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Journal of MaxilloFacial Science and Research (JMFSR, ISSN 2348-9030) is the official publication of the PMS College of Dental Science and Research. The journal started with the aim of providing our students and faculty a platform to showcase their research projects and interesting clinical cases. We also accept articles from outside the institution on topics related to all the dental specialities and related sciences. Authors are encouraged to submit research papers, case reports (new / interesting / rare cases/ cases with clinical significance and interdisciplinary cases), and short communications. Special effort is made to ensure rapid publication. Articles written in English alone will be accepted provided they have not been and will not be published elsewhere. The editor and or its publisher cannot be held responsible for errors or for any consequences arising from the use of the information contained in this journal. The appearance of advertising or product information in the various sections in the journal does not constitute an endorsement or approval by the journal and or its publisher of the quality or value of the said product or of claims made for it by its manufacturer.

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A VISION FULFILLED

The grace of God Almighty is best reflected in parents with integrity and children who strive hard to realize their dreams. The late **Sri P. M. Shahul Hameed B.A (1920-1995)** gave his children the best gift in life, quality education, at a time when few realized the wonders that education could work in the lives of men and women. The PMS College of Dental Science and Research is a monument to the memory of that great soul. College was established in 2002 under the able guidance of **Dr. P.S.Thaha,** a visionary with over three decades of experience in dental education and patient care in India and abroad. This college is the first self- financing dental institution in Kerala State, the first to achieve the ISO 9001-2000 certification and NAAC accreditation among dental colleges in Kerala. In addition to undergraduate and postgraduate courses, college is currently conducting PhD programs in different specialities of dentistry recognized by Kerala University of Health Sciences and NITTE University. The college provides an excellent environment for students as well as faculty in developing knowledge, clinical skills and attaining academic excellence. PMS College is currently ranked among the best 40 dental institutions of the country as per the survey conducted by INDIA TODAY.

OBSCURE FIBROTIC CONDITIONS : A MAJOR DETERMINANT OF TOTAL DISEASE BURDEN.

Fibrosis is the result of chronic inflammatory reactions induced by a variety of stimuli including persistent infections, autoimmune reactions, allergic responses, chemical insults, radiation, and tissue injury. Although current treatments for fibrotic diseases such as Idiopathic pulmonary diseases (IPD), liver cirrhosis, systemic sclerosis, progressive kidney diseases (PKD), and cardiovascular fibrosis typically target the inflammatory response, there is accumulating evidence that the mechanisms driving fibrogenesis are distinct from those regulating inflammation[1]. Some studies have suggested that ongoing inflammation is needed to reverse established and progressive fibrosis. The key cellular mediator of fibrosis is the myofibroblast, which when activated serves as the primary collagen-producing cell. Myofibroblasts are generated from a variety of sources including resident mesenchymal cells, epithelial and endothelial cells in processes termed epithelial/endothelial - mesenchymal transition, (EMT / End MT) as well as from circulating fibroblast-like cells called fibrocytes that are derived from bone marrow stem cells. Myofibroblasts are activated by a variety of mechanisms including paracrine signals (from lymphocytes, and macrophages), autocrine factors secreted by myofibroblasts, and pathogen-associated molecular patterns produced by pathogenic organisms.

Chronic loss of organ function in most organs, including bone marrow, heart, intestine, kidney, liver, lung, and skin is associated with fibrosis, contributing to an estimated one-third of natural deaths worldwide. Effective therapies to prevent or even reverse existing fibrotic lesions are not yet available in any organ. There is hope that an understanding of common fibrosis pathways will lead to the development of anti-fibrotic therapies that are effective in all those tissues in the future. These conditions are called "obscure" due to the obscurity as regards its causation, along with the common pathways shared in its progression.

In the maxillo-facial context, Oral submucous fibrosis (OSF) being a prototype of pathologic fibrosis, remains enigmatic as regards its causation. The connective tissue production is permanent and there is no reversal of the condition even after cessation of the habit of areca nut usage, the prime suspect in its causation. The bulk of the connective tissue consists of type-I collagen and its formation does not appear to be caused by excessive proliferation of fibroblasts[2]. The effect of areca nut extracts on in-vitro fibroblasts varies on a concentration gradient, predominantly suppressing, rather than stimulating the growth of the cells[3]. It has been proposed that fibroblasts are functionally heterogeneous, the composition of any given normal or diseased connective tissue being a consequence in part of its mixture of fibroblast subtypes and density. Subtype deletion or amplification can result from selective cytotoxic or mitogenic responses induced by the binding environmental ligands (Narayanan AS et al, 1978). Against this backdrop, we proposed a few de-novo attributes, hitherto unreported, and seem to be of relevance in the pathogenesis of OSF[4].

It is controversial whether advanced fibrosis can be reversed to the extent that normal tissue architecture can be restored completely. Indeed, there is substantial evidence that, if fibrosis is sufficiently advanced, reversal is no longer possible. Recent studies demonstrated that macrophage depletion at the onset of fibrosis resolution could retard ECM degradation. This suggests that macrophages are essential for initiating ECM degradation, perhaps by producing MMPs. Therefore, it might be possible to reverse what was once thought to be irreversible fibrosis. One way to restore homeostasis could be to eliminate the collagen-producing cells, therefore they might prove successful for a wide variety of fibroproliferative disorders.[5]

There is a growing list of novel mediators and pathways that could be exploited in the development of anti-fibrotic drugs. The most difficult obstacle will be to design effective clinical trials with well-defined clinical endpoints. Non-invasive techniques, such as serum markers, improved imaging techniques, or other clinical features that can quickly quantify changes in the natural history of the disease (rate of disease progression) are desperately needed. Host genetic factors can also be exploited to determine the relative risk of developing fibrosis. Nearly 45% of all deaths in the developed world are attributed to some type of chronic fibroproliferative disease. This reveals the importance, rather urgency, in formulating newer anti-fibrotic drugs, which can be used safely and with predictive curative effects on the management of these enigmatic groups of disorders haunting human health.

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Multi-omics in Oral microbiology Research and Its Application in Dentistry- An introductory review

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ABSTRACT

The integration of omics technologies has revolutionized dental research, providing comprehensive insights into the complex interactions between oral microorganisms and host tissues. This review explores the historical development and contemporary applications of genomics, proteomics, metabolomics, culturomics, and transcriptomics in the study of oral microbiology and their implications for dentistry. Beginning with the milestones in genomic research that identified genetic predispositions and pathogenic mechanisms of oral diseases, the review highlights how high-throughput sequencing and databases like the Human Oral Microbiome Database have advanced our understanding of microbial diversity and disease associations. The advent of proteomics and techniques such as Matrix Assisted Laser Desorption Ionization-Time of Flight Mass Spectrometry has enabled the identification of protein markers and metabolic pathways involved in oral diseases, offering new diagnostic and therapeutic avenues. Metabolomics, through the analysis of metabolic profiles in oral biofluids, has identified biomarkers for early diagnosis and disease monitoring. Culturomics has expanded our knowledge of the oral microbiome by uncovering novel microbial species, while transcriptomics, particularly with single-cell RNA sequencing, has provided detailed insights into gene expression dynamics and host-pathogen interactions. The review underscores the transformative potential of these high-end omics technologies in precision dentistry, highlighting the challenges and future perspectives in integrating multi-omics data for personalized treatment and improved clinical outcomes.

Key Words: Multi-omics, oral microbiome, culturomics, genomics

INTRODUCTION

Oral microbiology is an ever-expanding scientific frontier and a rapidly evolving area with groundbreaking discoveries frequently reshaping our understanding of microbial life and its application. The oral microbiome not only plays a pivotal role in maintaining oral health and disease development but also is associated with various systemic diseases as well, causing significant threats to the health sector and mankind.[1]

The oral cavity exhibits a plethora of microorganisms with more than 700 prokaryotic taxonomic groups. This includes both cultivable and non- cultivable species as well as named and unnamed organisms. Of the whole 14% of the organisms were cultivable but belonged to an unnamed category. 54 % of the microorganisms are cultivable and named species. But the remaining 36 % are uncultivable phylotypes.[2] Initially, 16S rRNA gene sequencing was used to characterize oral microbes, and 16S rRNA GenBank accession numbers referenced most unnamed oral Microbiome Database (HOMD) and gives the scientific community a body-site-specific comprehensive database for more than 600 proka ryote species present in the human oral cavity.[3]

Though the traditional microbiological and molecular biology techniques have contributed much to oral microbiology research, the complexity and diversity of microbial systems highlight the disadvantages of the lack of cultivation methods for many oral microbes and difficulties in evaluating the community dynamics among human microbiota. Earlier most of the scientific community believed that 80% of the unclassified bacteria could not be cultured, but Lagier et al. reintroduced in 2015 the culture approach, 'Microbial culturomics', which enabled the isolation and genome sequencing of new bacterial species.[4]

Challenge of understanding the complexity of the microbial communities in the oral cavity requires a comprehensive approach, employing culturomics and metagenomics has considerably enhanced the

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knowledge front in oral micrology.[5] Further moving to the forefront, an integrated omics approach including proteomics, metabolomics, and transcriptomics will provide a cutting-edge technology to push the boundaries of oral microbiology research, providing deeper insights into oral microbiome, ecology, evolution, and its potential association with human physiology and therapeutics. The Figure 1 shows the various avenues of multi-omics research in oral microbiology.

This review delves into each of these omics technologies, highlighting their contributions and applications in dental research, and their potential to revolutionize the field of oral microbiology

CULTUROMICS

The standard cultivation methods are inefficient in cultivating the complete oral flora due to their diverse nutritional and metabolic requirements, slow-growing pattern, low abundance, etc. For instance, some bacteria in the plaque depend on the metabolic products and chemical signals produced by the other co-inhabiting microbes rendering them unable to grow in monocultures. Though novel culture techniques such as co-culture methods using helper organisms are used to grow some uncultivable strains, but still require thorough standardization, identification, and characterization procedures.[6]

Culturomics combines high-throughput culturing techniques with modern genomic sequencing. It has transformed the study of the human microbiome, including oral microbiota. Hence it is a rebirth of culture techniques for culture-based identification of unknown microorganisms and hence is an emerging tool for retrieving the "difficult to culture" category of oral microbes. This approach allows the cultivation and identification of a wide array of microorganisms, including those previously deemed unculturable.[7] It has evolved as a means for rapid colony identification. It is characterized by a high-capacity approach, which integrates different selective and enriched culture conditions and identification technologies.

Culture-based methods using specific culture media such as Yeast extract-casein hydrolysate fatty acids (YCFA) culture medium[8], use of specific conditions and media for targeted culture, thermal shocks, use of antioxidants for improved growth, bacterial coculture, selective media based on an antibiotic, antimicrobial agents and phages, genomic reverse culture techniques, etc. are employed.[9]

By employing diverse culture conditions and integrating genomic sequencing, culturomics provides comprehensive insights into the diversity and functionality of oral microorganisms. 16s rRNA gene sequencing has been widely used in oral microbial diversity studies and for understanding their composition and diversity during health and disease conditions such as periodontitis, dental caries, and oral cancers.[10] It is widely employed for diseases and treatment monitoring processes such as assessing the impact of dental treatments, antibiotics, or probiotics on the oral microbiome. This technique also enables the investigation of the spread and evolution of oral pathogens within populations.

Recent advancements in culturomics have facilitated the discovery of novel bacterial species within the oral cavity, expanding our understanding of oral microbial ecology and its implications for oral health and disease.

