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Editorial

The Editor of the " UPDATES IN DENTISTRY" had the audacity to publish my views from dentistry. As I write this column, we are living under the shadow of the corona-virus pandemic. The morbidity and mortality statistics are truly frightening at this point and are supposed to get much worse. Amidst this pandemic, this journal continues its normal publication schedule, thanks to the production team they are doing right now in the face of this global crisis.

With the concern of infection control in health care settings, personal protective equipments (PPE) have been given to many individuals. American Dental Association advised all the dental practices to cease non-emergent in-person care to reduce the infection rate and started to rebuild stockpiles of PPE for health care providers.

Many people today enjoy excellent oral health and are keeping their natural teeth throughout their lives. But for some, caries are still the most prevalent chronic disease of childhood. Too many people mistakenly believe that they need to see a dentist only if they are in pain or something is wrong.

Dentistry promotes continuity of care that is comprehensive, convenient, cost effective and efficient. Their responsibilities include diagnosing of oral diseases and promoting oral health and its prevention. Even the routine procedures such as tooth extractions, preparing and placing fillings, carry potential risks of complications such as infection, temporary or even permanent nerve damage, prolonged bleeding, pain etc. Dentists can spot early warning signs in t he mouth that may indicate disease elsewhere in the body. Regular dental visits and care will help maintain and improve optimal health throughout their lifetimes.

With people around the world wondering what the future will hold after this pandemic, I remain confident that our profession will not only survive but thrive. My confidence is even deeper, with a passion for symmetry, perfection and beauty to unlock each patient's epitome of a perfect smile.

Going forward with the most rewarding thing, the patient's happiness and satisfaction and the stability of the results.

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Case Report

THERMAL BURN OF PALATE- A CASE REPORT

Dr. Lakshay Vishnoi, Dr. Upender Malik, Dr. M.K. Sunil

ABSTRACT

Oral cavity is susceptible to many injuries including burns, traumas, pathologies etc. Due to the high vascularity and thinned epithelium of oral mucosa, healing usually occurs in a short time and many a times treatment is not even required. Some lesions or trauma requires treatment depending on the depth of damage caused. This article describes a case of a 26 year old male patient who injured his palate.

Keywords: Thermal burn, chemical burn, cryogenic burn, electrical burn.

INTRODUCTION

Burns are the common type of injury which is encountered by many dental professionals in a day today practice. These are the type of tissue injury which has potential to cause localized or diffuse areas of tissue damage depending upon the extent and severity of the vandalization.[1]

Oral soft tissue injuries can be accidental (unintentional) or self-inflicted. There are various types of oral mucosal burns which includes thermal, chemical, cryogenic, mechanical, electrical, radiation induced etc.[2] The most frequent cause of thermal burns in the mouth is unintentional consumption of hot foods or drinks. Ancillary severity and extent of the injury, the clinical manifestation of thermal burn can range from erythematous to ulcerative, localised or dispersed area of tissue destruction.[3]

Case report

A 26 year old male patient reported to the department of oral medicine and radiology with the chief complaint of pain and discomfort while chewing food since 3-4 days. Patient gave history of smoking cigarette since 8 years and tobacco chewing occasionally. He only drinks alcohol occasionally. The medical history was free. Dental history was free apart from prophylaxis history. Patient was 68 Kg and 172cm in height. Patient had consumed hot pizza 3 days back after which he experienced dysphagia. The burn incident, as described by patient occurred the moment he bites the centre portion of the pizza. Cheese stuck to palate before he could spit it out.

Intraorally, Inspection showed erythematous patch over the hard palate along with few ulcerative areas (Fig-1).On palpation, inspectory findings were confirmed, patch was highly tender in nature and few vesicles that have erupted due to the extremely high temperature of melted cheese.

The treatment advised was 0.12% chlorhexidine mouth wash for one week along-with the topical application of corticosteroid (0.1% triamcinolone ointment) thrice a day half hour before meal to be applied as a thin film over the patch without rubbing or massaging it.

It was advised to avoid smoking and consuming hot food items including acidic foods and drinks like tomatoes, orange juice, coffee and spicy foods. till the issue resolves. On the other hand, patient was asked to drink non-carbonated cold fluids and to carefully clean and brush the teeth without injury or touching the erosive areas of the damaged mucosa.

