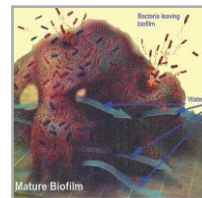
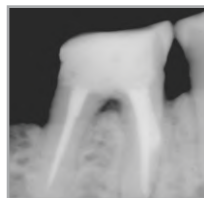


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Guest Editorial

Dear colleagues,

Season's Greetings,

Over last six decades, the science of dentistry has grown exponentially due to relentless and untiring efforts in research & today's dental scenario is undisputedly dominated by latest innovations, which have given new definition to the dentistry.

I congratulate IDA Gujarat for restarting the "Dentimedia" with regular volumes, special congratulations to Dr Amish Mehta & the editorial board.

Herewith I would also like to share few things about the marketing and advertising dentistry. Advertising and marketing of dentistry in the modern day and age has been a matter of great debate and discussion.

In India, we have been seeing a sudden spurt in advertising of dental services. Absolutely outrageous claims in terms of services and modalities, with no supporting scientific and or clinical evidence, have been repeatedly published in different forms & media all over the country, violating ethical regulations.

We, the state dental councils, who are the governing body and, guardians are intending to take a strong stand and strict action against such practices. There is also a very real need to review current advertising guidelines and standards for dental practices in the country.

As a president Gujarat state dental council and also associated with IDA, I would like to urge my fellow colleagues not to violate code of ethical regulations 1976 about the marketing and advertisements of dental practices.

Dr Viral I Patel

President Gujarat State Dental Council

Past President IDA Ahmedabad

Prof & Head, Dept of Periodontology & Implantology, CDSRC, Ahmedabad

Greetings from IDA GUJARAT STATE BRANCH

Dear colleagues,

"Change is the only constant factor in life." Dentistry is one such branch which is constantly developing and evolving in leaps & bounds. I consider myself very lucky to be a part of such a stream which is in its metamorphic and progressive times.

Although we have reached almost half way in this year, we have seen some good CDE programmes hosted by various local branches. The young and enthusiastic dentist so eager to receive knowledge at all levels are constantly updating their skills. I also appeal all the doctors of the fraternity to explore and accept new technologies of treatment to reinvent their style of working

which in turn will be beneficial to both their practice & patients.

In the end I wish you very successful & happy times ahead.

Yours in IDA, Jai Hind Jai IDA,

Dr. Nitesh Raval

President

Dr. Nitin Parikh

Hon. State Secretary

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Current Trends in Root Coverage Procedures

Dr. Sanket Shiyani^a, Dr. Bimal S. Jathal^b, Dr. Hiral Purani^c

Abstract :

Periodontal plastic surgery for the coverage of exposed root surfaces is indicated when it is related to esthetic problems, dentinal hypersensitivity, root caries, or whenever it hampers adequate plaque removal. Several techniques have been used for root coverage, such as free gingival grafts, guided tissue regeneration, subepithelial connective tissue grafts (SCTGs), laterally sliding flaps, double papilla flaps, coronally positioned flaps (CPFs), and acellular dermal matrix grafts. Among these techniques, the SCTG is considered the gold standard because of its high predictability for root coverage, including the increase of the width of keratinized tissue (WKT) and thickness of keratinized tissue (TKT). However, because an SCTG requires a second surgical site to harvest the graft, it may cause additional discomfort and hemorrhage. In contrast, the CPF is easier to perform, and effective root coverage may be obtained without the morbidity and potential clinical complications associated with the donor-site surgery but it does not increase TKT. In this report, a short, a literature review concerning current treatments for gingival recession is conducted.



Key Words : Gingival Recession, Coronally Positioned Flap, Subepithelial Connective Tissue Graft, Enamel Matrix Derivatives, Guided Tissue Regeneration.

Gingival recession is a matter of concern for both patients and dental professionals, especially when exposure of the root surface is linked to deterioration in esthetic appearance and increase in dental hypersensitivity. In most adults, the root surfaces of one or more teeth may become exposed through displacement of the gingival margin apical to the cemento-enamel junction (i.e., gingival recession). This problem has various causes: anatomic conditions, including lack of attached gingiva, muscular inserts near the gingival margin, poor tooth alignment or inadequate thickness of the alveolar bone plate and root prominences, acquired pathological conditions, such as periodontitis or viral infection, iatrogenic factors, such as improper restorations invading the biological space mechanical trauma, including trauma associated with toothbrushing or lip piercing.¹

The major aims of gingival recession treatment are full coverage of the exposed root surface; periodontal regeneration, including the formation of new cementum with attaching connective tissue fibers and new alveolar bone; gingival dimension increase; and excellent esthetic results. Many different approaches for the treatment for gingival recession have been reported in the literature without a consistent consensus⁴. This is possibly due to the poor esthetics or other clinical complications associated with each of the various clinical procedures used for managing this problem. There are currently 4 common basic categories for root coverage^{2,3}: pedicle grafts, free gingival grafts, connective tissue grafts, and guided tissue regeneration techniques with a membrane barrier. In addition, combinations of different procedures are also popular in many clinical practices and literature reports.

The best-known technique among pedicle grafts is the laterally positioned pedicle graft introduced by Grupe and Warren⁴ and later modified by Grupe⁵. The success rate of this root coverage procedure was found to be in the range of 69% ~ 72%⁶. The main advantages of the laterally positioned pedicle graft are that it is relatively easy and not time-consuming, it produces excellent esthetic results, and a second surgical site is not mandatory. The disadvantages,

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however, include that it is applicable only for single-site recession, there is a possible danger of gingival recession, dehiscence, or fenestration at the adjacent donor site, and an adequate amount of keratinized tissue at a neighboring donor site and a deep vestibule are needed. There are also other alternative procedures for a laterally positioned flap, such as a double papilla graft and an obliquely rotated graft. The double papilla graft has very limited usefulness due to its poor predictability, although the esthetic result is excellent. The obliquely rotated graft has the same disadvantages as the laterally position pedicle flap, although it can avoid other tension-releasing incisions as does the laterally positioned pedicle flap.

Free gingival grafts

A technique that has largely been superseded by the Connective tissue graft. Free gingival grafts are most commonly used in the treatment of certain mucogingival problems like lack of attached gingiva and gingival recession. The free gingival graft procedure includes a combination of 2 tissue components (keratinized epithelial and connective tissue) obtained from the palate or an edentulous ridge and its placement in the gingival recession area. Results obtained from different studies indicated that the mean root coverage treated with a free gingival graft was 88%, with the total root coverage varying from 70% to 90% of the treated sites⁷. The promising advantages of this technique are that it is a relatively easy technique, it can be applied to both single and multiple recessions, it does not depend on adjacent sites for donor tissue, and its usage is not relevant to vestibular depth. Free-gingival grafting left the patient with a large painful raw patch on their palate, which had to heal by secondary intention. These grafts also generally had poor colour match as they retained the surface characteristics of the palatal mucosa. Finally, the graft survival was often compromised by the fact that this on-lay soft tissue graft only had blood supply from its under surface.

Subepithelial connective tissue grafts (SCTG)

The CTG is the most frequently used treatment for the management of gingival recession today. Because of these disadvantages of free gingival graft, the use of free

connective tissue grafts for root coverage was introduced. The technique was presented by Langer and Calagna⁸ as a subepithelial connective tissue graft. It has a number of advantages over the Free gingival grafts including: very small donor site on the palate, which consists of a small incision, which is sutured and heals by primary intention. Higher graft survival due to dual blood supply as the graft is placed into a recipient site that is a split thickness 'pouch' providing perfusion to both sides of the graft. Excellent gingival tissue colour match is also a hallmark of the CTG making it ideal for high aesthetic cases. However the critical disadvantage is the fact that this technique is technically demanding and more time-consuming. In recent years, there have been several variations relating to the surgical technique, most notably the addition of a tunnel preparation at the graft recipient site to reduce the extent of the surgical field and improve wound healing. This method is suitable for covering recessions of both single and multiple adjacent teeth and is especially indicated when esthetics is a primary consideration. Another version of a connective tissue graft was later modified by Nelson and Harris⁹. Nelson modified the original technique by using a pedicle flap to cover the connective tissue graft and called it a subpedicle connective tissue graft, while Harris⁹ further modified this technique by using a bilateral pedicle flap to cover the connective tissue graft. He called this technique double pedicle flaps with a connective tissue graft.