The application of culturomics in dental research has led to significant breakthroughs in the identification and characterization of pathogenic microorganisms associated with oral diseases.[11,12] For instance, culturomics has been utilized to isolate and characterize novel strains of *Porphyromonas gingivalis* and *Fusobacterium nucleatum,* key pathogens implicated in periodontal disease. These discoveries have provided deeper insights into the virulence factors and metabolic pathways of these pathogens, informing the development of targeted therapeutic strategies. Additionally, culturomics has revealed the presence of previously unknown commensal bacteria that play protective roles in the oral cavity, contributing to the maintenance of oral health and the prevention of disease.[13,14]

Furthermore, culturomics has significant implications for the development of personalized dental treatments.[15] By providing a detailed understanding of the microbial composition and dynamics within the oral cavity, culturomics enables the identification of individual-specific microbial signatures associated with oral health and disease. This information can be leveraged to design personalized therapeutic interventions, such as probiotics tailored to restore a healthy oral microbiome or targeted antimicrobial therapies to eliminate pathogenic bacteria.

The integration of culturomics with other omics approaches, such as genomics and metabolomics, enhances the understanding of the complex interactions between oral microorganisms and their host, paving the way for innovative approaches in preventive and therapeutic dentistry. As culturomics continues to evolve, its application in oral microbiology promises to advance the field of dentistry significantly, improving patient outcomes through more precise and effective treatments.

GENOMICS

Genomics involves the study of the complete set of DNA within an organism, providing insights into the genetic makeup and potential functionalities of microorganisms. In oral microbiology, genomics has revolutionized the understanding of microbial diversity and the genetic basis of pathogenicity. Advanced techniques such as next-generation sequencing (NGS) and whole-genome sequencing (WGS) have enabled the comprehensive analysis of the oral microbiome, identifying specific strains and genetic variations associated with oral diseases. For instance, metagenomic sequencing has revealed significant insights into the microbial dysbiosis associated with dental caries and periodontal disease. This technology allows researchers to identify not only the microbial species present but also their functional capabilities, leading to a better understanding of the microbial ecology within the oral cavity.[16,17]

Recent genomic studies have highlighted the importance of understanding the genetic interactions between oral pathogens and the host. For example, whole-genome sequencing of *Streptococcus mutans* has provided detailed information on the genetic determinants involved in biofilm formation and acid tolerance, key factors in the development of dental caries.[18] Additionally, comparative genomics has been used to study variations within species of *Porphyromonas gingivalis*, a major pathogen in periodontal disease, uncovering strain-specific virulence factors that contribute to its pathogenicity.[19] These findings are crucial for developing targeted therapeutic strategies and improving the management of oral diseases.

Moreover, the integration of genomic data with other omics approaches, such as transcriptomics and metabolomics, has provided a more holistic view of the oral microbiome and its interactions with the host. This multi-omics approach has led to the identification of potential biomarkers for early diagnosis and personalized treatment of oral diseases. For example, metagenomic and transcriptomic analyses have been used to identify gene expression patterns associated with oral squamous cell carcinoma, providing new insights into the role of the oral microbiome in cancer development.[20] As genomic technologies continue to advance, their application in oral microbiology holds great promise for enhancing the understanding of microbial ecology, pathogenic mechanisms, and the development of innovative therapeutic interventions.[21]

PROTEOMICS

Proteomics, the large-scale study of proteins, plays a crucial role in understanding the functional molecules within cells. In the context of oral microbiology, proteomics provides vital insights into the protein profiles of oral microorganisms and their interactions with the host. Advanced techniques such as mass spectrometry (MS), particularly matrix-assisted laser desorption/ionization-time of flight (MALDI-TOF) MS, have revolutionized the field by enabling rapid and precise identification of microbial species.[22] MALDI-TOF MS is extensively used for diagnosing oral infections, allowing for the swift identification of bacterial and fungal pathogens directly from clinical samples. This technique not only enhances diagnostic accuracy but also guides appropriate treatment strategies, thereby improving patient outcomes.[23]

Recent advancements in high-end proteomics have facilitated the identification of biomarkers for various oral diseases. For instance, quantitative proteomics approaches, such as tandem mass tag (TMT) labeling and isobaric tag for relative and absolute quantitation (iTRAQ), have been employed to profile the salivary proteome. These studies have identified specific proteins associated with periodontal disease, dental caries, and oral cancer, offering potential biomarkers for early diagnosis and monitoring disease progression.[23,24] Moreover, proteomic analyses of gingival crevicular fluid (GCF) have revealed protein signatures that reflect the inflammatory status of periodontal tissues, aiding in the assessment of disease severity and response to therapy.[25]

Furthermore, the integration of proteomics with other omics technologies, such as genomics and

FIGURE 1: MULTI-OMICS RESEARCH IN ORAL MICROBIOLOGY.

metabolomics, has provided a comprehensive understanding of the molecular mechanisms underlying oral health and disease. For example, proteomic studies have elucidated the role of specific bacterial proteins in biofilm formation, virulence, and antibiotic resistance. By combining proteomic data with genomic and metabolomic profiles, researchers have identified key metabolic pathways and regulatory networks involved in oral diseases. This integrated approach has not only advanced the understanding of pathogenic mechanisms but also facilitated the development of novel therapeutic targets and personalized treatment strategies for oral diseases.[26] As high-end proteomic technologies continue to evolve, their application in oral microbiology and dentistry offers significant potential to enhance disease management, therapeutic and preventive approaches.

METABOLOMICS

Metabolomics, the comprehensive analysis of metabolites within biological systems, has significantly advanced the understanding of oral health and disease. High-end metabolomic techniques, such as nuclear

magnetic resonance (NMR) spectroscopy and mass spectrometry (MS), enable the detailed characterization of the metabolic profiles of oral biofluids, tissues, and microbiota. These technologies provide insights into the biochemical pathways and metabolic interactions between the host and oral microorganisms .[26] For instance, metabolomic profiling of saliva and gingival crevicular fluid (GCF) has identified specific metabolic signatures associated with periodontal disease, dental caries, and oral cancer. These findings have facilitated the identification of potential biomarkers for early diagnosis and disease monitoring, thereby enhancing patient care and treatment outcomes.[27]

Recent studies utilizing high-end metabolomics have revealed the complex metabolic interactions within the oral microbiome. For example, the metabolic profiling of dental plaque has identified key metabolites produced by pathogenic bacteria that contribute to biofilm formation and acid production, which are critical in the development of dental caries. Similarly, metabolomic analyses of periodontal pockets have uncovered metabolic alterations associated with periodontal inflammation and tissue destruction. These insights into the metabolic activities of oral pathogens provide a deeper understanding of disease pathogenesis and potential therapeutic targets. Moreover, integrating metabolomic data with genomic and proteomic analyses offers a holistic view of the molecular mechanisms underlying oral diseases, paving the way for the development of novel diagnostic and therapeutic approaches.[28]

The application of metabolomics in oral microbiology and dentistry has also extended to the study of host-microbiome interactions and systemic health implications. For instance, metabolomic studies have investigated the impact of systemic conditions, such as diabetes and cardiovascular diseases, on the oral microbiome and its metabolic output. These studies have demonstrated that metabolic dysregulation in systemic diseases can influence the composition and function of the oral microbiome, thereby contributing to oral disease progression. Additionally, metabolomic profiling has been used to assess the efficacy of dental treatments and interventions, such as antimicrobial therapies and probiotics, by monitoring changes in the metabolic profiles of the oral microbiome. This approach enables the evaluation of treatment outcomes and the optimization of therapeutic strategies for better clinical results.[25] As metabolomic technologies continue to evolve, their application in oral microbiology and dentistry position disease prevention, diagnosis, and personalized treatment. Highlights considerable potential to advance

TRANSCRIPTOMICS

Transcriptomics, the study of RNA transcripts produced by the genome, is pivotal in understanding gene expression and regulation in oral microorganisms and host tissues. High-throughput techniques like RNA sequencing (RNA-seq) have enabled comprehensive profiling of the transcriptome, providing insights into the functional dynamics of oral microbiomes in health and disease. RNA-seq allows for the identification and quantification of both coding and non-coding RNAs, revealing the complex regulatory networks and metabolic pathways active in oral pathogens and host cells.[29] This technology has been instrumental in uncovering the gene expression changes associated with periodontal disease, dental caries, and oral cancer, offering new perspectives on the molecular mechanisms underlying these conditions.[30] In dental research, transcriptomics has been employed to study the interaction between oral pathogens and host tissues. For example, RNA-seq analysis of gingival tissues infected with *Porphyromonas gingivalis* has identified differential expression of genes involved in inflammation, immune response, and tissue remodeling, shedding light on the pathogenic mechanisms of periodontal disease.[31] Similarly, transcriptomic profiling of *Streptococcus mutans* during biofilm formation has elucidated the genetic factors contributing to its cariogenicity, aiding in the development of targeted antimicrobial therapies. Furthermore, studies have shown that transcriptomic changes in oral epithelial cells exposed to carcinogenic bacteria can reveal biomarkers for early detection and prognosis of oral cancers.[32]

Recent advancements in single-cell RNA sequencing (scRNA-seq) have further refined our understanding of the oral microbiome by enabling the analysis of gene expression at the single-cell level. This technology has allowed researchers to dissect the heterogeneity within microbial populations and host tissues, providing detailed insights into cellular interactions and functional diversity. For instance, scRNA-seq has been used to characterize the immune cell landscape in inflamed gingival tissues, identifying distinct immune cell subsets and their roles in disease progression.[33]

The integration of transcriptomic data with other omics approaches, such as proteomics and metabolomics, enhances the ability to construct comprehensive models of oral disease pathogenesis and identify novel therapeutic targets. These high-end transcriptomic technologies continue to drive innovations in personalized dental care, improving diagnostic accuracy and treatment efficacy.[34]

CONCLUSION AND FUTURE PERSPECTIVES

The integration of high-end omics technologies such as microbial culturomics genomics, proteomics, metabolomics, and transcriptomics could further revolutionize the study of oral microorganisms and their implications for dental health. These advanced methodologies provide comprehensive insights into the complex microbial ecosystems within the oral cavity and their interactions with the host. Genomics has illuminated the genetic foundations of microbial pathogenicity and host-microbiome interactions, offering new avenues for targeted therapeutic interventions. Proteomics has identified critical protein markers and metabolic pathways associated with oral diseases, while metabolomics has elucidated the biochemical signatures of health and disease states. Culturomics has expanded the microbial repertoire, uncovered novel species and enhanced our understanding of microbial diversity. Transcriptomics has revealed the dynamic gene expression profiles underlying disease progression and host response. Collectively, these omics approaches have significantly advanced the field of oral microbiology and dentistry, providing robust tools for diagnosis, treatment, and prevention of oral diseases.

Despite these advancements, several challenges and opportunities lie ahead in the application of omics technologies in dental research. One major challenge is the integration and interpretation of multi-omics data to construct a holistic view of oral health and disease. The complexity of microbial interactions and the vast amount of data generated require sophisticated bioinformatics tools and multi disciplinary approaches. Moreover, the variability in microbial communities among individuals necessitates personalized approaches to diagnosis and treatment. Future research should focus on developing standardized protocols and comprehensive databases to facilitate the comparison and integration of omics data across studies. Additionally, advancements in single-cell omics and real-time sequencing technologies hold promise for unraveling the spatial and temporal dynamics of the oral microbiome at an unprecedented resolution.