Fig. 1- Burn and erythema over the palatal mucosa

DISCUSSION

Burns in the oral cavity is not a new challenge which patients and dental professionals rendezvous. Various burns encompasses thermal burn, Chemical burn, cryogenic, electric ones.[4] Hot food or drinks or other sources of high heat are the usual causes of thermal burns and most commonly involved area is considered the palatal arc and the anterior one third of the tongue. It is generally accepted that food centrally containing liquid or soft material,

such as cheese, may have higher temperature internally than externally.[5]

Pizzas and cheese pies both contain same material i.e cheese. Hypothetically, cheese is the substance with the high level of temperature retention. It is beleived that when heated in the microwave, cheese pies are more harmful than pizzas since the implicated substance is centrally situated.[5]

In pizzas, the melted cheese may be easily seen indicating that the temperature is still high. In cheese pies, the effect of peripheral cooling does not indicate the same for the central portion. This is dangerous because tactile sensation is not adequate to assess the entire temperature. Biting hot food allows the entire melted cheese to flow on the mucosa causing areas of erosion, or in more extreme cases, ulcerations.[6] The previous observation depends primarily on the temperature at the time of contact, and secondly the duration of contact.

On the other side, ingestion or contact of substances of extremely low temperatures can also result in cryogenic burns. Another important cause of intra oral burns is due to chemical insults to the oral mucosa[7]. A chemical burn of the oral mucosa occurs as a result of a noxious agent placed in direct contact with the mucosa either by the patient or a dentist.[8] Oral electrical burns are less common in today's day and age. If found, they're seen in young children who come in contact with electrical wires etc[9].

Treatment of palatal burns depends on the depth and extent of the lesion. Lesions which are medium in size, are usually managed by using preventive measurements, such as non-steroidal anti-inflammatory drugs (NSAID's), antibiotics – in cases of poor oral hygiene or in cases where systemic status indicates – and finally antiseptic mouth washes.[10] In our case, the erythematous patch was treated by using topical application of 0.1% triamcinolone ointment (Kenacort).

CONCLUSION

Thermal burns can impair the normal activities and fuctions in the oral cavity of the patient and can manifest in various clinical features. After arriving at a diagnosis, treatment can be provided by first removing the causative factor. For its comprehensive management, dentist should gain complete dossier, thorough examination and have the ability to distinguish it from other lesions.

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Case Report

MENTAL NERVE NEURALGIA SURGICAL TREATMENT: A CASE REPORT

Dr Harish Vaishnav, Dr Manisha Solanki, Dr Devdeepak , Dr Vinod Mehra

ABSTRACT

Trigeminal neuralgia also known as 'Fothergill's disease' or 'tic douloureux' is a very peculiar disease.[1] The pain is paroxysmal and can be triggered by a mild cutaneous stimulus on the face or "trigger zone". The disease has a wide variety of etiology and clinical presentation. The differential diagnosis comprises of idiopathic facial pain, migraine, temporal arteritis and glossopharyngeal neuralgia which can also be considered. The management will include both medical and surgical approach. We present a case of Mental nerve neuralgia who was on long term medication for neuralgia but not relieved of pain,So treated successfully surgically i.e, Mental nerve Neurectomy.

Keywords: Trigeminal Neuralgia; Mental Nerve Neurectomy.

INTRODUCTION

Trigeminal neuralgia (TN) is also known as 'Fothergill's disaese' or 'tic douloureux'[1]. It is elicited by a sudden, sharp, severe, intermittent, lancinating, usually unilateral facial pain in the distribution of one or more divisions of the trigeminal nerve, lasting from a fraction of second to minutes and is triggered by trivial cutaneous or intraoral stimuli[2]. The mental nerve is primarily a sensory nerve and innervates after leaving the foramen, lower canines and premolars and therefore plays an important role in this area, such as administration of local anesthesia and surgical intervention. The mental nerve comes out from the mental foramen, which is located on the anterolateral aspect of the mandible, 13–15 mm superior to the inferior border of the mandibular body. The direction of the opening of the mental foramen is outward and upward in a posterior orientation. The average position of the mental foramen is found at the apices of the second premolar, and the average distance is 2.8 cm lateral to the mandibular skeletal midline.