The fortell of connective tissue graft procedures is generally excellent. For any given site, Nelson reported a mean root coverage of 88%, while Harris reported ~97% root coverage⁹. Long-term results (27.5 months) of subepithelial connective tissue grafts have recently been shown to be effective (98.4%) in obtaining root coverage in 100 patients with 146 Miller class I or II recession defects¹⁰. Less is known about the histologic results of applying connective tissue with a partial- thickness double pedicle graft (SCTG) in humans. Root coverage was achieved by a combination of epithelium and new connective tissue attachment after treatment with pedicle grafts. Epithelium attachment ranged from 40% to 50% and the remaining part healed using connective tissue attachment.

Guided tissue regeneration (GTR) technique

This technique is used infrequently these days but was popular during the 1990's. Tinti and collaborators¹¹ are pioneers of this treatment modality. They have introduced techniques for GTR to obtain root coverage in an attempt to re-establish a connective tissue attachment on exposed root surfaces. Pini Prato et al.¹² also exploited guided regeneration techniques to simultaneously treat osseous defects, exposed roots, and mucogingival problems. This technique used barrier membranes such as Gore-Tex (Teflon) and resorbable membranes (Type II collagen) and a coronally repositioned flap to try and regenerate labial bone, periodontal ligament attachment and gingival coverage.¹³ It is very technique sensitive and susceptible to post-operative complications, such as wound dehiscence, resulting in compromised root coverage. The added cost of the materials involved further reduced the appeal of this technique, with the results achievable not significantly better than those using more conventional techniques such as CTG or a coronally repositioned flap alone.¹⁴ The predictability and success rate of the GTR procedures used for treating gingival recession were addressed in many recent studies and varied from 45% to 81%¹² with more than 100% improvement in the width of the keratinized gingiva¹¹. The main advantages of this procedure include good esthetics, a reasonable potential for true regeneration of the lost periodontal attachment, and the absence of the need for a second donor site. The disadvantages are that it requires 2 surgical stages when nonresorbable membranes are used; it is potentially more expensive; more effort is required to care for the wound postoperatively; and the percentage of root coverage is not usually optimal due to common membrane exposure and colonization of oral microbiota on the membrane. Favorable outcomes for root coverage have recently been reported using bioabsorbable membranes.

However, the amount of root coverage obtained with a coronally positioned flap (CPF) was greater than that observed with GTR¹⁵. Unfavorable clinical results were reported in a shallow recession study using a CPF in combination with a bioresorbable membrane¹⁷. The GTR procedure was also reported to produce a mean root coverage of 75.1% in comparison with a mean root coverage of 97.1% in the connective tissue graft with a

partial-thickness double pedicle flap¹⁶. The less-favorable clinical outcome with the GTR method was further confirmed in a recent meta-analysis¹⁷.

Despite various successful results obtained from the different techniques described above, many disadvantages still seem to persist with each respective method. These various disadvantages are quite common especially in those procedures involving a 2-stage operation or 2 surgical sites, or in very complicated and technically demanding steps, and in those that may impair blood supply to the graft. These problems can be exaggerated in cases with an extensive width of root exposure.

CPF with an acellular dermal matrix

The use of Alloderm for repair of gingival recession has been well documented in the periodontal literature by a few authors and was popular during the 1990's.¹⁸ Studies suggested that the use of acellular dermal matrix was effective at gaining root surface coverage and increasing the keratinized gingiva.¹² Due to the presence of many disadvantages associated with CTG, that procedure combined with an acellular dermal matrix allograft (ADMA) and a coronally positioned pedicle flap (CPF) has been evaluated as a substitute for free CTGs in various periodontal procedures¹⁹, including root coverage. Root coverage using an ADM graft material and a coronally positioned flap has thus initially been applied to treat cases with gingival recession. Henderson et al.²⁰ reported 3 successfully treated cases using this technique, for which a mean root coverage of 97% was achieved, resulting in 100% coverage of 9 of 11 teeth. Results of another similar study also demonstrated that complete root coverage was obtained on 2 of 3 recession defects²¹. The results from these case series conform to the available evidence on the use of ADM graft material in root coverage procedures. Further comparisons between ADMAs and CTGs combined with CPF were made to see if ADMAs can replace CTGs during root coverage procedures. In 1 study, 14 teeth with denuded roots were randomly treated with either an ADMA or CTG covered by coronally advanced flaps in 7 patients. At 12 months, the root coverage gain was 4.57 mm (89.1%) versus 4.29 mm (88.7%) for the ADMAs and CTGs, respectively¹⁹.

CPF with an enamel matrix derivative

Most of the recent literature suggests that the SCTG has the highest percentage of mean root coverage with the least variability. Again, due to several unresolved disadvantages with this technique, an enamel matrix derivative (EMD) has recently been introduced in the periodontal field to overcome short-comings associated with this and currently available regenerative techniques²². Previous studies demonstrated that the enamel matrix derivative (EMD) has the ability to improve clinical parameters. EMD is an extract of enamel matrix and contains amelogenins of various molecular weights. There is evidence to show that amelogenins are involved not only in enamel formation, but also in formation of the periodontal attachment during tooth formation²³. A meta-analysis including 8 trials for periodontal tissue regeneration in intrabony defects showed that EMD (Emdogain)-treated sites displayed statistically significant probing attachment level (PAL) improvements (with a mean difference of 1.3 mm) and probing pocket depth (PPD) reductions (of 1 mm) when compared to flap surgery. Despite the overall efficacy of EMD regeneration therapy, a significant variation (similar to the results for GTRs) in clinical outcomes was observed. Meanwhile, the current literature also discloses no evidence of clinically important differences between GTR and Emdogain treatments in terms of probing attachment level gain and probing depth reduction²³.

CONCLUSION

Advantages of a laterally positioned pedicle graft are that it is a relatively easy method, produces good esthetic results, and requires only 1 surgical site. A subpedicle connective tissue graft, in addition to similar advantages listed for the earlier procedure, provides other benefits of ensuring an enriched blood supply to the connective tissue graft, being less painful, and producing fewer hemorrhagic complications at the operative site. The new method proposed in this report utilizes part of the sound principles of both a laterally positioned pedicle graft and a subepithelial connective tissue graft. The technique involves the preparation of 2 surgical sites (a palatal donor site and a recipient bed). The success rate of those procedures is still

sometimes limited due to a non-predictable or an inadequate blood supply to the connective tissue graft.

This newly developed mucogingival surgical method provides in situ de-epithelialized flaps and thus offers an optimal blood supply and clinical tissue color matching without the drawback of the need for secondary surgery. The new design also avoids many other common disadvantages, in addition to those mentioned above, such as a demanding technique and the need for meticulous care after surgery. These drawbacks are especially true when using a palatal free gingival graft, subepithelial connective tissue graft, or even guided tissue regeneration. However, there are still many limitations which need to be resolved before this new technique can be applied. For instance, the gingival tissue apical to the area of recession should be sufficiently thick. A cause-effect relationship has been reported to exist between tissue thickness and successful coverage, especially for the success of the root coverage in the guided tissue regenerative procedure. Furthermore, deep periodontal pockets and excessive bone loss should not extend beyond the mucogingival junction at the interdental area of the affected tooth. Finally, separate surgical procedures are still needed in the presence of multiple adjacent recessions.

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Retrieval of Separated Instrument from the Root Canal Using combined method of Masserann Instrument and Ultrasonics

Dr. Parth Sakaria^a, Dr. Dipti Choksi^b

Abstract :

The fracture of endodontic instruments is a procedural problem creating a major obstacle to normal routine root canal therapy. The separated instrument, particularly a broken file, leads to metallic obstruction in the root canal and impedes efficient cleaning and shaping. A broken instrument can be retrieved by various mechanical devices. Masserann kit is one such device for Orthograde removal of Intracanal metallic obstructions. Ultrasonic technique is consistently reported to be successful and safe for the removal of broken files from root canals. In this case report, I have performed a combined technique of Masserann device and Ultrasonics to retrieve the separated instrument.

Key Words : Separated Instrument, Retrieval, Masserann Kit, Ultrasonic File

Introduction

Separation of root canal instruments is one of the most troublesome incidents in endodontic therapy. Past Studies reveal that the prevalence of broken instruments ranges from 0.5%–5%¹⁻⁴

Instruments fracture before the completion of instrumentation in an infected tooth may result in a high chance of failure⁵.

The management of a case with a broken instrument may involve an Orthograde approach or a Surgical approach.