The future of dental research and clinical practice will increasingly rely on the integration of omics technologies to achieve precision dentistry. By combining insights from genomics, proteomics, metabolomics, culturomics, and transcriptomics, researchers can develop more accurate diagnostic tools and personalized therapeutic strategies. For instance, personalized probiotics and tailored antimicrobial therapies based on individual microbial profiles could become standard practice. Moreover, the identification of early biomarkers for oral diseases through omics approaches can lead to preventive interventions, reducing the burden of chronic oral conditions. As omics technologies continue to evolve and become more accessible, their widespread application in dentistry will undoubtedly transform the field, leading to improved oral health outcomes and enhanced quality of life for patients.

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EARLY LUMEN FORMATION IN BAY CYST- A CASE REPORT

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ABSTRACT

A periapical cyst is a common development in long-standing, untreated periapical granuloma. The cyst's epithelial lining is derived from the rests of Malassez, the epithelial islands remaining after root formation during odontogenesis and normally present in the apical periodontal membrane. They exist in two structurally distinct classes namely those containing cavities completely enclosed in epithelial lining (periapical true cysts) and those containing epithelium-lined cavities that are open to the root canals (periapical pocket cysts/bay cyst). Here we report a case of an early lumen formation of periapical cyst which is a bay cyst. This is a chronic inflammatory lesion with an epithelium-lined lumen that directly communicates with the root canal system. It's distinct from a true cyst, which is a three-dimensional cavity lined with epithelium and lacks communication with the canal system. The distinction between a bay and a true cyst is important from the standpoint of healing. While bay cyst can be treated with endodontic therapy, true cyst requires surgical excision.

Keywords: Bay cyst, Pocket cyst, Periapical cyst

INTRODUCTION

Large periapical lesions, regardless of whether they are granulomas, abscesses/ cyst, are primarily caused by root canal infections.[1] In response to root canal infection, the periradicular tissues mount an immune response that may give rise to bone resorption and granuloma formation. With the passage of time, lesion may become epithelialized as the epithelial cell rest of Malassez start to proliferate in the granuloma. Ultimately a cavity lined by epithelium is formed, which characterizes the apical cyst. Depending on the relationship of the cyst cavity with root canal via apical foramen, the apical cyst has been classified as "True" or "Bay" (also "Pocket") cyst.[2]

CASE REPORT

A 41-year-old male patient presented to the dental clinic, with a complaint of swelling in the lower left back tooth region since two months. Intraoral radiographic examination reveals well circumscribed radiolucency of size 7 x 8 mm involving periapical region of 48. Based on the clinical and radiographical examination the presumptive diagnosis was periapical granuloma. Surgical removal of the tooth and the periapical lesion was done under local anaesthesia and the excised specimen was sent for histopathological examination. On grossing, the periapical lesion measured 0.7 x 0.7 x 0.5 cm in size and on sectioning early lumen formation was noted. The lumen showed communication with the apical portion of root canal. (Figure 1a, 1b)

Figure 1a, 1b: Pathology of gross specimen showing small cystic lumen*

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Histopathology of the excised specimen showed small cystic lumen, cystic lining and connective tissue capsule. (Figure 2)

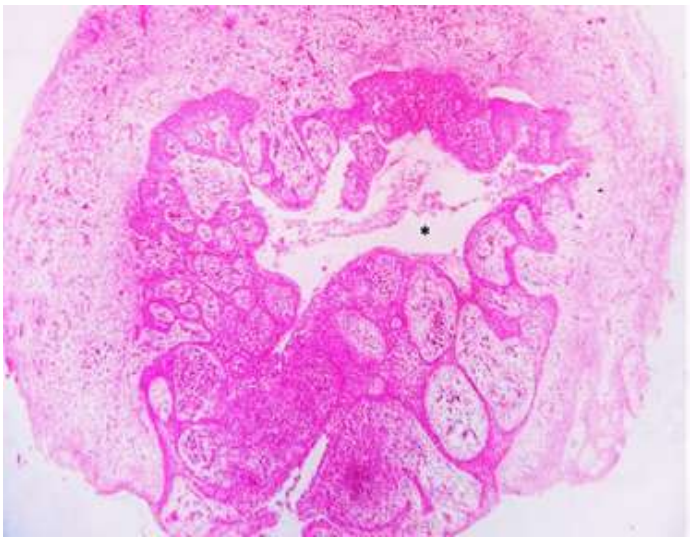

Figure 2: Small cystic lumen*, cystic lining and connective tissue capsule (4x magnification)

The lining was made up of non –keratinized stratified squamous epithelium exhibiting slender, elongated rete ridges, forming an arcading pattern. (Figure 3)

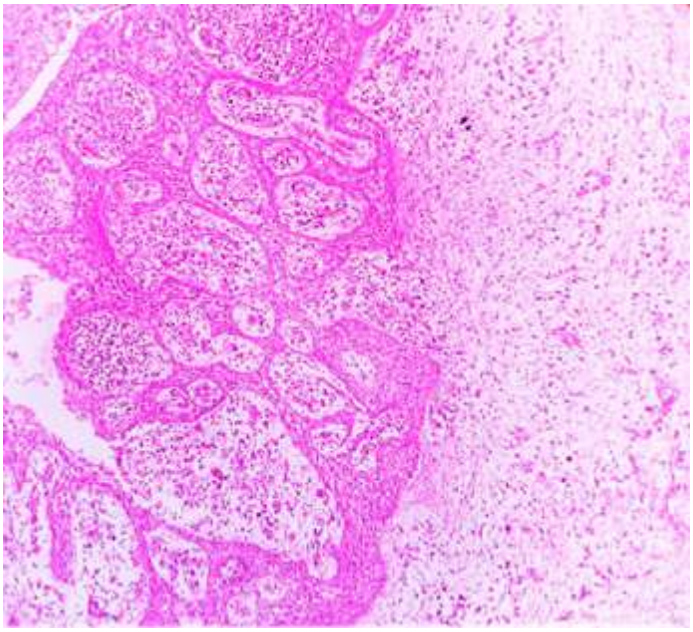

Figure 3: Arcading proliferation of non-keratinized stratified squamous epithelium and inflamed connective tissue (10x magnification)

The cystic lumen consists of eosinophilic fibrin material, foamy inflammatory cells and extravasated RBCs. (Figure 4a, 4b)

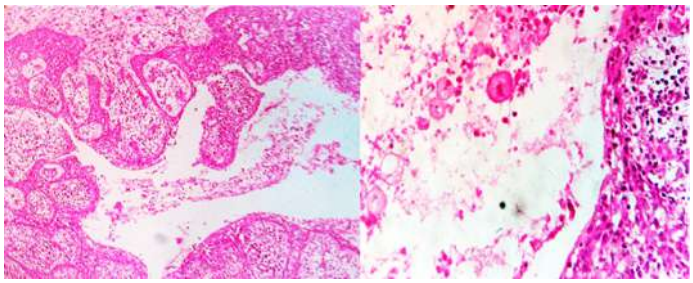

Figure 4a, 4b: Small cystic lumen consists of eosinophilic fibrin material, foamy inflammatory cells and extravasated RBCs, cystic lining (10x magnification). Cystic lumen consists of eosinophilic fibrin material, foamy inflammatory cells and extravasated RBCs.

The connective tissue capsule shows dense mixed inflammatory cell infiltrate, predominantly lymphocytes and plasma cells. Numerous endothelium lined vascular spaces and extravasated RBCs were noted within connective tissue capsule. The final diagnosis was given as periapical- bay cyst.

DISCUSSION

The cyst is defined as "a pathological cavity having fluid, semifluid or gaseous contents and which is not created by the accumulation of pus."[3] Most cysts, but not all, are lined by epithelium. Periapical cyst considered as inflammatory cyst because of the caries tooth or trauma. The etiology of periapical cyst focuses on trauma or dental caries, which ends up in pulpal necrosis where the infection travels to the tooth apex of the root and form periapical granuloma, or and periapical cyst secondary to the provocation of epithelial rest of Malassez through the local inflammation. Periapical cysts are considered to be the most common cysts, 52–68% of all the cysts affecting the jaws, around 9% are true cysts and 6% pocket cysts.

The present case report presents an early luminisation of periapical- bay cyst with communication to the root canal lumen. The pathogenesis has been described in three phases; phase of initiation, cyst formation, and enlargement.[4] However, two theories exist in cyst cavity formation. The "nutritional deficiency theory" is based on devoid of nutritional deficiency and the "abscess theory" that the proliferating epithelium lines an abscess cavity formed by tissue necrosis and lysis because of the innate nature of the epithelial cells to cover exposed connective tissue surfaces then the cyst grows by osmosis. Later diffuses into the cyst

cavity to raise the intraluminal hydrostatic pressure well above the capillary pressure. The increased intracyst pressure may lead to bone resorption and expansion of the cyst. Pocket cysts with lumen open to the necrotic root canal can become larger than usual because osmotic pressure plays a potential factor in the development of radicular cysts.[5]

Clinically a patient with periapical cyst has no symptom until there is an acute inflammatory exacerbation, the cyst reaches a large size, followed by swelling. Mild sensitivity may be noted in the affected area. Movement and mobility of adjacent teeth can occur as the cyst enlarges. Radiographic feature reveals a well-defined unilocular radiolucency located periapical to a tooth with pulpal involvement. Distinguishing between true cysts and bay cysts clinically involves evaluating key factors. True cysts, typically seen as well-defined radiolucent lesions with bone expansion at the tooth apex, often cause symptoms and have a poor response to endodontic treatment alone, requiring surgery and carrying a higher recurrence risk. Bay cysts, appearing as smaller radiolucencies near the root apex, may be asymptomatic or cause mild discomfort due to periapical inflammation. They usually respond well to endodontic treatment, with a lower recurrence rate.[6]

On histopathological examination, the lesion classified as bay cyst shows an apical inflammatory lesion with epithelium lining a cavity but interrupted by the root apex protruding into the cavity resulting in a direct opening into canal lumen.[2] Most of the periapical cysts are lined wholly or partly, by nonkeratinized-stratified squamous epithelium, this lining may be discontinuously ranging from 1 to 50 cell layers thick. In the early stages, the epithelial lining may show proliferation and arcading pattern with intense inflammatory infiltrate. In mature or long standing cysts, the lining becomes quiescent and fairly regular with a certain degree of differentiation to resemble simple stratified squamous epithelium. Keratin formation occurs rarely, if present, affects only a part of the cyst wall. In the proliferating epithelium, the inflammatory cell infiltrate consists predominantly of polymorphonuclear leukocytes. The adjacent fibrous capsule is infiltrated by chronic inflammatory cells.[6]

Understanding whether a lesion is a true cyst or a bay cyst guides clinicians in selecting the most appropriate treatment approach. True cysts often necessitate more extensive interventions, such as surgical enucleation or marsupialization, to completely remove the cystic structure. Conversely, bay cysts, being inflammatory in nature, may respond favorably to less invasive treatments like root canal therapy or nonsurgical endodontic procedures. Additionally, accurately identifying the type of lesion helps predict prognosis, with true cysts typically presenting a higher risk of recurrence if not adequately treated. Moreover, differentiating between the two types of cysts aids in assessing the risk of complications, such as infection or bone destruction, associated with each condition. Equally important is the role of patient education, as providing clear explanations about the nature of the lesion empowers patients to make informed decisions about their treatment options and fosters better compliance with recommended interventions.[7]

CONCLUSION

In conclusion, bay cyst can be treated with endodontic therapy and true cyst requires surgical excision. Distinguishing between true cysts and bay cysts is essential for effective treatment planning, minimizing complications, and promoting patient-centered care in dental and endodontic practice.