CASE REPORT

A female patient 55 years of age reported to the Department of Oral and Maxillofacial Surgery, Surendera Dental College and Research Institute, Rajasthan University of health and science with a chief complaint of pain in the lower right side of the face for the past 3 years. Patient was apparently alright 3 years ago. She reported pain in the lower right side of the face. The classical TN was diagnosed according to Sweet's criteria (the pain is sharp, shooting, sudden, intermittent, paroxysmal, lancinating and current like which may be provoked by light touch to the face, yawning, talking, wind blowing on face and chewing food which was confined to mental distribution, unilateral and the clinical sensory examination is normal.

The pain was triggered by touching on lower lip area and corner of mouth, pain referred to the right side of the face in the temporal region. Patient had earlier visited the local dentist where he prescribed local analgesics and antibiotics several times but the symptoms did not subside. After a year she was referred to Oral Surgery Department where she was prescribed carbamazepine 200mg three times a day. The symptoms subsided after few months but were not completely cured. The patient again reported with pain in the same region. We increased the dose but patient not able to tolerate high dose.Further we planned for surgery.

The patient was assessed preoperatively including a detailed history, clinical general and neurological examination, and the response of pain to carbamazepine was detected. Diagnostic block with 2% lignocaine was used to confirm the involved mental nerve in the patient it gave complete relief from the symptoms until the action of anesthesia wore off. Informed written consent was obtained from the patient included in this study for mental nerve neurectomy of the involved branch of the trigeminal nerve.

Regarding the surgical technique used; the mental nerve was accessed Intraorally under local anaesthesia through a vestibular incision from 43 to 46 region of the teeth. (Fig. 1,2) The Mental nerve and its three branches were identified and avulsed separately.(Fig. 3,4)The nerve was carefully separated from the surrounding tissues and was held with artery forceps. (Fig. 5,6) The remaining nerve remnants were cauterized deeply. The mental foramen was blocked by bone wax.(Fig. 7) Suturing was done using 3-0 silk suture. (Fig. 8) Drugs like Antibiotics, anti-inflammatory, and carbamazepine were prescribed to patient

postoperatively for 5–7 days. The initial postoperative relief of pain was assessed during the 1st week after surgery. Patient is kept on regular follow up.

Fig. 1. showing profile Photograph

Fig. 2. Photograph showing vestibular incision

Fig. 3. Exposure of mental nerve and mental foramen

Fig. 4. Securing mental nerve with curved artery forceps

Fig. 5. Separating all the branches of mental nerve

Fig. 6. Nerve avulsed by winding around the artery forceps

Fig. 7. Blocking of mental foramen using bone wax

Fig. 8-. Closure of flap and suturing using 3-0 silk suture

DISCUSSION

A neuropathic facial pain syndrome known as TN is characterised as severe, short, shooting, typically unilateral, recurrent pain in one or more divisions during tooth brushing, face washing, talking, and eating. Given that the assaults of pain become more frequent, severe, and prolonged over time without receiving definite therapy, these patients frequently live in continual anxiety that the pain will return. They frequently consult with a variety of medical professionals in an effort to get relief from their suffering. According to reports, TN often manifests at its peak age after the fourth decade of life, with a little preference for females between the ratios of 2:1 and 3:23. The right side of the face is typically affected by the illness.Similar outcomes were seen in our study, the female-to-male ratio was 2.4:1, and most of the time it has facial involvement on the right side. The trigeminal nerve root or nucleus may be compressed by tumours, plaques from multiple sclerosis, aneurysms, or vascular abnormalities, resulting in classic TN or symptoms[4]. Classic TN patients experience pain attacks as a result of dysregulated voltage-gated sodium channel expression in the membrane and neurovascular compression in the trigeminal root entry zone, which results in demyelination[5].A recent study found that pathologicalvascular changes in peripheral vasculature leading to demyelination of the inferior alveolar nerve may have a role in the initiation and precipitation of pain in patients with TN. Mental Neurectomy is a minor, safe, and minimally invasive, daycare surgical procedure. Under local anaesthetic, it can be completed as an outpatient surgery. The trigeminal nerve's mental branch is cut in this procedure. It stops the transmission of afferent signals, ending painful episodes[5]. Mental Neurectomy is justified in treating pain in TN patients due to the demyelination of affected nerve fibres caused by peripheral vascular alterations, as evidenced on both histological and immunohistochemical investigation. It is specifically performed on elderly or disabled patients who are contraindicated for other invasive neurosurgery operations. In this trial, the procedure's risks included transient face swelling and sensory loss in the region supplied by the avulsed nerve. Patients with TN who are resistant to medicinal treatment, refuse significant neurosurgical treatments, or are deemed unfit for such procedures are advised to undergo peripheral neurectomy, which offers short- to medium-term effective pain control. The method is easy, secure, and successful for treating TN.