The three Orthograde approaches are as follows: (1) to attempt to remove the instrument; (2) to attempt to bypass the instrument; and (3) to prepare and Obturate to the fractured fragment⁶. The attempt to remove separated instrument should be assessed by clinician on the bases of balance between the advantages and disadvantages of retrieval of separated files because this can lead to the excessive removal of root dentin, which causes reduced root strength by 30% to 40% and predisposes the teeth to vertical root fracture.

Presented is a case of retrieval of a separated instrument using combination of Masserann instrument and

Ultrasonics.

Case report

A 38 year-old woman was referred to the Department of Conservative Dentistry, Faculty of Dental Science, DDU, Nadiad because of progressive pain related to Right Mandibular first molar (#46). Patient had moderate intermittent pain in lower right posterior region 2 years ago. She reported to dental clinic at Karamsad and got treated with endodontic treatment in 46. After about year patient started feeling mild discomfort and pain in same tooth while chewing which gradually aggravated and become worse since last 7 days. On clinical examination (Fig 1a), #46 tooth had large metallic restoration. Pain on percussion was positive. Pre-Operative Radiographic evaluation (Fig 1b) shows endodontically treated 46 and Suspected Separated instrument in mesial root. Restorative material going beyond furcal area. Furcal perforation was suspected and poor coronal restoration. Patient was recommended non-surgical endodontic Re treatment for #46 and consent was taken for same from the patient.



Fig 1(a) Pre-operative view showing large metallic restoration, (b) Pre-operative radiograph giving major finding of separated instrument and furcal perforation

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Tooth 46 was isolated with the help of saliva ejector and cotton rolls. The Coronal restoration was removed with the help of #4 round bur. Access cavity was refined to locate the canal orifices. Remaining old obturation material (Gutta Percha) was removed with the help of Gutta Percha solvent (RC solve) and H files (Mani). A straight line access to the coronal end of the separated file was first prepared by Piesso Reamers (Mani).

A circular groove (trephine), 1 mm deep, was prepared around the coronal end of the file with the help of Masseranian drill (Fig 2a). Before making any further attempts to remove the separated instrument Cleaning and shaping of Distal canals were done with the help of rotary instruments (Protaper, DENTSPLY) and irrigated with 2.5% NaOCl (Vishal, Ahmedabad, India). Distal Canals were obturated with laterally condensed gutta-percha and Zinc Oxide-Eugenol based sealer (fig 2b). It will avoid fragment of instrument lodging in distal canal during removal attempt.

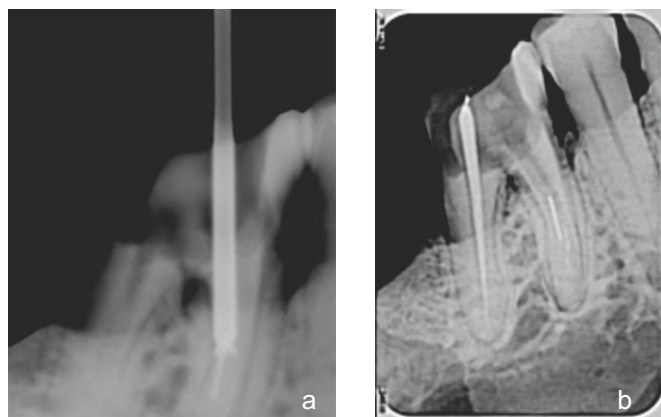


Fig 2 (a) Creating trephine with Masseranian drill and (b) Obturated distal canal.

Using Microscope under magnification of 1x with the help of ultrasonic retrieval of separated instrument was attempted after blocking mesio lingual canal with paper point. A circular anticlock wise motion was performed with ultrasonic file (U file, Woodpecker) around the separated instrument without irrigation. Which resulted in loosening of the instrument and finally removal of instrument from canal.

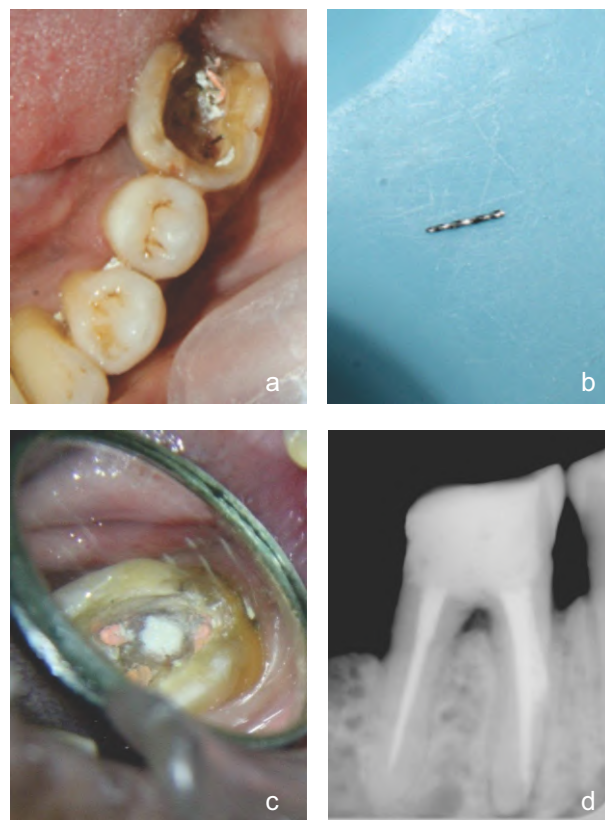


Fig 3

- (a) Dislodge fragment of instrument is visible at coronal end of canal,
- (b) fragment removed from canal,
- (c) sealing of furcal perforation with MTA and
- (d) after obturation with lateral condensation and post endodontic restoration with composite

Once the separated instrument was retrieved from MB canal both MB and ML canals were prepared with the help of Rotary instrument to the working length and obturated as previously describe. The Furcal perforation was seal with MTA followed by Post endodontic restoration with Hybrid composite restorative material. Patient was kept on monthly follow up.

Discussion

Till date, no consensus on a standardized procedure for safe, successful removal of fractured instruments exists, although various techniques and devices have been used⁷. Separation of Endodontic instrument at coronal or mid-root level creates a major obstacle in the normal routine therapy. The

perfect marriage between Ultrasonics and Microscope in the field of endodontics played an important role in increasing successful removal of fractured instruments from deep and narrow curved root canals. Working dry during the removal of separated instruments by ultrasonic tips is needed to improve visibility under the surgical microscope⁸.

The success rate declined as time consumed for removal was increased. It has been shown that success rates may drop with an increased time of treatment. This may be related to operator fatigue or over enlargement of the root canal from ultrasonic abrasion, which may, in turn, cause a higher risk for perforation. Attempts to remove fractured instruments from root canals should not take longer than 45 to 60 minutes. It was advised that after this period of time other treatment options should be considered⁹.

Creating a trephine with Masserann drill enables to decrease working time and creates a precise platform for working with ultrasonic file. Confluence of different techniques provides clinician a better platform to utilize in challenging cases.

Conclusion

In all combine method of Masserann instrument and ultrasonic U file is a safe, inexpensive, and predictable method of retrieving separated tips from root canals. It is safe in regards to amount of removed dentin. The used U files to retrieve the separated instrument is inexpensive and could be available in all the dental clinics. It is predictable in the sense that it was successfully used. This system gives dentists another armamentarium for the retrieval of separated instrument.

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Sex Differences in Gingivitis Relate to Interaction of Oral Health Behaviors in Students of Dharamsinh Desai University

Dr. Dipali Patel^a, Dr. Vasumati Patel^b

Abstract :

Background: Although many epidemiologic surveys have shown that gingivitis is more prevalent in males than in females, few studies have clearly explained what causes this difference. The objective of the present study is to explain the sex difference in gingivitis based on the interaction between oral health behaviors and related factors, such as knowledge, attitude, and lifestyle, in young people.

Methods: The study was comprised of 200 subjects (100 males and 100 females), aged 18 and 25 years. Gingivitis was assessed by the percentage of bleeding on probing (%BOP). Additional information was collected regarding oral hygiene status, oral health behaviors, and related factors. Multiple-group modeling was also conducted to test for sex differences.

Results: Females had greater knowledge, a more positive attitude, a healthier lifestyle, and higher level of oral health behaviors than males. There were significant differences in the paths (i.e., from lifestyle, knowledge, and attitude to %BOP) through oral health behaviors and oral health status.