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PINK AESTHETICS UNDER MAGNIFICATION – A CASE REPORT ON GINGIVAL RECESSION WITH FREE GINGIVAL GRAFT

Nivedha Nedumaran[1], Kaarthikeyan Gurumoorthy[2*]

ABSTRACT

The aim of this case study was to present a novel approach involving a free gingival graft method, aimed at achieving enhancement of vertical soft tissue coverage in the lower front tooth region under magnification. A 25-year-old female patient underwent the free gingival graft procedure in the anterior mandibular region. Impressively, after one month, there was noticeable improvement in vertical dimensions of the gingival tissue. Suturing was done with the help of magnification. The patient expressed satisfaction with this outcome.

Keywords: Gingival recession, graft, keratinised tissue width, microsurgery, tissue transplantation.

INTRODUCTION

Gingival recession involves the apical migration of free gingival margin commonly due to low vestibular depth, periodontal disease, aggressive tooth brushing, and various other anatomical factors[1]. With the increasing concerns among patients with gingival recession often express aesthetic concerns due to the noticeable exposure of the tooth roots. This can lead to feelings of self-consciousness and dissatisfaction with their smile's appearance. The recession may cause uneven gingival margins or elongated teeth, affecting overall facial harmony. Addressing these concerns often involves restoring gingival tissue to achieve a more pleasing smile aesthetically[2]. Gingival recession overall also leads to tooth sensitivity, aesthetic concerns, and potential tooth root decay. Treatment options vary depending on severity and underlying causes.

In the recent decades, the evolution of microsurgery has revolutionized the treatment of gingival recession by offering precise and minimally invasive techniques. Utilizing specialized instruments and magnification, microsurgery allows for meticulous manipulation of delicate gingival soft tissues with minimal trauma[3]. This approach enables finer incisions, more precise flap elevation, and enhanced tissue grafting, resulting in reduced postoperative discomfort, faster healing, and superior aesthetic outcomes compared to traditional techniques.

Treating gingival recession with a microscope offers several advantages. Firstly, it provides enhanced visualization of the surgical field, allowing for more accurate assessment of tissue anatomy and precise treatment planning[4]. Secondly, the magnification provided by the microscope enables finer manipulation of delicate gingival tissues, leading to minimal trauma and improved surgical outcomes. Additionally, the use of a microscope allows for better control of bleeding during the procedure, resulting in reduced intraoperative complications. Moreover, the increased precision afforded by the microscope leads to better flap management and more precise placement of tissue grafts, ultimately contributing to superior aesthetic results and patient satisfaction[5-8]. Overall, the use of a microscope in gingival recession treatment offers improved surgical outcomes, reduced postoperative discomfort, and enhanced patient experiences compared to conventional techniques.

The various techniques to address gingival recession includes Connective Tissue Graft (CTG) that involves grafting tissue from the patient's palate to cover the exposed root surface, improving aesthetics and reducing sensitivity. Free Gingival Graft (FGG) that is similar to CTG but uses tissue directly from the palate, enhancing the thickness of the gingival tissue and protecting the roots. Each technique has its indications and benefits, and the choice depends on factors such as the extent of recession, tissue quality, patient preference, and the skill of the periodontist[9].

This case report focuses on Microsurgery performed for RT1 gingival recession using free gingival graft.

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CASE PRESENTATION:

A 25-year-old female patient presented with a chief complaint of gingival recession in the lower incisor region reported to Saveetha dental college and hospital, Chennai. She had no relevant medical or dental history. She also had no smoking or any drug history. On clinical examination, the recession was observed as a RT 1 defect located within the mandi bular incisor region in relation to 32 and 42 region.The recession exhibited dimensions of 2 mm in width and 3 mm in depth with a thin gingival biotype (Figure 1).

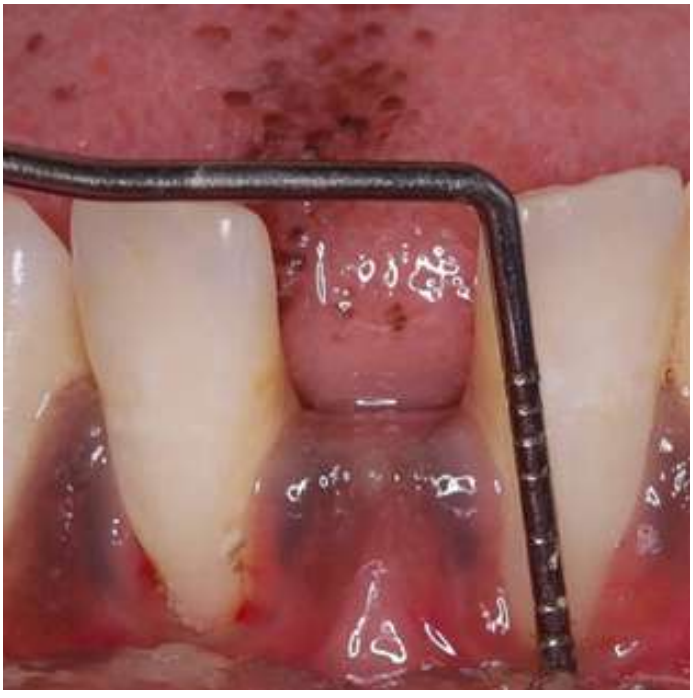

Figure 1: Pre-operative

Just prior to the commencement of the procedure, the patient was asked to rinse the mouth for two minutes with a solution containing 0.12% chlorhexidine digluconate. After ensuring a sterile environment, a local anesthetic containing 2% lidocaine with 1:100,000 epinephrine was administered. Following that, a releasing incision was carried out, strategically located between the mucogingival junction and the marginal tissue. Subsequently, a partial-thickness flap was meticulously elevated under microscope (Carl Zeiss AG- under 1x magnification), with the aim of maintaining proximity to the periosteum to ensure optimal bed preparation.

From the donor site, which is the right side of the patient in the region extending from the distal aspect of canine to the distal of second premolar of the maxilla, a Free Gingival Graft (FGG) of thickness 1.5 mm was meticulously (figure 2)

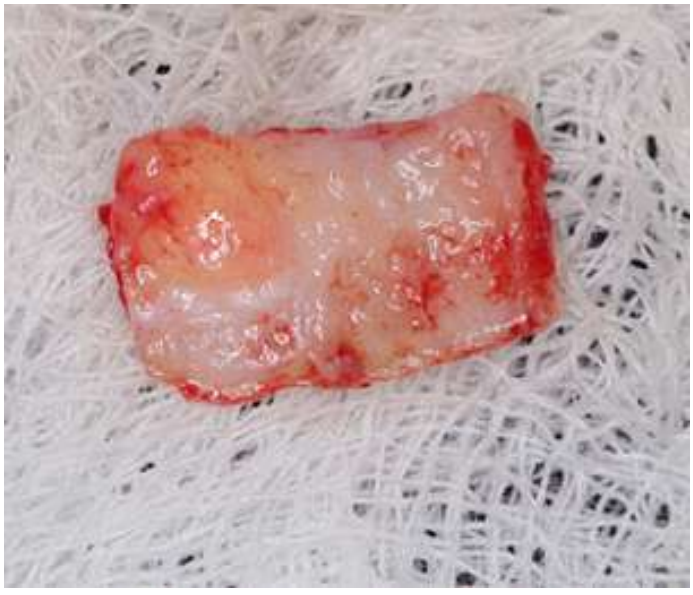

Figure 2: Free gingival graft harvested from palatal site

procured according to the size of the recipient site, which was measured using a foil template. Using absorbable 3-0 silk suture graft was carefully placed in an apical direction and attached to the periosteum with simple interrupted sutures. Subsequently, the graft was placed with meticulous care onto the sturdy and resilient periosteal bed, (figure 3)

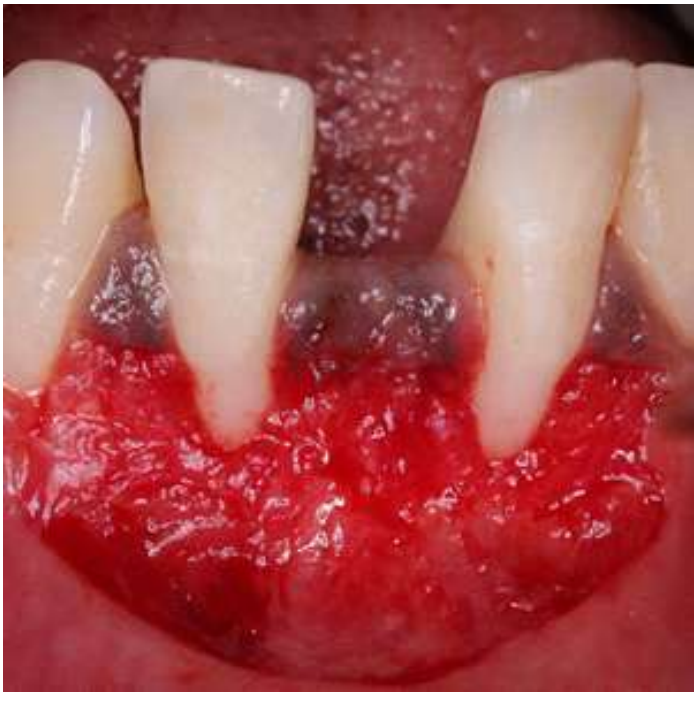

Figure 3: Recipient bed preparation under microscope (Carl Zeiss AG- under 1x magnification)

orienting the connective tissue side towards the periosteum. This positioning was executed to guarantee that approximately 3.5 mm of periosteum remained exposed. Sutures with a thickness of 6-0 Vicryl suture made from the copolymer of glycolic acid and lactic acid, were employed to secure the graft (figure 4)

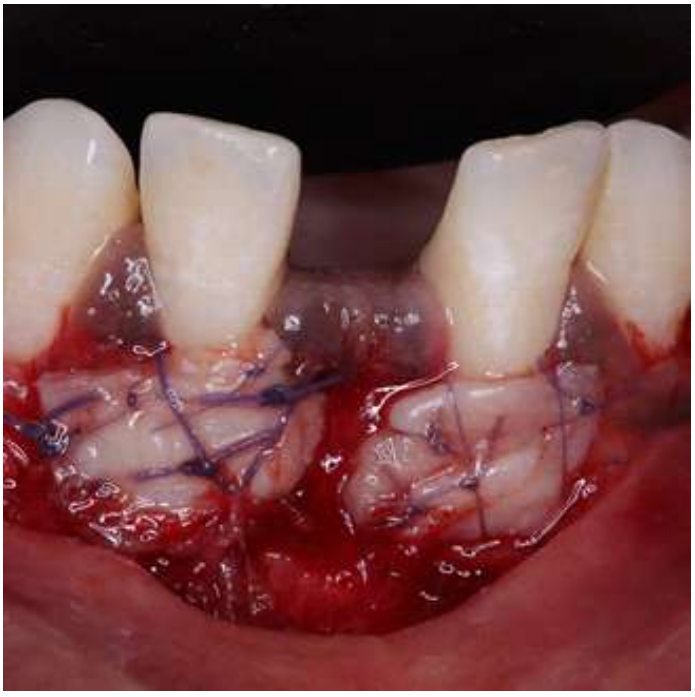

Figure 4: Free gingival graft placed in the recipient site and Holbrook Ochsenbein suturing done using 6-0 vicryl sutures.