CONCLUSION

Due to the severity and intensity of the pain that the patient experiences, trigeminal neuralgia is still regarded as a life-

threatening condition; hence, the best course of action for treating such patients will be to concentrate on treating the disease's symptoms. The best way to treat the diagnosis is with medicine, which can be determined from the history and clinical symptoms. Surgery is an option if medical therapy is unsuccessful. For individuals with TN, mental nerve neurectomy offers effective short to medium term pain management. Following the operation, the pretreatment levels of pain, anxiety, and depression were significantly decreased.

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Case Report

HYPERPARAKERATOSIS MANAGEMENT USING DIODE LASER: A CASE REPORT

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ABSTRACT

Hyperkeratosis are benign lesions that presents in areas subjected to frictional trauma, mostly in areas near gingiva under the prosthetis placement and the corner of the tongue, usually trauma due to biting .During intraoral examination, hyperkeratosis tends to have a verruciform or corrugated appearance. Although hyperparakeratosis is benign, some precancerous lesions such as leukoplakia can mimic the characteristics of the hyperkeratosis (hyperparakeratosis or hyperorthokeratosis). The clinical examination of the lesion plays important role in the differential diagnosis between leukoplakia and hyperkeratosis; hyperkeratosis shows less definite margins than the Leukoplakia. And excision of the lesion can be done or topical application of steroid as clinician may see needful. Excision of Hyperparakeratosis lesions using LASER offers comparative advantages over traditional scalpel excision. Advantage of using laser include homeostasis, precision in removal, good patient acceptance, low morbidity and reduced postoperative complications. In the present case, patient reported minimal intraoperative and postoperative discomfort and the wound healing was also satisfactory.

INTRODUCTION-

Oral cancer is the sixth most common cancer worldwide and the researchers had well established the fact that almost all oral cancer starts with noticeable clinical changes in the form of white or red patches in oral mucosa & this established another theory of two-step process in cancer development [1]. According to the literature, Indian subcontinent shows the highest prevalence of oral cancer among all cancers in men [2]. These clinically visible white and red changes in oral cavity are labeled as “potentially malignant disorders (PMD) of oral cavity.” Clinically Oral Leukoplakia is seen as white lesion of more than 5 mm which cannot be scraped off and in most cases it can be differentiated from hyperparakeratosis which show less definite margins and mostly benign.

The present case evaluate the safety and efficacy of 940nm diode laser for treatment of Hperparakeratosis[3]. The objectives were to evaluate the healing of lesion and pain intensity at different time interval.

CASE REPORT-

A 30 year old male patient reported in department of Periodontology of surendera dental college with chief complain of bleeding gums since 8 years.On clinical examination white lesion spotted on left posterior region on gingiva which diagnosed as Leukoplakia.(Fig. 1)Patient had habit of tobacco placement in buccal vestibule region since 8 years. Family history of the patient was insignificant. On first visit complete oral prophylaxis was done and advised for cessation of tobacco. Patient was recalled after 3 days for treatment. On 2 nd visit a complete blood hemogram was done and all the values were within normal range. After procuring consent from patient complete removal of lesion with laser was planned. Pros and cons of procedure were discussed with the patient.