Conclusions: Sex-based differences in gingivitis in young people can be explained by oral health behaviors and hygiene status, which are influenced by lifestyle, knowledge, and attitude. To prevent gingivitis, different approaches to males and females may be useful.

Key Words : Gingivitis, Lifestyle, Dental Plaque, Dental Attitude



Introduction

Epidemiologic surveys have shown that gingivitis is more prevalent in males than in females.¹⁻⁵ Albandar⁶ and Grossi et al.⁷ suggest that it is the physiologic and behavioral differences between the two sexes that contribute to the risk for gingivitis. For example, there are differences related to oral health behaviors; i.e., females brush their teeth, use extra cleaning devices, and visit the dentist for regular check-ups more frequently than do males.^{8,9}

It is known that oral health behaviors are associated with various factors, including knowledge,¹⁰⁻¹² attitude,¹¹⁻¹³ lifestyle,^{14,15} stress,^{16,17} education level,¹⁸ and socioeconomic status.¹⁹ Of these six factors, knowledge, attitude, and lifestyle have been related to sex differences.^{11,12,15} However, there is no clear explanation about what causes these variations.

Although gingivitis does not always progress to

periodontitis, periodontitis is preceded by gingivitis. The prevention and early treatment of gingivitis in young people may be relatively simple and effective.²² Understanding how sex differences in oral health behaviors affect gingival condition in young people may enable efficient prevention of periodontitis through improved therapeutic approaches against gingivitis.

The aim of the present study is to explain sex-based differences in gingivitis, based on the interaction among gingivitis, oral health behaviors, and other factors in young people.

First, we postulated that :

1. Gingivitis was caused by the accumulation of dental plaque and calculus
2. The accumulation of dental plaque and calculus was directly affected by poor oral hygiene (i.e., infrequent toothbrushing, no use of dental floss, and infrequent dental attendance pattern)
3. Poor oral hygiene was directly affected by unhealthy lifestyle behaviors, the lack of knowledge about oral health, and negative dental attitude.

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Secondly, we hypothesized that this process from lifestyle, knowledge, and attitude to gingivitis was different between males and females, and the different process contributes to the higher prevalence of gingivitis in males.

Material & method :

Study Population

Of 200 students were selected, who underwent a general health examination from June 2011- May 2012 at the Dharamsinh Desai University with an age of 18 – 24yrs volunteered to receive an oral examination. The study was approved by the ethical committee of Dharamsinh Desai University. Verbal consent was obtained. All subjects completed written questionnaires regarding personal health. Thirty five students who smoked or were >24 years old were excluded to avoid the effects of smoking or age. The data of 200 students (100 male and 100 female) were analyzed.

Questionnaire

A questionnaire was used to assess a number of oral health-related variables. The following variables were examined: 1) lifestyle; 2) dental knowledge; 3) dental attitude; and 4) oral health behaviors.

Lifestyle

The subjects reported seven general health habits in daily life (yes or no) suggested by Belloc and Breslow.²³ The score of lifestyle was determined by the sum of positive responses provided to the following items:

- 1) no experience of smoking ; 2) no experience of drinking alcohol ; 3) regular physical exercise ; 4) maintaining proper weight ; 5) sleeping regularly ; 6) eating breakfast every day ; 7) not eating between meals.²³

Dental knowledge

The subjects were asked if they could explain the following dental terms:¹² Calculus, dental plaque, dental floss, sealant, periodontal disease, temporomandibular disorder, fluoride-containing mouthwash, topical application of fluoride.

Dental attitude

The subjects were asked how they cope with pain in teeth or

gingiva (“Coping with pain”), and whether they consult dentists when dental treatments are recommended after a dental check-up in school (“Behavior after a dental check-up”).¹²

Oral health behaviors.

The subjects reported toothbrushing frequency, use of dental floss, and frequency of dental visits in the past year.²

Oral Examination

One dentist examined the oral health status of the participants. The number of teeth present was determined. The percentage of sites in bleeding on probing (%BOP) was also examined in all the teeth. BOP is an earlier and more sensitive indicator of inflammation than probing depth.²⁶ Therefore, in this study, we defined %BOP as an earlier sign of periodontal disease or gingivitis. The level of dental plaque and calculus was assessed using the oral hygiene index.²⁷

Statistical Analyses

A statistical program was used for data analyses and the percentage of each variable was noted. To avoid the gender bias same number of males & female were taken into consideration in the study. Results of the study :

VARIABLES	Males (n=100)	Females (n=100)
% BOP	75%	64%
Debris index	0.78%	0.63%
Calculus index	0.35%	0.29%
Regular checkup		
- Regular dental checkup	15%	30%
- Dental visit due to trouble	45%	55%
- No visit	20%	15%
- No answer	20%	-
Tooth brushing		
- 3 Times	2%	10%
- 2 times	38%	63%
- < or 1 time	60%	27%
Dental floss(usage)		
- Use everyday		15%
- No use	90%	71%
Knowledge		
- >2 words	10%	22%
- 1 word	45%	40%
- No words	45%	34%
Coping with pain		
- Dental visit readily	67%	80%
- No dental visit	20%	12%
- No answer	13%	8%
Behaviour after check up		
- Willing for treatment	66%	73%
- Unsure of treatment	31%	15%
- Will not go for treatment	5%	3%
- No answer		

Charts

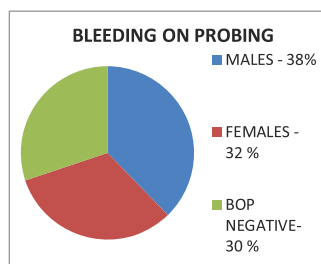


FIG NO. 1

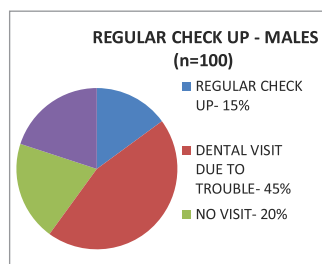


FIG NO. 2(i)

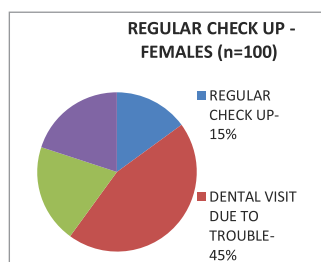


FIG NO.2(ii)

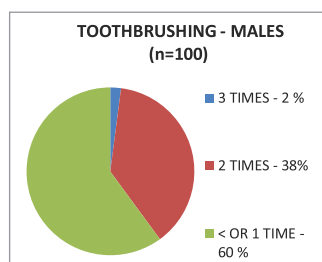


FIG NO.3(i)

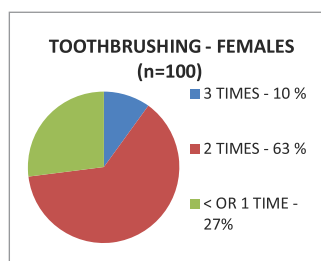


FIG NO. 3(ii)

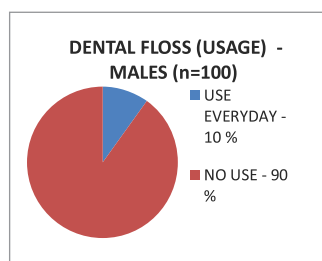


FIG NO. 4

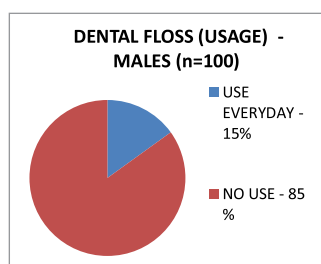


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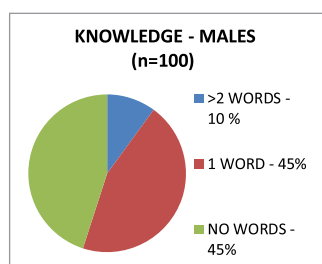


FIG NO. 5(i)

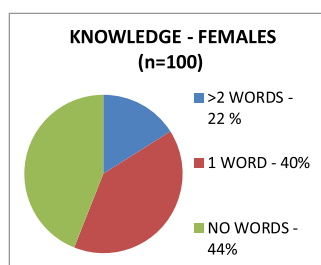


FIG NO. 5(ii)

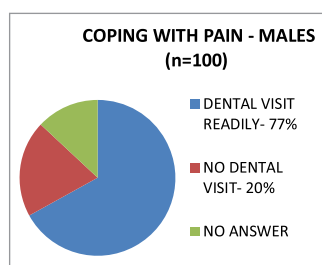


FIG NO.6 (i)