The suturing technique of Holbrook and Oschenbein was used[10].

Following the procedure, the patient adhered to a standard postoperative regimen, which included taking amoxicillin 500 mg three times a day for five days, Ketorolac twice a day for five days, and using a 0.12% chlorhexidine digluconate mouthwash three times daily for next four weeks. During the initial four weeks of the postoperative period, the patient was advised to refrain from chewing or brushing the surgical area (figure 5)

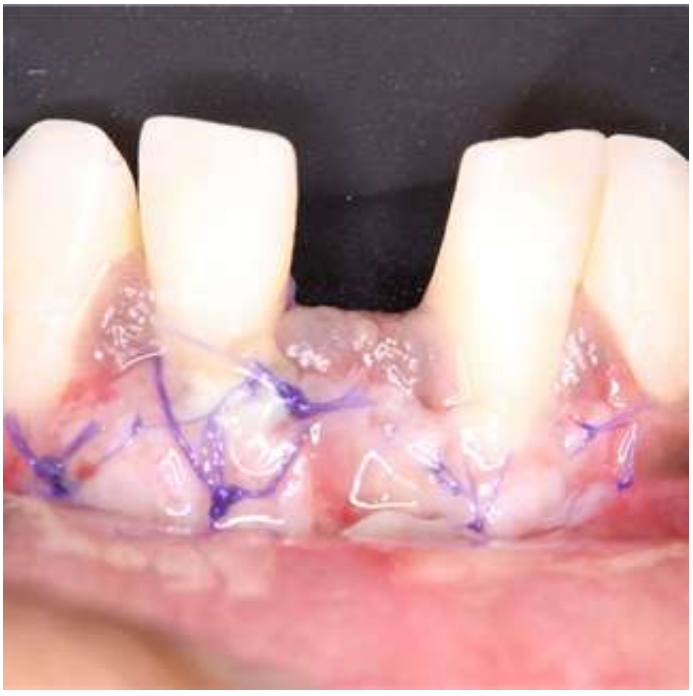

Figure 5: Post-operative after four weeks

The sutures were removed after 10 days. A comprehensive follow-up of both the recipient and donor site was done after one month. After 6 weeks another follow-up was conducted to evaluate the prognosis and outcomes of the procedure, in which a reduction in recession from 3 mm to 0.2 mm in height no difference in width was noted (figure 6).

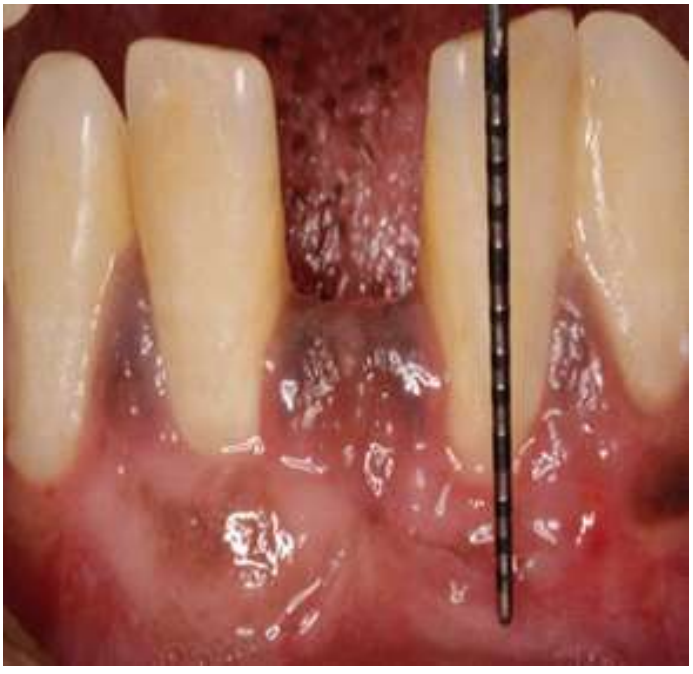

Figure 6: Post-operative evaluation after 6weeks

DISCUSSION:

Microsurgery plays a vital role in various field of study over the past few decades. The progress in operating microscopes, the refinement of surgical instruments, and the production of higher-quality suture materials have significantly contributed to the establishment of microsurgical techniques across different fields. Kim et al.,[11] in 2001 proposed the microsurgical triad, consisting of magnification, illumination, and instruments, highlighting their importance for achieving greater precision in surgical procedures.

A free gingival graft is a surgical procedure commonly performed in periodontal therapy to address issues related to gingival recession, in case of inadequate attached gingiva. This technique involves the transplantation of gingival tissue from the donor site to the recipient site[12].

During the procedure, the donor tissue is carefully harvested, typically from the palate, to ensure adequate thickness and blood supply. The recipient site, usually the area with recession, is prepared by making an incision and creating a space for the graft. The harvested tissue is then placed over the recipient site and secured in position using sutures[13]. Once in place, the transplanted tissue integrates with the surrounding gum tissue, promoting healing and re-establishing proper gum contours. The graft serves to increase the thickness of the gingival tissue, cover exposed tooth roots, and enhance the aesthetics of the smile. Additionally, it can help reduce tooth sensitivity and protect against further gingival recession.

After the procedure, patients are typically instructed to follow a specific post-operative care regimen, which may include avoiding certain foods, maintaining proper oral hygiene, and attending follow-up appointments to monitor healing progress. While some discomfort and swelling are common after surgery, most patients experience significant improvement in gum health and appearance following a free gingival graft procedure.

In a study conducted by Allen et al.,[14] advocates the use of gingival unit graft that consists of the marginal and papillary portions of the gingiva opposed to the conventional sub marginal approach of palatal graft harvest for FGG procedure. The rationale behind this argument lies in the higher vascularity of the marginal and papillary gingiva, which contains numerous interconnected loops, hairpin networks, and anastomoses, forming a dense vascular plexus.

By including this vascularized portion in the graft, superior tissue integration with the recipient bed is achieved, resulting in more aesthetically pleasing coverage and a favourable blend with surrounding tissues. In our case, the obtained tissue blend and colour match were superior to those achieved with conventional FGG techniques. Furthermore, no postoperative recession was observed at the donor site. However, complete root coverage was not achieved. This can be attributed to the significant preoperative recession depth (6 mm), making it unrealistic to expect complete coverage

In a study conducted by Patel et al[15]., conducted a study using free gingival graft concluded that Free grafts are an alternative to pedicle grafts and are the treatment of choice in areas where the gingival biotype is thin or there is a lack of keratinised tissue. This is in accordance with the present study conducted. However, according to Baekar et al.,[16] suggested that the gingival colour always has a difference in terms of hue.

An alternative to performing a free gingival graft in cases with a shallow vestibule is the tunnel technique. There's conflicting evidence in the literature regarding the role of tooth malposition in gingival recession. However, Cairo et al.,[17] argue that the influence of tooth malposition on recession development is uncertain. Cairo et al. even removed this criterion from their new classification system. Nonetheless, reducing root prominence is often considered beneficial in managing gingival recession.

CONCLUSION:

Free gingival grafts remain a cornerstone in modern dentistry, offering a highly reliable method for augmenting keratinized tissue around teeth, particularly in the anterior mandible. This technique is particularly valuable in cases characterized by extremely thin tissues, a shallow vestibule, and aberrant frenal attachments. It provides a predictable means of enhancing the health and stability of the gingiva, contributing to improved oral hygiene, reduced susceptibility to trauma, and enhanced aesthetics with the advent of microsurgery.

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ANGINA BULLOSA HEMORRHAGICA: AN ENIGMATIC BLOOD BLISTER

Sanskrithi Chethan[1]*, Priya NS[2], Nikita MV[1], Ashwini KB[3]

ABSTRACT

Background: Angina bullosa hemorrhagica (ABH) is the term used to describe benign sub epithelial oral mucosal blister filled with blood that is not attributable to a systemic disorder or haemostatic defect. It is a very rare condition. The oral cavity being a distinct and unique anatomical compartment can have pathologies ranging from reactive lesions to neoplasms. Red lesions can appear alarming for the clinicians. The haemorrhagic bullae spontaneously burst after a short time resulting in ragged, often painless, superficial erosions that heal spontaneously within 1 week without scarring. Trauma appears to be the most common identifiable precipitating factor, but the essential tissue defect is yet unidentified.

Case report: We report a rare case of angina bullosa hemorrhagica in a middle aged patient on the lateral border of the tongue, with a focus on its clinical course and diagnosis.

Conclusion: The purpose of this article is to report a rare case of angina bullosa hemorrhagica.

Keywords: Angina bullosa hemorrhagica, Blood blister, Trauma, Ulcer.

INTRODUCTION

Angina bullosa hemorrhagica (ABH) is an enigmatic rare disorder characterized by recurrent occurrences of blood-filled vesicles and bullae in the oral cavity, which is not caused by blood dyscrasia, immunobullous disorders, systemic diseases, or other causes. The exact incidence and prevalence of ABH is not known, thus it is being considered as multifactorial disease with local physical trauma on the oral mucosa as a trigger on susceptible individuals[1]. However, Grinspan et al. observed over 10,000 patients between 1990 and 1996 in their dental hospital and found 54 patients presenting with ABH. Between 1985 and 2016, a total of 225 cases were reported[2]. ABH is an example of oral mucosal traumatic lesion caused by various mechanical stimuli, especially by ingestion of hard and crispy food. The awareness of ABH in the field of dermatology and dentistry is very much necessary to avoid misdiagnosis, since this condition spontaneously rupture and heal without any treatment[3]. Blood investigation was not done in this case as the lesion fell off within 24 hours. This case report creates awareness regarding occurrence of the lesion especially on the tongue. Recurrence may occur in 30% of patients[4].

CASE REPORT

A 45 year old male patient presented with small red boil on the left lateral border of the tongue since a day (Figure 1).

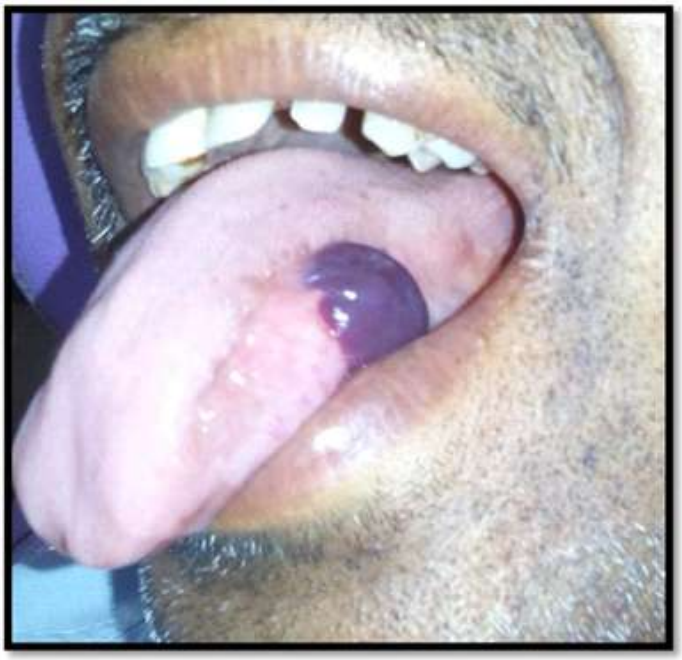

Figure 1 :Blister on lateral border of Tongue

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History of trauma was elicited by the patient. Patient's medical history was non significant. Intra-oral examination revealed a well defined solitary blister about 1.3 cm that appeared dark purple in colour filled with blood surrounded by ecchymotic halo on the lateral border of the tongue. The lesion was not associated with any discomfort or pain. Provisional diagnosis of hematoma was considered. Patient was recalled for biopsy along with routine blood investigation. In the next visit that was after 24hrs the blister had fallen off following formation of ragged surface (Figure 2).