Under local anesthesia with 2% lignocaine and 1: 80000 adrenaline, laser assisted excisional biopsy was done removing the complete lesion. For the laser therapy, the patient and the surgical team used protection goggles. Laser assisted removal of lesion occurred with a diode laser surgical appliance (Fig. 2) A flexible optical fiber tip of 4mm emitted the laser light in pulsed mode.(Fig. 3) After surgical intervention coe-pac was placed in the region. The sample was fixed in 10% formalin and sent to the pathological anatomy laboratory.(Fig. 4) Here it was included in paraffin then 5-micron thick sections were made, stained with haematoxylin and eosin and analysed under an optical microscope. Approximately two weeks later the histological examination report was received. The biopsy shows the lesion as hyperparakeratosis lesion.

Fig. 1. Pre-operative

Fig. 2 - After excisional biopsy laser irradiation

Fig. 3 - After Laser irradiation

Fig. 4 - Post operative after 15 days

DISCUSSION-

Laser-assisted treatment has some advantages compared to traditional surgical techniques. Advantage of laser treatment is photocoagulation of lymphatic, hematic and nerve endings thus giving less intraoperative bleeding, less oedema and post-intervention pain. The placement of sutures is rarely necessary. The diode laser is a semiconductor laser and exists in different wavelengths: from 980 nm that has greater cutting capacity and fibres that do not need to be activated, up to 810 nm which has a more biostimulatory capacity. This laser has dual functionality .[4,5] The use of laser in treatment has two benefit the cutting capacity and help to reduce postoperative discomfort, oedema and to have a better, faster healing outcomes.

Different laser therapy for white lesion suggest different power settings in laser,In this case use of the diode laser was in pulsed mode and a frequency of 5000 Hz. The pulsed mode was chosen in order to avoid the harmful overheating of the tissue ,this mode allowed us to alternate a lower average power, that corresponded to the percentage of Ton in the period, with a high power peak equal to the maximum power set,thus setting an average power of 0.9 W and a peak power of 1.8W.

Conventional surgery may have some disadvantage like scar formation, contraction of wound, and contamination of the surgical field. Excision of precancerous lesions using LASER has comparative advantages over surgical excision. These advantages include a bloodless field because of the haemostatic effect, procedure is less painful, precision in removal, favourable healing, less scarring, less postoperative pain, swelling, oedema and infection resulting in good patient compliance, fewer complications and low morbidity .

Marek Vlk, Roman Smucle (2013) concluded that malignant transformation of leukoplakiacan occur even after the laser treatment,and therefore systemically follow up are necessary. White lesion like Leukoplakia show more recurrences and malignant transformation in tongue and oral base.[6]

CONCLUSION-

In this case using laser assisted excisional biopsy show positive results towards the outcome as complete removal of hyperparakeratotic lesion. Use of laser during treatment improve visibility of operating field because of minimal bleeding .and postoperative discomfort is not reported by the patient.so as conclusion we can state that use of laser in treatment of Hyperparakeratotic white lesion is good.

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Case Report

LINEAR GINGIVAL ERYTHEMA - A RARE CASE REPORT

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ABSTRACT

Linear gingival erythema (LGE), formally referred to as HIV gingivitis, is the most common form of HIV-associated periodontal disease in the HIV-infected population. Evidence suggests that this disease also occurs in HIV-negative immunocompromised individuals and is not specific to HIV infection. A 35 years old male patient presented with gingival inflammation in upper and lower anterior & posterior teeth mimicking LGE, but blood investigations showed HIV-negative status. The microbial sample from the affected area confirmed candida infection and antifungal therapy with scaling helped to resolve the lesion. This case report emphasizes that the clinician should investigate through medical history to diagnose such a condition. If there are signs and symptoms suggesting a systemic disease such as HIV, appropriate diagnostic testing such as blood testing or cytology must be considered. Patients with LGE should undergo laboratory diagnosis to ensure that any underlying disorder is diagnosed and treated at the earliest possible time.