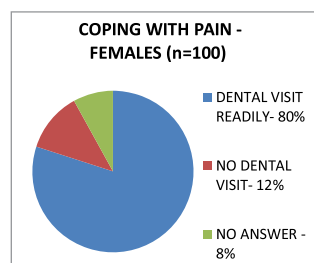


FIG NO.6 (ii)

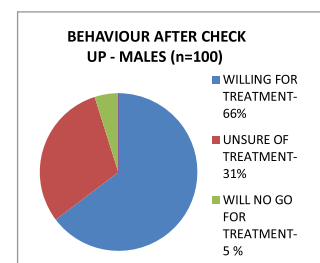


FIG NO.7(i)

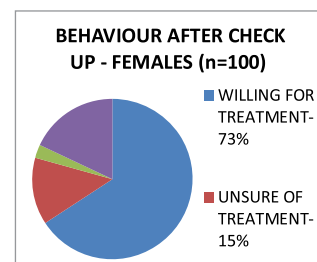


FIG No.7 (ii)

Discussion

Our results showed that the females had greater knowledge about oral health, a more positive attitude toward dental visits, a healthier lifestyle, and higher level of oral health behaviors than males. Moreover, analysis of multiple-group modeling in this study suggests that the sex difference depends on significant differences in paths; lifestyle, knowledge, and attitude to oral health behaviors; oral health behaviors to oral hygiene status; and oral hygiene status to %BOP in young people. Results of this study indicate that knowledge, attitude, and lifestyle indirectly cause the differences between sexes in the prevalence of gingivitis in young people.

We used structural equation modeling to explore the complex causal relationship involved in periodontal disease. It is noteworthy that many studies analyzed the relationship between periodontal disease and oral health behaviors, putting specific variables into mathematically determined models.²⁴⁻²⁶ In a multivariate analysis, many researchers prefer to use the logistic regression or multiple linear regression analysis. These analyses are set on only one dependent variable. In other words, these analyses enable one to examine direct effects from independent variables to dependent variable, not indirect effects. In addition, they cannot reveal complex and diverse relationships between independent variables and dependent

variables. On the other hand, structural equation modeling enables variables to act both as independent and dependent, and explore the complex causal relationship involved in disease processes. Moreover, using multiple-group analysis, we could evaluate sex differences in model parameters. Multiple-group modeling tests for the significance of any differences found between males and females. Compared to the separate analyses for each group, simultaneous analysis of both groups provides more accurate parameter estimates.²⁸

This study explains differences in sex-based variations in the prevalence of gingivitis based on four findings:

- 1) females have greater knowledge about oral health, a more positive attitude toward dental visits, and a healthier lifestyle than males
- 2) knowledge, attitude, and lifestyle have an effect on oral health behaviour
- 3) females have a higher level of oral health behavior than males
- 4) females have lower levels of dental plaque, calculus, and gingival inflammation than males because oral hygiene status is influenced by oral health behavior. It is possible that knowledge, attitude, and lifestyle indirectly cause sex differences in gingivitis.

Our results agree with previous studies^{11,12} that females had greater knowledge and a more positive attitude toward dental visits (Fig no.5 (i,ii)). The reason for sex-based differences in knowledge and attitude is still unclear. However, there are two possibilities. First, the difference in social roles between males and females may be related to differences in knowledge and attitude. Women are generally responsible for family members' health (i.e., watching for signs of illness, helping when ill, and making appointments or escorting them to clinics). Second, females tend to have more interest in health than males. Interest is strongly related to knowledge.²⁹ Therefore, females may be more informed about health and more willing to seek dental help (Fig no.7(i,ii)).

We showed that frequency of toothbrushing affected the dental plaque level and knowledge and attitude affected the frequency of toothbrushing in males, but did not observe these relationships in females. Most females and males in

our study brushed their teeth twice per day. Presumably, because of the high proportion of the subjects who brushed twice daily, these relationships might not be obvious in females.

We propose different approaches to males and females to prevent gingivitis. This study showed that regular dental visit had a direct effect on lower level of dental plaque and calculus. In males, knowledge had a small effect on regular dental visits, but attitude had a large effect on regular dental visits and there was correlation between knowledge and attitude (Fig no.6(i,ii)). Therefore, if males exhibit an improved attitude after being provided with knowledge, they will visit the dentist regularly. Furthermore, psychologic intervention may be effective in changing the attitude. The psychologic intervention has motivational counseling; for example, cognitive-behavioral techniques of self-monitoring, contingency management, stimulus control, goal setting, and reinforcement. On the other hand, in females, dental knowledge had a moderate effect on regular dental visits. Attitude had a large effect on regular dental visits and there was a small correlation between knowledge and attitude. If females are provided with dental knowledge, they are likely to visit the dentist regularly (Fig no.2(i,ii)). In addition, this study showed that the frequency of toothbrushing affected dental plaque levels in males, but not in females. Instructions for more frequent daily toothbrushing in males might improve oral hygiene. In brief, the approach to males may be not only to provide dental knowledge but also to change the attitude and provide instructions for more frequent daily toothbrushing. The approach to females may be simply to provide dental knowledge.

In this study, levels of dental plaque and calculus had a stronger effect on %BOP or on gingival inflammation in females than in males (Fig no.1). Periodontal condition is influenced by sex hormones. Increased levels of estrogen and progesterone during pregnancy and puberty or in patients taking oral contraceptives, have been reported to result in increased gingival vascularity and inflammation.²² Female sex hormones do not induce periodontal disease by themselves. However, they may alter periodontal tissue condition in response to microbial plaque, and thus indirectly contribute to periodontal disease. Additionally,

there are sex differences in immune response that might affect a sex difference in periodontal disease susceptibility. Although females may be more susceptible to gingivitis than males because of sex hormones and immune response, females have a lower prevalence of gingivitis than males.¹⁻⁵ In this study, females had significantly lower %BOP and higher scores of behavioral factors. Presumably, behavioral factors might contribute to the sex differences in the prevalence of gingivitis more than biologic factors. Future studies may be needed to assess both biologic factors and oral health behaviors to account for sex differences in gingivitis.

Our study had some limitations. We did not consider sociologic factors in this study. There are studies reporting a relationship between sociologic factors and periodontal disease.¹⁹ Bird and Rieker²⁸ reported that females have lower incomes than men because females work in lower status jobs. However, because the subjects in our study were students, sociologic factors may not be related to sex differences. Second, we did not investigate psychosocial factors. Several studies report that psychosocial stress is related to periodontal disease,^{16,17,19} and therefore, further investigations are needed. Finally, further research is required to include upstream factors (social determinants) of oral health behaviors such as community income distribution and social networks in our model. Social networks via social influence or supportive functions influence health-promoting or health-damaging behaviors. Presumably, oral health behaviors must be influenced by social networks. Investigating upstream factors of oral health behaviors could be useful for understanding the underlying causes of periodontal disease.

Conclusion

The present study demonstrates that sex-based differences in gingivitis in young people can be explained by the interaction of oral health behaviors and the pathway of these related factors, oral health behaviors and hygiene status, which are influenced by lifestyle, knowledge and attitude.

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A Technique For Denture Identification

Dr. Kavan Patel^a

Abstract :

Body identification is an essential requirement for forensic and medicolegal investigations or, in case of an accident, loss of memory, states of unconsciousness being inadvertently misplaced on admission to a hospital or in identifying bodies of those who have died in a disaster.

Dental prostheses labeled with the patient's name and further unique identifiers such as gender, phone number, address, job place, date of birth may play an important role in forensic casework's. Identification has long been accredited by the dental profession and various denture identification systems have been reported in the literature.

This article describes a technique for placing a computer generated identification tags within the acrylic removable dentures in a simple and cheap way that satisfy all the forensic requirement for a suitable denture marker. So, helping in denture identification in forensic dentistry.

Key Words : Denture Labeling, Identification, Forensic Dentistry.