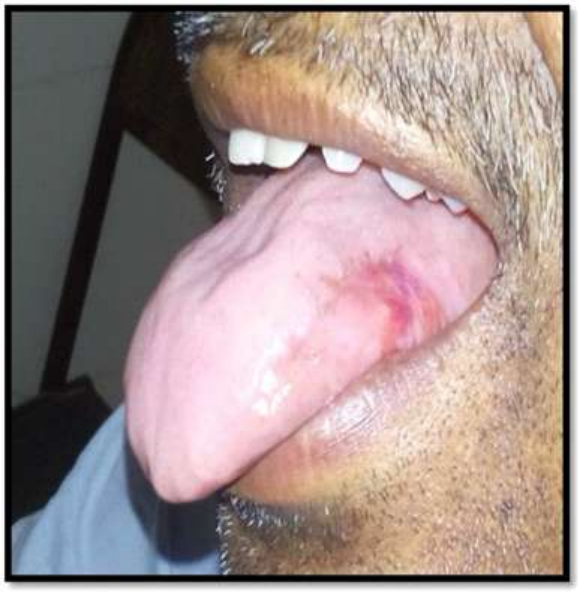

Figure 2 : Intra oral appearance after 24 hours

This superficial erosion healed after a week with no scars.

Considering history of trauma and lesion falling off in a day, diagnosis of ABH was rendered and no further investigation was required

DISCUSSION

Haryng in 1890 referred to this condition as "Traumatic Oral Hemophlyctenosis". Later 1967 Badha coined the term differently calling it "Angina Bullosa Hemorrhagica"[5]

ABH is the term used to describe benign sub epithelial oral mucosal blisters filled with blood that are not attributable to a systemic disorder or haemostatic defect[6].

The most relevant etiological agent in most cases (> 80%) is history of trauma associated with hard, hot, or spicy food intake[7]. A possible association of ABH with diabetes mellitus, hyperglycemia and hypertension has also been suggested [7-9]. Long-term use of inhaled corti costeroids can also be one of the etiological agents [7-11].

The etiopathogenesis of this lesion is yet unknown thus being considered nowadays as a multifactorial disease with local trauma on the oral mucosa as the trigger on susceptible individuals [12]. It has been suggested that a loss of cohesion between the epithelium and the chorion can cause the rupture of the sub epithelial capillaries after trauma and condition the emergence of a blood containing blister[13]. Another inhaled drug linked to the onset of ABH is Ipratropium Bromide, an antimuscarinic bronchodilator [14].

ABH mainly affects the soft palate, but lesions can also develop on other oral sites including the buccal mucosa, oropharynx, lip and the lateral surface of the tongue; the masticatory mucosa of the hard palate and gingiva does not seem to be affected. ABH patients have been mainly the middle-aged and elderly; lesions have not been documented in children less than 10 years of age. There is no apparent gender predilection[15].

The lesion of ABH appears a dark red-violet blister with haematic content. It can be a solitary/ multiple lesion measuring about 0.3 to 4cm in its greatest dimension. Lesions may appear abruptly within seconds. It may present with mild discomfort or burning or even a stabbing pain sensation. The blister stays in the oral cavity for few minutes to hours or even days. When the blister ruptures spontaneously or while eating, its hematic content is emptied forming an ulcerated area[5].

Diagnostic criteria for the diagnosis of ABH proposed by Ordioni et al[16].

- Clinically visible hemorrhagic bulla of ABH with a history of bleeding present in the oral cavity
- Location is specific to oral or oropharyngeal region
- Localised in palatal region
- Food being one of the triggering factor
- Absence of scar within few days
- Lesion is painless with burning and tingling sensation
- Present recurrence of the lesion
- Platelet count , complete blood count and coagulation profile within normal range
- Negative direct immunofluoresecence

The differential diagnosis of ABH should be made with all vesiculobullous diseases of the oral cavity, including haematological disorders, mucocutaneous immunological pathology and cystic pathology (Table 1).

Table1: Differential diagnosis of ABH[5]

Haematological disorders	Mucocutaneous immunological pathology	Oral cystic pathology
Thrombocytopenia	Pemphigus vulgaris	Superficial mucocele with blood
Leukemia	Mucous membrane pemphigoid	
Vasculitis	Linear IgA disease	
Hematoma	Epidermolysis bullosa acquisita	
	Bullosa amyloidosis	

Haematological lesions are usually multiple and wide spread in other locations of the body and generally producing systemic symptoms. Mucocutaneous immunological diseases are the most important differential diagnosis of ABH and should include Pemphigus vulgaris that appears as intraepithelial blisters and vesicles on the gingiva in the areas of friction, Mucous membrane pemphigoid and Linear IgA disease that appears as serous and serohematic subepithelial blisters and vesicles on the gingiva , Epidermolysis bullosa acquisita that appears as serous serohematic or hematic subepithelial blister on gingiva and Bullosa amyloidosis that appears as hematic subepithelial blisters on gingiva. The differential diagnosis includes superficial mucocele with blood. This lesion is characterized by presence of subepithelial blister that initially contains mucus but after traumatic events, may contain blood and may be mistaken with ABH[5].

If the lesion doesn't fall of on its own, a complete blood count, coagulation test and platelet test can be done.

The cases where the ABH lesions have been biopsied before its rupture show a sub epithelial blister with haematic content and an atrophic squamous epithelium surrounding the lesion[17]. The biopsy of the ulcer formed after the rupture of the blister shows an unspecific ulcer with chronic inflammatory infiltrate, mainly lymphocytic[12].

CONCLUSION

ABH is a poorly understood uncommon disorder of the oral cavity, and its etiology remains uncertain. Although ABH has a good prognosis and a favourable evolution in a few days, it can share some clinical and histological characteristics with more serious diseases, making diagnosis difficult. Therefore, a careful clinical examination is essential to ensure a correct diagnosis

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KNOWLEDGE, ATTITUDE AND PERCEPTION OF ORAL DISEASES AMONG MBBS INTERNS – A CROSS-SECTIONAL STUDY

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ABSTRACT

Oral diseases and conditions are very common among general population especially in Indian population as reported by WHO in 2022. The aim of our study is to evaluate the knowledge and awareness about oral conditions presenting to MBBS Interns , and to document if second opinion for the presenting dental condition is sought.

Materials and Methods

A Questionnaire Study was carried out among randomly selected 79 MBBS interns in Kollam using google forms online survey tool.

Results

Completely filled questionnaire was obtained from the MBBS interns.

Discussion

The relationship between oral and general health and the impact of oral health on general health and welfare has been well established in recent times by various studies and the prevalence of dental disease in India makes it a necessity such that not only dental practitioners but also medical practitioners and by extension MBBS Interns to be able to diagnose and manage certain dental diseases.

Conclusion

From this study it was concluded that most of the MBBS interns are well versed with the importance of Oral Health for the general health and welfare of patients,

Keywords: Knowledge, Perception, Attitude, Oral diseases, Interns

INTRODUCTION

Oral diseases and conditions are very common among general population especially in India as reported by WHO in 2022. Most of the oral conditions have an insidious onset, and are chronic and asymptomatic in nature until they have progressed to an advanced stage. [1] Also there are several systemic diseases with oral manifestations many of which manifest earlier than their systemic counterparts this makes the routine oral examination an extremely important and a viable area for the early detection and the treatment of the variety of oral and systemic diseases. [2]

General practitioners are often the first point of contact for advise and management in cases of dental related pain; reasons for presentation to the General practitioners, rather than the dentist include non classic presentation of dentofacial pain, lack of coordinated after hours dental care, poor patient education, patients' prescription of their GP as the primary coordinator of integrated total care and financial considerations. [3] "the Mouth is the mirror to the body" and "A window of systemic diseases" hence oral Examination is extremely important. [4]

However, for various reasons, General practitioners may not be well equipped for managing dentofacial pain these include, minimal dental education in medical schools, inconsistent exposure to dental problems, absence of management guidelines, poor localisation of dentofacial pain and poor communication and collaboration with the GPs and dentists. [5]

Dentists though unlike medical practitioners are well equipped and trained to deal with most of the common presentations of dental pain. Furthermore, less common and atypical dentofacial pain presentations are adequately dealt by dental specialists in the area of oral medicine and oral maxillofacial surgery. [6]

The aim of our study is to evaluate the knowledge and awareness about oral conditions presenting to MBBS Interns and to document if second opinion for the presenting dental condition is sought.

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MATERIALS AND METHODS:

Questionnaire Study was carried out among randomly selected 79 MBBS interns in a Medical College in Kollam ,using google forms online survey tool (Table 1).The questionnaire was designed to be simple, quick and easy to complete.The questions were based on oral manifestations of many diseases ,side effects of drugs and whether appropriate second opinion was sought.The data obtained is analysed by Jamovi.

Table 1 : QUESTIONNAIRE

QUESTIONNAIRE					
1.How often do you manage patients with dental problems or conditions?	a.Frequently (>5 in a week)	b.Occasionally (2-5 in a week)	c.Rarely (less than 2 in a week)	d..Never	
2.How do you treat a patient with dental abscess?	a.Prescribe antibiotics and painkillers	b.Refer to the dentist	c.Ignore		
3.When do you refer to a dentist?	a.Swelling	b.Odontogenic infection	c.Headache and facial pain	d. Red and white lesions	e. All of the above
4.You think pregnant women need dental check up?	a.Yes	b.No			
5.Paediatric patients must visit the dentist regularly?	a. Agree	b.Disagree			
6.Are you aware that infections in the dangerous area of face if left untreated may lead to fatal complications?	A.Yes	b.No			
7.Tobacco use and Consumption causes oral conditions and oral premalignant Conditions and oral cancer?	A.Yes	b.No			
8.Are you aware that diabetic patients are more prone to develop oral changes as complications?	a.Yes	b.No			
9.Are you aware of oral changes in bleeding disorders?	a.Yes	b.No			
10.Are you aware that Systemic diseases are reflected in oral cavity?	a.Yes	b.No			
11.Are you aware that certain Anti-hypertensives can cause gingival enlargements and oral ulcers?	a.Yes	b.No			
12.Are you aware that certain dental infections can cause Sub Acute Bacterial Endocarditis (SABE)?	a.Yes	b.No			
13.Do you think HIV,TB,Syphillis have oral manifestations?	a.Yes	b.No			
14.Are you aware that prescription of certain medications can cause oral Ulcers and hypersensitivity reactions?	a.Yes	b.No			
15.Are you aware that many diseases show oral symptoms even before the disease shows clinically?	a.Yes	b.No			

RESULTS:

Completely filled questionnaire was obtained from the MBBS interns. According to the sampled interns 84% they come across 2-5 patients with oral diseases or conditions in a week (Fig 1). On coming across patients with dental abscess 85% of them chose to refer to dentist while rest 15% chose to prescribe antibiotics and painkillers (Fig 2). On questions asked about referral to dentists about 91% of interns chose to refer to dentist on swellings, headaches, facial pain. 100% of the participants were aware that pregnant women and children require regular dental check-ups. all participants were aware of oral manifestations and effects of systemic diseases, tobacco and alcoholism, bleeding disorders, diabetes, TB, Syphilis. 100% of participants were aware of oral conditions caused due to prescription of certain drugs. 98% of participants were aware of the dangerous consequences of untreated infections in the dangerous area of face.