Keywords: Linear Gingival Erythema, candidal infection, HIV-infection

INTRODUCTION

Linear Gingival Erythema (LGE) is also one of the seven oral manifestations commonly associated with HIV infection. LGE referred to as HIV/AIDS gingivitis is the most common form of HIV/AIDS-associated periodontal disease[1]. It is considered resistant to conventional plaque removal therapies, being considered nowadays as a lesion of fungal etiology. There is now evidence that this disease also occurs in HIV-negative immunocompromised individuals and is not specific to HIV infection. However, the prevalence of this lesion was significantly higher for HIV-infected individuals. Some data indicate a relationship between LGE and colonization of Candida species that can be concluded that LGE is another variant type form candidiasis in HIV/AIDS patients[2]. LGE is characterized clinically by a red-fired, linear band 2 to 3 mm wide on the marginal gingival accompanied by petechiae-like or diffuse red lesions on the attached gingival on the oral mucosa and may be accompanied by bleeding3. The prevalence of this lesion varies widely in different studies, ranging from 0 to 48% probably because in many of them, LGE was misdiagnosed as gingivitis. According to recent studies, the prevalence of LGE ranges from 2 to 25%. LGE, most commonly associated with the upper and lower anterior dentition, has been observed in pediatric patients4. Based on clinical experience, it has been determined that approximately 10% of children have this condition. These lesions usually do not cause clinical problems or interfere with nutrition.

Case Report

A 35year old male patient visited to the department of Oral Medicine and Radiology with the chief complaint of bleeding from gums since 1 month. The full case history was taken which did not reveal any medical problems. The patient dental history reveals burning sensation and peeling of marginal gingiva for 1 month. Intraoral examination revealed moderate plaque and calculus extending till the gingival third of teeth in both upper and lower dentition. Bleeding on gentle probing was seen, and was more profuse bleeding seen in the posterior region of both the jaws compared to the anterior region. Further gingival examination showed an erythematous linear band that extended approximately 2–3 mm from the free gingiva and extending the attached gingiva extending from canine to molar region in both upper and lower dentition. [Fig1a,b] & [Fig 2] On extraoral examination, it was noticed that the patient had class 1 malocclusion with competent lips. The lesion causes clinical problems or mild interference with nutrition. The treatment plan was made which included a plaque and supragingival calculus removal on the first visit. The patient was given oral hygiene instructions and also advised for proper brushing techniques. The patient was also advised to use a chlorhexidine mouthwash for 2 weeks to decrease the bacterial load. The next visit after 2 weeks involved scaling and removal of any subgingival calculus. The patient's condition did not show any relief in that span of time.

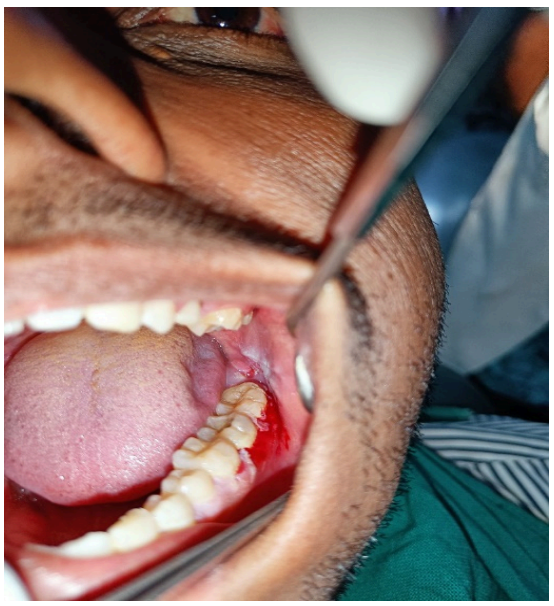

Fig1 (a) Erythematous linear band wrt lower left posterior teeth

1(b) Erythematous linear band

Fig 2 Front Occlusal view.

To diagnose the causative factor, a full blood analysis was done including the HIV status of the patient. The report of the patient was normal with all the complete blood count within normal range and the HIV status was negative. The patient's hemoglobin percentage was also normal stating that the patient was neither anemic nor immunocompromised. To discover the etiology, a microbial sample from the gingival area was taken. This sample was used for culture in Sabouraud Dextrose Agar (SDA) which showed Candida colonies after 3 days of incubation. To confirm the Candida albicans as the causative factor, the germ tube test was done which came positive. Now, the treatment plan included antifungal therapy. The patient was prescribed topical antifungal drug nystatin cream 100,000 units 4times per day for 2 weeks. The patient showed remarkable improvement with no red band seen in the lower gingiva within 1 week.