Introduction

In mass disasters, identification of unknown cadavers is important not only from a humanitarian point of view but also for legal reasons and in connection with insurance. Various identification techniques are available today, such as finger printing, DNA profiling and the comparison of dental structures. Not all methods of identification are equally useful in practice and the ultimate identification is often made possible only by a combination of several techniques.¹

Denture identification systems are important for hospitalized patients, patients in long-term care facilities, for forensic identification purposes and other social reasons.²⁻⁵ After major disasters such as earthquakes, fires or floods, accurate & early identification of the dead & injured becomes of utmost importance. At times the only

identifiable remains are a victim's partial or complete dentures.⁶ Patients in nursing homes and other health care facilities often misplace their dentures, leading to the problem of identification.⁷

Therefore, dental prostheses labeled with at least the patient's name and further unique identifiers such as gender, phone number, address, job and national identity number may play an important role in forensic casework's.⁸

Case report

A 65-year-old male patient reported to the department with chief complaint of difficulty in chewing food. Intraoral examination revealed a completely edentulous maxillary and mandibular arch. Patient was a mill worker. Treatment plan was to fabricate a complete denture with the identity of the patient for future identification.

Technique

1- Type the patient's data such as name, gender, national identity number, phone number, country, and job in a computer and to be printed on sheet in a character of 8 point font size.



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2- Cut the paper into small pieces according to denture size, each one represents a patient label.(figure 1)



Figure 1 – Patient label on paper

3- After waxing the denture up, and during flasking and packing, put a small amount of the heat cure acrylic resin in the posterior-lateral area of the palate, then place a wet cellophane paper and perform the trial closure.(figure 2)



Figure 2- After complete dewaxing

4- Re-open the flask, remove any flashes with a sharp knife, put the identification label, it is best placed in the maxillary posterior-lateral area of the palate, the posterior buccal flange and in the mandibular lingual flange.(figure 3)

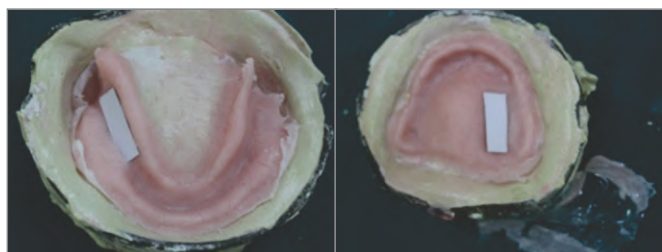


Figure 3- label is placed during trial closure

5- Pack the rest of the acrylic resin, then close the flask, cure the denture, deflask, trim and polish the denture to complete the procedures.(figure 4)



Figure 4- label seen after processing and finishing & polishing

6- Alternatively, the label can be incorporated after the denture is processed by cutting a depression of approximately 1mm deep, slightly wider than the size of the label. The label can then be covered with self cure acrylic resin of the same color of the heat cure acrylic resin.

DISCUSSION

Identification is an essential requirement of any medicolegal investigation because a mistaken identity may pose a problem in delivering justice. Various parameters like facial features, scars, tattoos, deformities, peculiarities and personal belongings can assist in the identity of a person. When all these parameters fail to identify a body as in case of 100% burns or putrefaction or bodies recovered from water or in case of severely traumatized patients in particular the mass casualties normally associated with aviation disasters, dental identification continues to be crucial, as the teeth and the jaw, which appear to withstand a great deal of trauma than the rest of the body, can solve this difficulty.⁹

The frequency of edentulousness has not changed in the present. Edentulous persons represent nearly 2 % of population. The oral status of population varies in different countries, and the wearing of complete denture will be a fact for the future. Hence there is a need to address the issue of denture marking for social and legal problems.¹⁰

The paper label used in this study for denture marking appears to satisfy all requirements recommended for denture markers. It is biologically inert (when incorporated into the denture), durable, not expensive, easy to inscribe, possible to retrieve after an accident, and survive elevated temperature for a reasonable time under normal circumstances, and doesn't affect the strength of the

denture due to its malleability.¹¹

Over the years, several methods of denture labeling have been reported in the literature, these techniques include surface marking, inclusion techniques using metal or nonmetal materials, micro labels and microchips. These techniques are either time consuming, esthetically unpleasant, using equipments not readily available in most of dental laboratories and if the denture needs relining, the denture label becomes invisible.^{12,13}

Although, microchips inclusion techniques such as radio-frequency identification (RFID)-tags, fluorescence markers and other advanced inclusion techniques within dental prostheses have been suggested as means of effectively labeling dentures and permitting rapid and reliable identification of the wearer. However, these techniques are very expensive, as they exceed far the cost of the acrylic denture. In addition they need sophisticated equipments for fabricating microchips and its reading that don't suit a developing country. Moreover, microchips are considered weak point in the denture structure as it should be put after denture processing and should be put in an area subjected to be relined.¹⁴

Papers used in this study are easily available, not expensive and their incorporation into the denture as well as its reading don't need sophisticated techniques.

The prepared label can be inserted into denture by prefabrication & postfabrication technique. In prefabrication technique the label is inserted on the intaglio surface after trial closure of denture flasks. The intaglio surface is the area where least adjustment is done during denture insertion. The background of the label is clear & only the black markings of the label can be clearly seen even after relining of dentures, if required, at further appointments.⁵

In postfabrication technique the label is inserted in a preparation site, which is located in the flattest portion on the cameo surfaces of the lingual flange of the mandibular denture and/or palate of the maxillary denture. These sites do not interfere with esthetics of the denture. Generally these sites are acceptable for the patient. These areas are also not removed during postinsertion adjustments or routine relining procedures.⁶

Since there is no international consensus regarding the issue of denture marking it is important to address it and suggest newer methods for its identification⁹. A survey from the Nordic countries has shown that if denture marking was in general use, the establishment of identity by forensic odontology in cases of fire would increase by about 10%. Increased international collaboration is needed to solve the issue of denture marking for clinical and forensic purposes.¹⁰

SUMMARY

The technique proposed in this article describes easy to use and very cost effective way of denture labeling. The added information about the patient name, age, sex, resident name able to satisfy all the forensic requirement for a suitable denture marker. The equipments required are easily available in any institution, dental laboratory or dental clinic. By this method denture labeling could be done in existing prosthetic devices which were not labeled previously or it could be incorporated in newly constructed prosthesis. The procedure could be easily performed.. Routine marking of all dentures by this method is advocated.

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Interspecies Communication in Plaque Biofilms

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Abstract :

Dental plaque is a host-associated biofilm. The significance of the biofilm environment has been increasingly recognized in recent years because the environment itself may alter properties of the microorganisms. The biofilm community is initially formed through bacterial interactions with the tooth and then through physical and physiologic interactions among different species within the microbial mass. Furthermore, the bacteria found in the plaque biofilm are strongly influenced by external environmental factors that may be host mediated. Periodontal health can be considered to be a state of balance when the bacterial population coexists with the host and no irreparable damage occurs to either the bacteria or the host tissues. Disruption of this balance causes alterations in both the host and biofilm bacteria and results ultimately in the destruction of the connective tissues of the periodontium. Periodontal microbiota is a complex community of microorganisms, many of which are still difficult or impossible to isolate in the laboratory. Currently, it is apparent that multiple species function as pathogens, and species that function as pathogens in one site also may be present in low numbers in healthy sites. Their survival, replication & proliferation of these periodontal pathogens is largely based on their ability of communicate and co-exist in the complex biofilm.

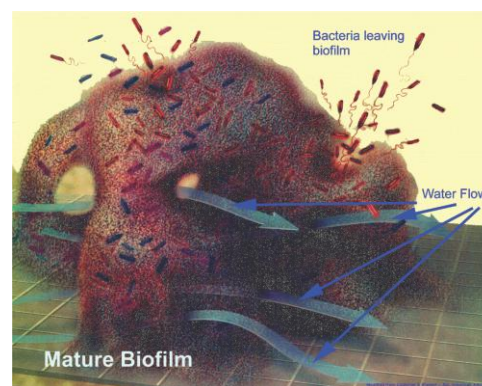
Key Words : Communication in Biofilm, Quorum Sensing, Plaque Biofilm, Co-aggregation

Introduction to Plaque as a Biofilm

Dental Biofilm defined as diverse community of micro-organisms found on tooth surfaces as a biofilm, embedded in a extracellular matrix of polymers of host & microbial origin. (Clerehugh).⁵

Biofilms are fascinating structures. A crude analogy to the development of a biofilm might be the development of a city. Communication between individuals in a city is essential to allow inhabitants to interact optimally. Communication between bacterial cells within a biofilm is also necessary for optimum community development and is performed by production of signaling molecules such as those found in “quorum sensing” or perhaps by the exchange of genetic information.^{25,26} The long-term survival of the human species as well as a species in a biofilm becomes more likely if that species (or the human) colonizes multiple sites. Successful human colonization of new environments requires several important factors including a stable nutrient supply, an

environment conducive to proliferation, and an environment with limited potential hazards.¹⁷ In a biofilm, such as dental plaque, microorganisms are in close proximity to one another and interact as a consequence. These interactions can be beneficial to one or more of the interacting populations, while others can be antagonistic. A major advantage is the protection that the biofilm provides to colonizing species from competing microorganisms, from environmental factors such as host defense mechanisms, and from potentially toxic substances in the environment, such as lethal chemicals or antibiotics.¹⁶