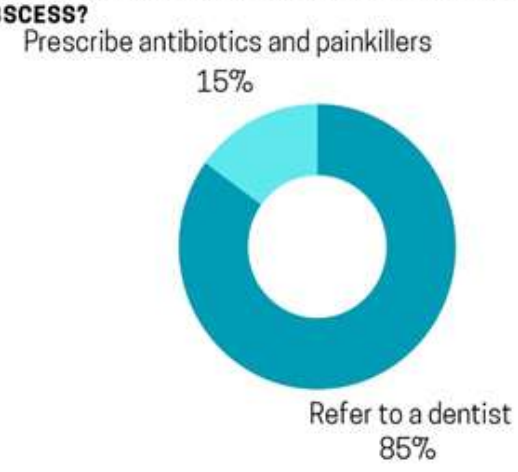
DISCUSSION:

Poor oral conditions may adversely affect general health and certain medical conditions may have a negative impact on oral health. [7] The relationship between oral and general health and the impact of oral health on general health and welfare has been well established in recent times by various studies and the prevalence of dental disease in India makes it a necessity such that not only dental practitioners but also medical practitioners and by extension MBBS Interns might need to diagnose and manage certain dental conditions.. This Cross-sectional study was conducted to assess the dental knowledge, attitude and awareness of MBBS Interns in Kollam.

While our study revealed that 84% of the 79 sampled interns responded with seeing two to five patients with oral symptoms/conditions weekly. A questionnaire study conducted by M.C. Bater et al 2005, there were 114 (73%) responses with 52 (46%) General practitioners consulting between two and five patients with oral symptoms/conditions weekly. [8]This primarily suggests an increase in prevalence of dental diseases which might be attributed to cultural , genetic or dietary differences.

A study by Anderson et al, has demonstrated that medical practitioners are more likely to prescribe antibiotics for acute dental abscess than dentists, according to this study on interns, 85% felt that referral of the patient to a dentist is the more appropriate way to treat a dental

FIG 2.HOW DO YOU TREAT A PATIENT WITH DENTAL ABSCESS?



abscess than to prescribe antibiotics and painkillers, which was about 15%.On a study by P. Deeksheetha et al , 86% felt that referral of the patient to a dentist is the more appropriate way to treat a dental abscess than to prescribe antibiotics and painkillers, which was about 13%. Only 1% of the participants answered that the abscess can be ignored and that it will subside.

In our study 100% the sampled interns were of the opinion that paediatric patients require regular dental check-ups (Fig 3).

FIG 1.HOW OFTEN DO YOU MANAGE PATIENTS WITH DENTAL PROBLEMS OR CONDITIONS?

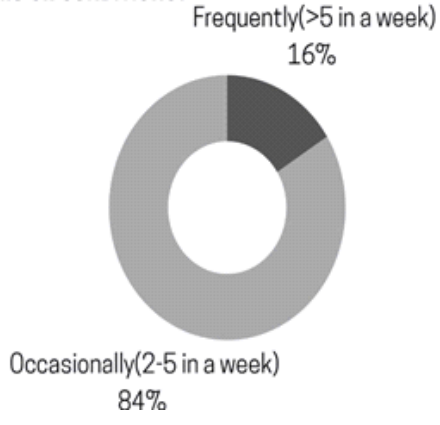
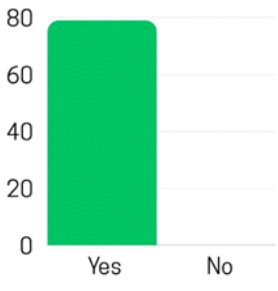


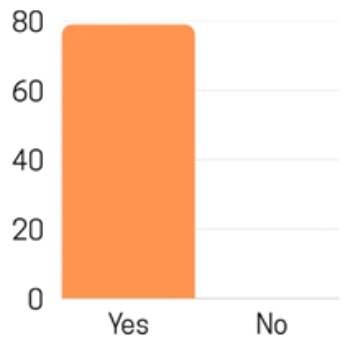
FIG 3.PAEDIATRIC PATIENTS MUST VISIT THE DENTIST REGULARLY?



In the present study with regard to untreated dental and perioral infections in the dangerous area of the face causing cavernous sinus thrombosis, a life threatening situation due to untreated dental infection, 98% of the sampled Interns had opted for 'yes',. These findings were similar to with a higher percentage than the study conducted by Jagadish Chandra et al and Srinidhi et al where 85 % and 85.7% of subjects respectively, were aware that some dental diseases are life threatening.This result was also better than the study by Nagrik et al. which reported 84.4% responding correctly. This better informed response might be attributed to the increased awareness by virtue of having easier access to information through smartphones and internet.

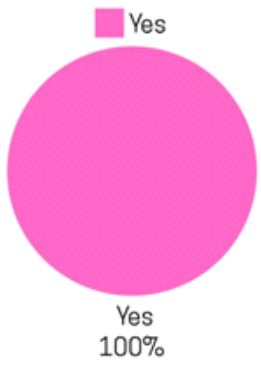
In our study 100% of the participants were aware that certain antihypertensives can cause gingival enlargements (Fig 4).

FIG 4. ARE YOU AWARE THAT CERTAIN ANTIHYPERTENSIVES CAN CAUSE GINGIVAL ENLARGEMENTS AND ORAL ULCERS?



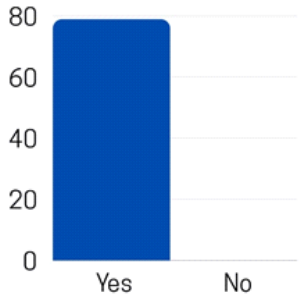
The Knowledge about dental disease exacerbating systemic health, 100% of the participants in our study believed dental diseases could exacerbate Infective endocarditis (Fig 5). This indicates that they were better informed than those who participated in the study by Nagrik et al which showed that only 64.5% knew of this fact.

FIG 5.ARE YOU AWARE THAT CERTAIN DENTAL INFECTIONS CAN CAUSE SUB ACUTE BACTERIAL ENDOCARDITIS (SABE)



Also 100% of the participants in our study were aware that diseases show oral symptoms even before the disease shows clinically (Fig 6).

FIG 6.ARE YOU AWARE THAT MANY DISEASES SHOW ORAL SYMPTOMS EVEN BEFORE THE DISEASE SHOWS CLINICALLY?



All the interns considered in the present study agreed that pregnant women need dental check-ups, which was similar to the results obtained by Dr. Rajesh et al. of which majority of doctors were of similar opinion doctors should be encouraged to refer pregnant patients for oral health examination.[9]

Most of the general physicians are an important group of providers who have an opportunity to encourage oral health and to make a significant difference because of their access to families as a family physician. It is also important for medical practitioners to keep their knowledge updated with time and get actively involved in oral health, as it is a known fact that our mouth is a mirror of systemic diseases and conditions.[2]

CONCLUSION:

From this study it was concluded that most of the MBBS interns are well versed with the importance of Oral health for the general health and welfare of patients, The importance of regular dental check-ups especially for pregnant women and children, the effects of tobacco use and alcoholism in oral cavity, the dangers of untreated dental diseases and conditions and the effects of certain drugs and systemic diseases in causing oral conditions.

Many patients with oral symptoms present initially to their general practitioner (GP) with a variety of problems, ranging from simple benign disease to premalignant or malignant conditions. Early recognition and diagnosis of this disease spectrum is of paramount importance in the successful treatment, and directly affects prognosis of the disease condition.[10]

Oral health education can be included in the medical curriculum to emphasize a positive attitude towards oral health.[11]

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AESTHETIC MANAGEMENT OF CONGENITAL DENTAL DEFORMITIES – TWO CASE REPORTS

Greeshma S Praveen[1], Shyam Mohan A[2], Midhun M[1], Rohit Renji[3], Ambili R[4], Sudeep S[5]

ABSTRACT

Providing functional and esthetic restoration for patients with dentinogenesis imperfecta and amelogenesis imperfecta is a major challenge for prosthodontists. Diagnosing and managing them as early as possible is crucial for a favorable outcome. Preserving tissues and rehabilitation with a multidisciplinary approach is important for function and aesthetics. Prosthodontic rehabilitation of this kind greatly improves function, and esthetics and proves to be a great psychological boost to the patient's well-being. This case report highlights the importance of proper diagnosis and management of Amelogenesis imperfecta and Dentinogenesis imperfecta while keeping in mind the patient's primary concern.

Keywords: Amelogenesis imperfecta, Dentinogenesis imperfecta, aesthetic crown lengthening

INTRODUCTION

Congenital defects are disorders that occur while a baby is developing in the mother's body, often during the first three months of pregnancy due to inherited or spontaneous genetic mutations, environmental factors, drug or alcohol use, infections, nutritional deficiencies, or medical conditions. Amelogenesis imperfecta (AI) is a hereditary defect of enamel affecting both the primary and permanent dentition. AI includes only those cases where enamel defects occur in the absence of other syndromes or metabolic disorders. [1] AI patients have trouble maintaining oral hygiene, decreased masticatory function, and lower self-esteem, affecting their overall quality of life.[2]

Dentinogenesis imperfecta (DI) is inherited as an autosomal dominant trait and it is one of the most common dominantly inherited disorders in humans. The scalloping at the dentin-enamel junction which is thought to help the mechanical interlocking of the two hard tissues together is defective in these conditions which lead to enamel fracture easily from the defective dentin. The exposed dentin may then undergo severe and rapid attrition.[3] Early diagnosis and proper treatment are mandatory in these conditions. Delay in the treatment can cause partial or complete loss of clinical crowns with healthy roots.[4]

Depending on how extensive the underlying condition is, the remaining tooth structure can be severely compromised, which can lead to compromised bonded restorations, such as veneers or all-ceramic restorations. Case reports have suggested that bonded all-ceramic restorations, especially CAD/CAM-manufactured all-ceramic restorations, can be used successfully in patients with DI according to the availability of enamel.[5]

Lithium disilicate full crowns cemented with luting composite are reported to have higher failure loads compared with conventional cementation with glass-ionomer cement. Lithium disilicate crown cemented with luting composite most often failed by fracture, and crown cemented with glass-ionomer cement most often failed by decementation.[6.]

In this article, we will be discussing two cases where the aesthetic and bonding challenges of restorations in patients with AI and DI are managed.

Case I

A 22-year-old female patient presenting with discolored teeth was reported to the Department of Prosthodontics. The patient had no relevant family history or dental history of discolored primary teeth. On clinical examination, translucent and discolored teeth (yellow brown) were seen. Generalized wear was seen and a history of breakage was present. It was diagnosed to be Type II Dentinogenesis imperfecta.

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The patient had a midline shift and a high smile line. (fig 1A). Intraoral photographs at occlusion were taken (fig 1B, 1C, 1D) Since the patient was not willing to do orthodontic correction and her primary concern was discoloration, a practical approach was decided. Due to insufficient dentin, full crowns were opted for instead of laminate veneers.

