¹². It showed thick layers of reparative dentin formed within the coronal portion of the pulp. A hard tissue layer had homogeneously covered the exposed dentin and bridged the gap between the tooth-implant interfaces. Upon immunochemical analysis, the hard homogenous tissue is osteodentin without any evidence of dentinal tubules and were similar to adjacent alveolar bone (Fig-9). The innermost layer of the more apical part of radicular pulp showed fibroblast hyperplasia and well-vascularised tissue.

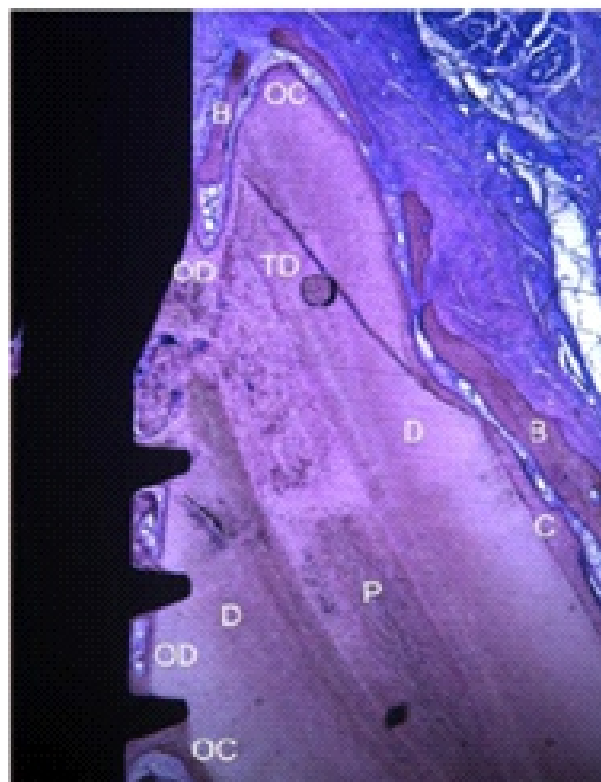


Fig-9: Formation Osteodentin on the implant surface.
 Courtesy: Frank Schwarz et al Oral Maxillofac Surg (2013).

The void created between the tooth and implant surface was homogeneously filled with compact layer of osteodentin exhibiting an intense osteocalcin antigen reactivity (Fig-10). The author named it as “DENTOINTEGRATION”.

At 8 weeks, this “dentointegration” was mainly formed by the osteodentin and it is similar to osseointegration on the pristine bone site.

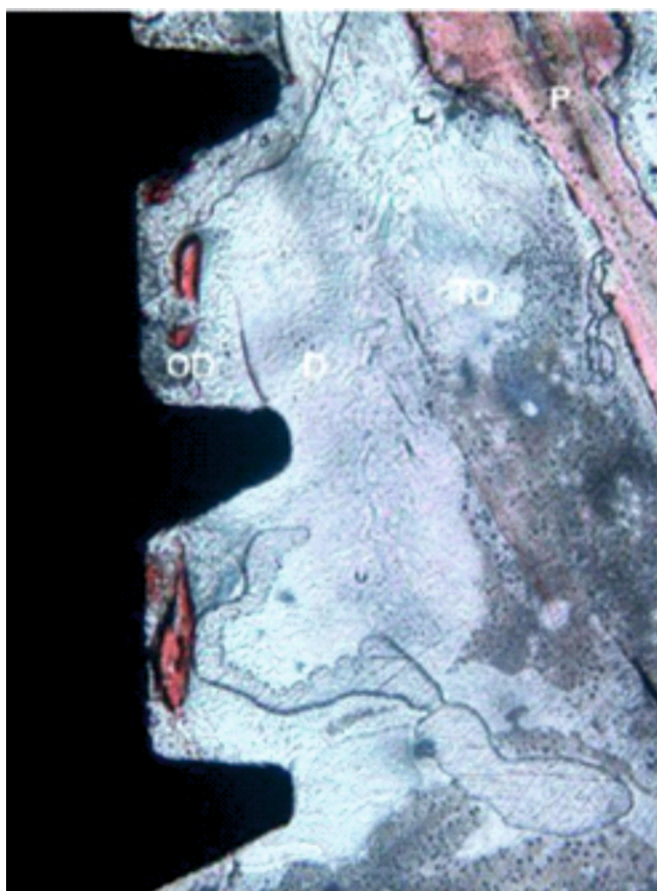


Fig-10: Dentointegration

Courtesy: Frank Schwarz et al
Oral Maxillofac Surg (2013).

Recent studies showed bone sialoprotein also play a major role in formation of hard tissue between the implant and tooth surface¹³.

ADVANTAGES⁹

No additional material cost

No co-morbidity

Single surgery

Applicable in sites with endodontic apical pathology

Prosthetic driven position of the implant

DISADVANTAGES⁹

Not yet reliable

No long-term data yet

Technique sensitive

Difficulty in preparing smaller roots and curved roots.

COMPLICATIONS:

The implants showed complications such as crestal bone loss¹⁴, failure to osseointegrate¹⁵, failure in formation of Pdl fibres³ and cementum formation³ on the implant surface.

Some studies reported rapid resorption if the tooth left with apical pathology like sinus tract or cyst¹⁶, complication of infection and bone loss¹⁷, and exposure of shield and deep probing pockets¹⁸.

CONCLUSION:

The alveolar process is a dynamic tissue that undergoes variety of changes throughout life. One of the promising solution to prevent the buccopalatal collapse after tooth extraction is socket shield procedure. It demonstrated successful results in maintaining the buccal bone thereby enhancing the pink aesthetics especially in anterior region. The void in the literature is lack of long-term reports to prove the success of this procedure. At present, this technique has high potential to improve the field of implant dentistry.

DECLARATION:

The authors declare no conflict of interest.

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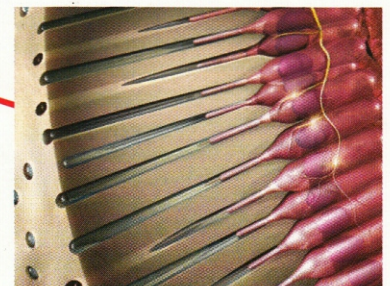
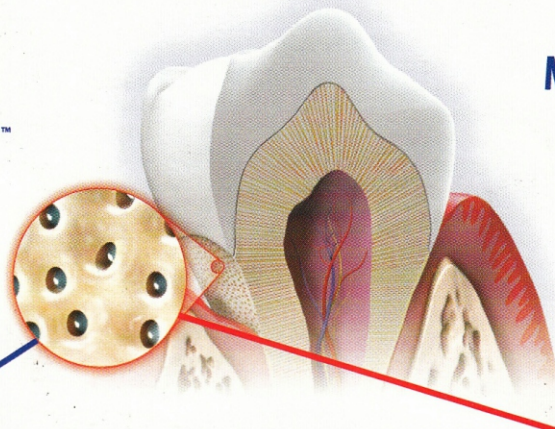
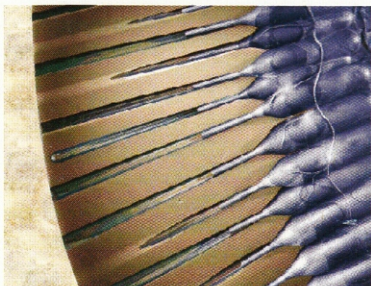
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