Microbial metabolism within plaque will produce gradients in factors affecting the growth of other species, including the depletion of essential nutrients with the

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simultaneous accumulation of toxic or inhibitory byproducts. These gradients lead to the development of vertical and horizontal stratifications within the plaque biofilm.⁸ Such environmental heterogeneity enables organisms with widely differing requirements to grow, and ensures the co-existence of species that would be incompatible with one another in a homogeneous habitat.⁶

Beneficial interactions include the concerted action of two or more species to metabolize host macromolecules, such as mucin (individual species are unable to catabolize such molecules)⁷, the development of food chains²⁵ (e.g. lactate consumption by *Veillonella* spp),²⁰ and coaggregation. Antagonistic interactions include the production of inhibitory substances such as bacteriocins, H_2O_2 , and organic acids.⁸

Early colonizers of the tooth surface are mainly *Neisseria* spp. and streptococci. The growth and metabolism of these pioneer species changes local environmental conditions (e.g. Eh, pH, coaggregation, substrate availability) thereby enabling more fastidious organisms to colonize, e.g. obligate anaerobes tend to be late colonizers in plaque, only able to grow once favorable gradients in O_2 or Eh have developed in the biofilm.⁶

Stages of formation & development of oral biofilms through interspecies interaction:^{12,17,22}

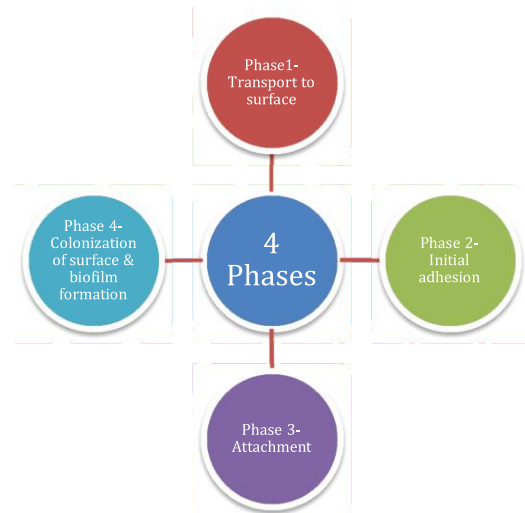
1. FORMATION OF PELLICLE

All surfaces of oral cavity coated with pellicle; within nanoseconds after vigorously polishing the teeth, a thin saliva derived layer called 'acquired pellicle' covers the tooth surface.⁴

Pellicle consists of glycoproteins (mucins), proline-rich-proteins, phosphoproteins (eg: statherin), histidine-rich-proteins, enzymes (eg: amylase) & other molecules that function as adhesion sites for bacteria.¹² The film, which may be free of microorganisms, covers the entire tooth surface completely & fills pits, fissures & enamel surface defects. A fully established pellicle can be seen within 30mins, & within 24hrs, it stains positively for erythrosine dye. Thickness of pellicle ranges from 0.1 to 0.8 microns.⁴

Pellicle forms by selective adsorption of environmental molecules. Mechanism involved in pellicle formation include electrostatic, van der waal's & hydrophobic forces.⁶

2. INITIAL ADHESION & ATTACHMENT OF BACTERIA



Phase 1: Transport to Surface

Involves initial transport of bacteria to the tooth surface. Random contact occurs through Brownian motion (average displacement of 40 / hour), through sedimentation of microorganisms, through liquid flow, through active bacterial movement i.e. chemotactic activity.⁸

Phase 2: Initial adhesion

Results in initial 'reversible' adhesion of bacteria; initiated between bacterium & surface from a certain distance (50nm) through long range forces, & short range forces including van der waal's attractive forces & electrostatic repulsive forces.⁴

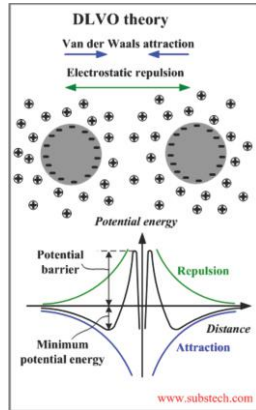
DLVO theory:

Derjaguin, Landau, Verway & Overbeek (DLVO) postulated that, above a separation of 1nm, the summation of previous 2 forces describes the long range interaction; & the total interaction energy called 'Total Gibbs Energy' (G_{TOT}).^{4,12}

Total Gibbs energy: determines the strength of adhesion

$$G_{TOT} = G_A + G_E$$

G_A = van der Waals attractive force, G_E = electrostatic repulsive force.



G_{TOT} consists of

- **Secondary minimum:** where a reversible binding takes place, 5-20 nm from the surface
- **Positive maximum:** an energy barrier B to adhesion
- A steep **Primary minimum:** <2 nm away from the surface, irreversible adhesion is established

Phase 3: Attachment

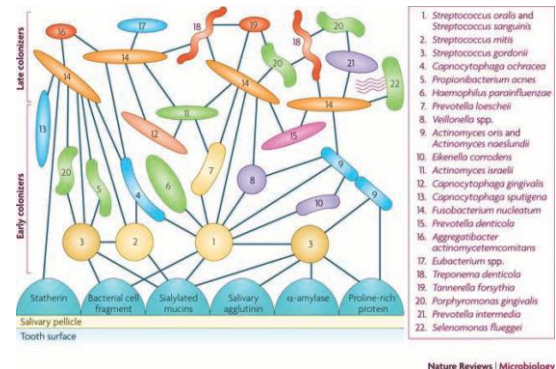
After initial adhesion, firm attachment established by specific interaction: covalent, ionic or hydrogen bonding. On a rough surface, bacteria better protected against shear forces, hence change from reversible to irreversible bonding occurs more easily & frequently. Bonding between pellicle & bacteria is mediated by specific extracellular proteinaceous components (adhesions) of organisms & receptors (i.e. proteins, polysaccharides or glycoproteins) on surface (pellicle). Example: *S. sanguis* bind to acidic proline-rich-proteins & other receptors in pellicle such as α amylase & sialic acid.¹²

Some molecules from pellicle (example: proline-rich-proteins) undergo conformational changes when they adsorb to tooth surface so that new receptors are available; these hidden receptors called 'Cryptitopes'.⁴ Example: *A. viscosus* recognizes cryptic segment of proline-rich-proteins, which are available on adsorbed molecules.⁴

Phase 4- Colonization Of Surface & Biofilm Formation

When firmly attached microorganisms start growing & newly formed bacterial clusters remain attached, then microcolonies or biofilm can develop; here on interbacterial

connections occur.^{2,4} Atleast 18 genera from oral cavity have



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Prosthodontic Management Of Maxillary Flabby Ridge

Dr. Japan Bhatt^a

Abstract :

The presence of displaceable denture-bearing tissues often presents a difficulty when fabricating complete dentures. Unless managed appropriately, such hyperplastic tissues adversely affect the support, retention and stability of complete denture. A variety of techniques have been suggested to circumvent the difficulty of making a denture to rest on a flabby ridge, but most are technique sensitive and rely on materials not commonly used in contemporary dental practice. This paper presents a case report on impression making technique for edentulous patients with flabby alveolar ridge making use of contemporary impression materials.



Key Words : Flabby ridge, hyperplastic tissue, modified mucostatic technique

Introduction

The quality and performance of complete denture prosthesis is often a reflection of its support, retention and stability. A master impression for a complete denture should record the entire functional denture-bearing area to ensure maximum support, retention and stability for the denture during use. However difficulties arise when the quality of the denture bearing area is not suitable for this purpose. Displaceable, or 'flabby ridges', present a particular difficulty and may give rise to complaints of pain or looseness relating to a complete denture that rests on them.