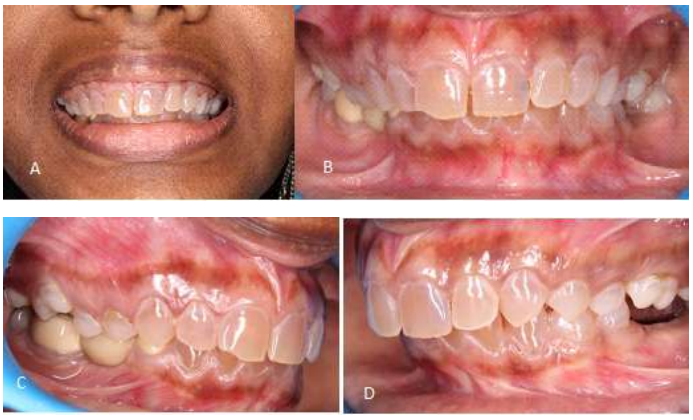
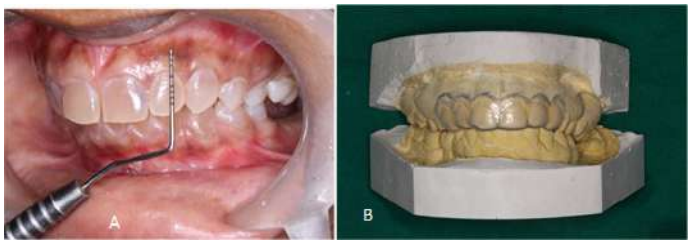


Fig 1 A: High smile line. B, C, D: At occlusion

A diagnostic impression was made and a wax-up was done followed by a mock trial to give an idea to the patient regarding the outcome. Consent was obtained from the patient. To improve the esthetics crown lengthening was planned and the patient was referred to the Department of Periodontics for the management of the same. The oral hygiene status and periodontal health was found to be satisfactory with no deep pockets. Professional Mechanical Plaque Removal (PMPR) was done followed by Laser-assisted Gingivectomy in relation to the upper anterior teeth using a Diode laser [AMD Picasso 810nm at a power of 1.5J/s] in continuous mode with an activated tip. Review after 1 week was done and healing was satisfactory. The apically positioned flap was done in relation to the lower anteriors due to inadequate attached gingiva in the region. Full thickness flap was reflected in relation to labial aspect of lower anteriors and flap was apically positioned to obtain adequate crown length and sutured using 3-0 non absorbable silk sutures. A periodontal pack was placed over the wound area and post-operative instructions were given. Healing was uneventful without any postsurgical complications (Fig 2).



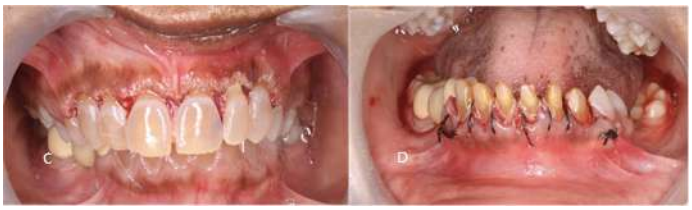


Fig 2. A : Gingival examination B : Guide for gingivectomy,
C : Gingivectomy of upper anteriors;
D : Apically repositioned flap of lower anteriors

Full ceramic Crown preparation and temporisation were done for upper and lower anteriors. Digital designing of the crown was done (fig 3). Lithium disilicate crowns were cemented using glass ionomer cement. (fig 4)

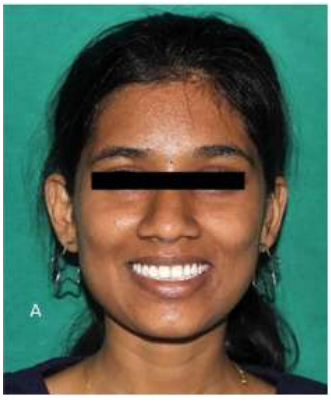
Fig 3, A: tooth preparation wrt upper and lower anteriors, B: Digital designing of crown,
C : Lithium Disilicate full crowns,
D : Crowns luted intraorally

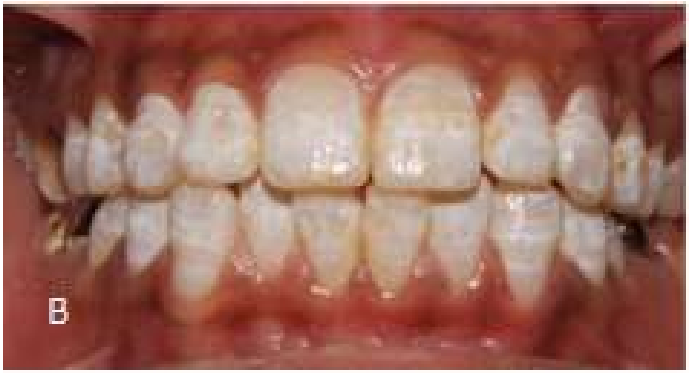
Fig 4 A, B: Post-treatment result

Case 2

A 21-year-old female patient presented with discolored teeth to the Department of Prosthodontics (fig 5). The patient had no relevant family history and no dental history of discolored primary teeth. On clinical examination, teeth showed mottled appearance, presence of pitted and soft enamel was noticed, it was diagnosed to be hypomaturation type Amelogenesis imperfecta (qualitative defect). Patient had an average smile line (Fig 5C).

Since aesthetics were her primary concern and she was willing only for upper anterior rehabilitation veneers were opted as treatment plan.





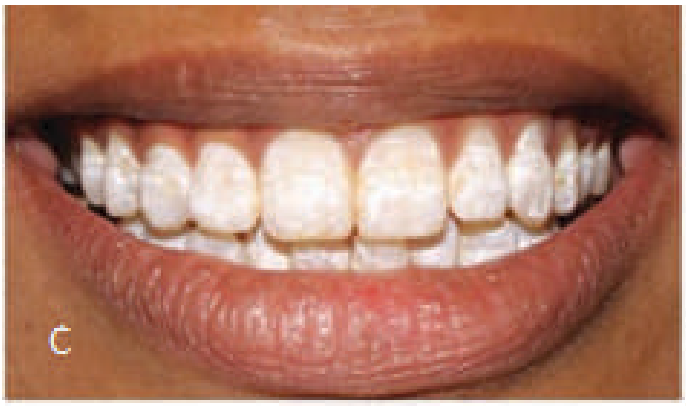


Fig 5:A, Pre operative photograph.

B, Mottled enamel appearance . C,Average smile line

Diagnostic impression was made . Consent was obtained from the patient.

Veneer preparation was done in upper anterior teeth (fig 6A, 6B). Digital designing of veneers was done (Fig6C). Veneer was seated on the prepared cast to check the fit.(fig 6D).

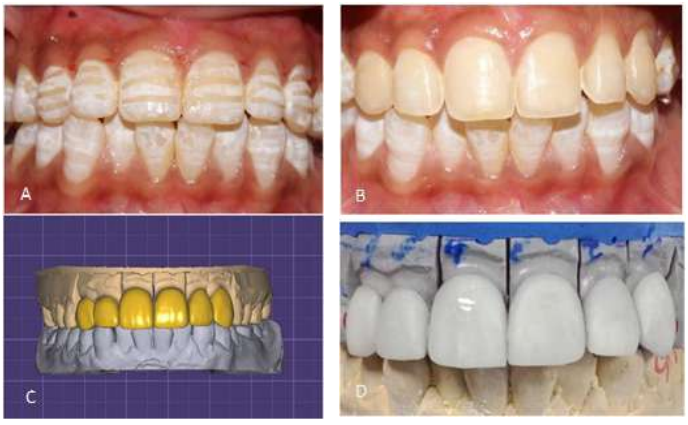


Fig 6;A :Depth orientation grooves placed wrt upper anteriors ,B: veneer teeth preparation done, C:digital smile designing, D: lithium disilicate veneers on cast

Veneers were pretreated with hydrofluoric acid (Ultradent Porcelain Etch) for 90 seconds and silane coupling agent (Angelus Silano Silane Coupling Agent) applied in the internal surface of the veneer. Prepared teeth were conditioned with 37 % phosphoric acid for 30 seconds and washed and dried.This was followed by the application of bonding agent (Ivoclar Vivodent Te-Economic Bond) which was then air dried and thinned. Veneer cement (self adhesive resin cement)(3M RelyX veneer cement) was applied on the internal surface of the veneer and it was seated onto the teeth. Excess was removed and light curing was done. (Fig 7)

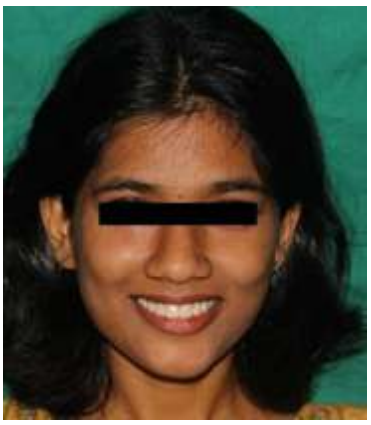


Fig 7 Post treatment result.

DISCUSSION

Fundamental defect in dentinogenesis imperfecta is mesodermal in which primary structural abnormality is in dentin. Kerebel et al[7]. and Wright et al.[8] showed gross abnormality of dentinaltubules and dentinal calcification, whereas enamel, cementum, and periodontal ligament are normal. The affected dentin has less calcium (Ca), phosphorous (P), magnesium, a higher Ca:P ratio, and higher water content. The chief characteristic of dentinogenesis imperfecta is higher wear rates due to the absence of intrafibrillar mineralization. In dentinogenesis imperfecta, the deterioration of the enamel–dentin junction results in the ready loss of enamel. The main goals of DI treatment are to protect the dentin from caries and to prevent tooth attrition, abrasion, and erosion. The dental treatment of patients with dentinogenesis imperfecta should protect the structure, esthetics, and tooth function. Also, prosthetic crown restoration could be considered in esthetic treatment planning in young patients.[9] Composite veneers are indicated in patients suffering from DI, especially in the frontal region in teeth which are without caries and with low abrasion. This treatment allowed optimal esthetic and function, as well as preserved the structure of the remaining natural teeth.[10]

In the first case report the remaining tooth structure was compromised with inadquate enamel and dentin leading to compromised bonded restorations, such as veneers or all-ceramic restorations. Hence the decision of lithium disilicate full crowns cemented with GIC was taken. The aim was to restore the patient's main concern , esthetics. For amelogenesis imperfecta in the permanent dentition, the final treatment objectives are to diminish tooth sensitivity and to restore vertical dimension of occlusion, function, as well as esthetics. The final treatment often starts as soon as clinical height of the crown and the gingival tissue have been stabilized and the pulp tissues have receded. Full mouth rehabilitation combined with a multidisciplinary approach may be advantageous . Although bonding onto the hypoplastic enamel is feasible, sufficient enamel must be available for bonding.[11] Indirect ceramics provide better clinical performance and durability on account of ceramic superior mechanical properties and resistance to aging. However, indirect ceramics have limited application for restoration of young AI patients because ceramic crowns involve a high risk of pulp exposure and ceramic veneers are likely to be negatively affected by the enamel quantitative and qualitative alterations . When the indirect ceramic restorations are not indicated, prefabricated composite veneers provide an alternative technique for an esthetic and functional restoration of young amelogenesis imperfecta patients.[12] In the second case report there was adequate enamel present after tooth preparation . So lithium disilicate veneers bonded with veneer cement was chosen with predictable aesthetics.

Conclusion

Providing functional and esthetic restoration for patients with dentinogenesis imperfecta and Amelogenesis imperfecta is a major challenge for prosthodontists. It is crucial to diagnose and manage them as early as possible in order to obtain a favourable outcome. Preservation of tissues and rehabilitation with multidisciplinary approach are important for function and esthetics. Prosthodontic rehabilitation of this kind greatly improves function, esthetics and proves to be great psychological boost to the patient's well-being.

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