A 'fibrous' or 'flabby' ridge is an area of mobile soft tissue affecting the maxillary or mandibular alveolar ridges. It develops when hyperplastic soft tissue replaces the alveolar bone. Published studies indicate that the prevalence of flabby ridges can vary, occurring in up to 24% of edentate maxillae and in 5% of edentate mandibles.^{1,2} Historically, flabby ridges found in the anterior maxilla were a feature of the 'combination syndrome'.³ In this condition, the flabby ridge was thought to occur as a result of a maxillary complete denture opposing mandibular anterior natural teeth, without proper posterior occlusal support. Such flabby tissues could also arise as a result of unplanned or uncontrolled dental extractions. Typically these flabby

ridges are composed of mucosal hyperplasia and loosely arranged fibrous connective tissue as well as more dense collagenised connective tissue. In the soft tissue, varying amounts of metaplastic cartilage and/or bone have been reported.

A particular problem is encountered while making an impression of a flabby ridge, where if the flabby tissue gets compressed during impression making the tissues later tend to recoil and dislodge the resulting overlying denture.

Hence an impression technique is required which will compress the non-flabby tissues to obtain optimal support and at the same time, will not displace the flabby tissues.

A multitude of impression techniques have been described for overcoming the problem of the flabby ridge. Liddlelow⁴ described a technique whereby two separate impression materials are used in a custom tray (using 'plaster of Paris' over the flabby tissues, and zinc oxide and eugenol over the normal tissues). Osborne⁵ described a technique whereby two separate impression trays and materials are used to separately record the flabby and normal tissues, and then related intra-orally. Watson⁶ described the 'window' impression technique where a custom tray is made with a window or opening over the (usually anterior) flabby tissues. A mucocompressive impression is first made of the normal tissues using the custom tray and zinc oxide and eugenol. Once set, it is removed, trimmed, and re-seated in the mouth. A low viscosity mix of 'plaster of Paris' is then painted onto the flabby tissues through the window. Once set, the entire impression is removed. Each of these

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techniques might be considered cumbersome, and the difficulties associated with their manipulation could lead to inaccuracies. Watt and McGregor⁷ — recently revisited by Lynch and Allen — described a technique where impression compound is applied to a modified custom tray. The thermoplastic properties of this material are then manipulated to simultaneously compress the normal tissues, while avoiding displacement of the flabby tissues using the same material and impression tray. Over this manipulated impression compound, a wash impression with zinc-oxide and eugenol is made. While this final impression technique is clearly less complex than the previous three described, the problem with all four techniques is that they rely on materials such as 'plaster of Paris', impression compound, and zinc-oxide and eugenol. Many dental practitioners now rely on newer, more easy-to-use materials, such as polyvinylsiloxanes.⁸

The purpose of this paper is to describe an impression technique for making impressions of denture bearing areas containing flabby ridges, which uses a simplified technique and more widely used impression materials.

CLINICAL REPORT

A 73-year-old male was referred to the Department of Prosthodontics and Crown & Bridgework, Faculty of Dental Science, Dharmsinh Desai University, Nadiad, for Prosthodontic rehabilitation.

Patient complained of missing teeth and subsequent inability to chew food. Medical history revealed no systemic illness. On extra-oral examination, no abnormality was detected in the temporomandibular joint. The patient's attitude was philosophical with excellent neuromuscular co-ordination. The face form of patient was ovoid with long adequately supported lips but the speech was affected due to absence of teeth.

Dental history revealed that the patient had undergone extractions in the maxillary and mandibular arches due to periodontal reasons and was edentulous in the maxillary and posterior mandibular arch since last 10 years and edentulous in anterior mandibular region since 7 years.

On intra-oral examination, the patient was completely

edentulous with an extensive area of flabby tissue on the maxillary anterior region with a resorbed residual ridge in mandibular arch. (fig 1).

The completely edentulous maxillary and mandibular arches with presence of hyperplastic tissue on the anterior maxillary residual ridge would prove as a challenge in fabrication of prosthesis with adequate support, retention and stability.

Three treatment options were available for the patient:

- (i) Surgical removal of flabby tissue prior to conventional Prosthodontic procedures in denture fabrication
- (ii) Implant supported prosthesis
- (iii) Fabrication of complete denture without surgical intervention

All treatment modalities were discussed with the patient but patient refused options of surgical modality and implant prosthesis.

Hence, a conventional maxillary and mandibular complete denture prosthesis was planned for the patient with modified impression making technique.

Fig 1:



PROCEDURE & RESULT

The primary impression of maxillary denture bearing area was made with irreversible hydrocolloid to minimize distortion and record the flabby tissue in undisplaced manner. Relief wax was given in incisive papilla and the mid-palatine raphe area and the displaceable flabby tissue area was covered by 3 mm spacer wax over which a special tray was fabricated with auto-polymerizing acrylic resin. Border molding was done with green stick compound. Final impression was made in 2 stages- First, only the relief wax over the mid-palatine raphe was removed with wax over the flabby tissue area intact and zinc

oxide eugenol impression was loaded (except in the area of flabby tissue) and first stage impression was made (fig 2). Now the wax over flabby tissue area in custom tray is removed and escape vents are created (fig 3). Tray adhesive is applied and light body polyvinylsiloxane impression material is loaded in the region and the second stage impression is made (fig 4). Once set, the impression was removed from the mouth and inspected. The impression was re-inserted to ensure that it was retentive and did not rock when pressure was applied over the displaceable areas. Thus in this way the flabby tissue was recorded by mucostatic technique in undisplaced manner and rest of the firm tissue is recorded by mucocompressive technique. The impression was cast in dental stone, paying careful attention in preserving the bordered moulded sulcus area. The denture fabrication was continued in the conventional manner and the fabricated complete denture was inserted and delivered to the patient (fig 5).

Fig 2

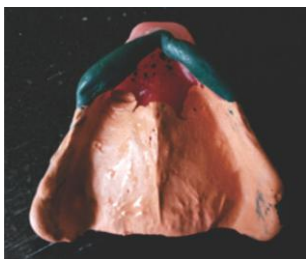


Fig 3:



Fig 4:

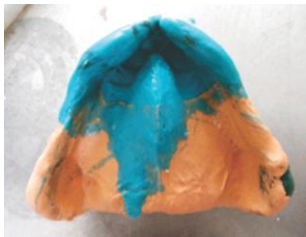


Fig 5:



The patient was called for a follow up one day after the denture insertion and then after a gap of one week. The patient was comfortable with the new prosthesis and on examination no abnormalities were detected and follow up period was uneventful.

DISCUSSION:

The ultimate goal of any prosthodontic treatment is to restore the form, function, and esthetics of the patient.

Excessive forces due to unstable occlusion can lead to the formation of flabby ridge in an edentulous arch which provides poor support for a denture. This is caused by replacement of underlying supporting bone by fibrous tissue and is associated with marked fibrous inflammation⁹. This condition was first discussed by Watson in 1970 and he had described an impression technique for maxillary fibrous ridge. Later Ellsworth Kelly in 1972 described the changes caused by maxillary complete denture opposed by mandibular anterior teeth and distal extension RPD and termed it as combination syndrome. This includes clinical features such as loss of bone from anterior maxilla with concurrent fibrous tissue hyperplasia, over growth of maxillary tuberosity, extrusion of mandibular natural dentition and papillary hyperplasia of hard palate.³

A variety of techniques have been suggested to circumvent the difficulty of making a denture to rest on a flabby ridge. The multitude of impression techniques that have been suggested are:

1. Window technique⁴
2. One part impression technique (a selective perforation tray)¹⁰
3. Controlled lateral pressure technique¹⁰
4. Palatal splinting using two part tray system⁵
5. Selective displacement/selective composition flaming technique¹⁰

Using the palatal splinting technique it is conceivable that a degree of distortion, although minimal, may occur by anterior distortion during the first stage and compression of the ridge at second impression stage. The two stage technique is the closest of the described techniques to recording the fibrous ridge in its undisplaced position and would appear to have the highest number of advocates in the literature reviewed.

SUMMARY

The technique described does not involve extra clinical stages in the construction of a complete denture, thereby keeping clinical time to a minimum. The impression technique can be accomplished relatively quickly and uses materials with which the general dental practitioner is

already familiar. Polyvinylsiloxanes are dimensionally stable and they are also less brittle than 'plaster of Paris' and are relatively easy to handle.

CONCLUSION

This article describes a simple technique for making wash impression of maxillary anterior highly displaceable ridge with low viscosity polyvinyl siloxane. Consideration has been given to the choice of impression materials as well as to the design of the impression tray to minimize the amount of pressure exerted on the displaceable tissues during the impression-making procedure. The materials used are readily available and used in general dental practice. The technique does not require additional clinical visits compared to fabrication of a conventional complete denture.

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