DISCUSSION

LGE, formally referred to as HIV-gingivitis, is the most common form of HIV-associated periodontal disease in the HIV-infected population[5]. There is now evidence that this disease also occurs in HIV negative immunocompromised individuals and is not specific to HIV infection[6]. However, the prevalence of this lesion was significantly higher for HIV-infected children[7]. In the above case, the fact that this patient presented typical LGE lesions, which were resistant to conventional plaque-removal therapies, has led to a microbiological investigation. This investigation provides strong evidence that LGE in non-HIV-infected patients may be considered of fungal etiology since Candida species were isolated from LGE lesions. C. albicans was the most frequent species isolated, seen in five of six patients, which confirms that such yeast is the main etiologic factor of mucosal candidiasis[8]. These findings are similar to the study of Velegraki et al. (1999) in which HIV-pediatric patients presented LGE with positive cultures for Candida[9]. They are also in agreement with the consulted literature which classifies LGE as a lesion of fungal etiology[10].

LGE is characterized by intense gingival inflammation which does not respond to scaling and root planning or oral hygiene

control. LGE may sometimes be unresponsive to corrective therapy, such lesions may undergo spontaneous remission. LGE-like lesions can sometimes be adequately managed by following the therapeutic principles associated with marginal gingivitis. However, as mentioned previously, it has been suggested that gingivitis lesions that respond to conventional therapy do not represent LGE. The affected sites should be scaled and polished. Subgingival irrigation with chlorhexidine or 10% povidone-iodine may be beneficial. The patient should be instructed regarding the meticulous oral hygiene procedures. The condition should be reevaluated 2–3 weeks after initial therapy. If the patient complains about home care procedures and the lesions still persist, the possibility of a candida infection should be considered. The first treatment should be topical antifungal therapy, that is, oral nystatin suspension 2–5 mL, 4–6 times/ day or clotrimazole troches 10-mg tablet, 3–5 times/day but it is doubtful that topical antifungal rinses will reach the base of the gingival crevices. Consequently, the treatment of choice may be the empiric administration of a systemic antifungal agent for 7 days such as fluconazole 3–5 mg/kg once daily or itraconazole 100 mg/day orally for children > 3 years of age or ketoconazole 5–10 mg/kg/day. It is important to note that LGE is often refractory to the treatment. If so, the patient should be carefully monitored for developing signs of more severe periodontal. conditions (e.g. necrotizing ulcerative gingivitis, necrotizing ulcerative periodontitis, necrotizing ulcerative stomatitis). The patient should be placed on a 2- 3-month recall maintenance interval and retreated as necessary[11].

A differential diagnosis included:

A. HIV-associated linear gingival erythema (LGE)

B. Chronic marginal gingivitis

C. Candida-induced LGE

D. Herpetic gingivostomatitis

CONCLUSION

LGE is not always associated with HIV infection. The clinician should obtain a thorough medical history to investigate such a condition. If there are signs and symptoms suggesting a systemic disease such as HIV, appropriate diagnostic testing such as blood testing or cytology must be considered. Patients with LGE should undergo laboratory tests to ensure that any underlying disorders are diagnosed and treated at the earliest possible time.

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Case Report

ENDODONTIC MANAGEMENT OF MAXILLARY FIRST MOLAR WITH TWO CANALS IN MESIAL ROOT - A CASE REPORT

Amandeep Sachdeva, Neetu Jindal, Renu Aggarwal, Monika Choudhary

ABSTRACT

A thorough knowledge of root canal anatomy is a basic prerequisite for the successful completion of the endodontic treatment. Awareness and understanding of the presence of unusual external and internal root canal morphology contribute to the successful outcome of root canal treatment. The case reported in this article was about two canals in the mesial root of the maxillary first molar. The occurrence of the second mesiobuccal canal is a common variation. Complex root canal anatomies have been conventionally diagnosed by radiographs, which provide sufficient information to the clinician. Failure to find and treat the existing MB2 canal will decrease the long-term prognosis.

Keywords:- Maxillary molar, Root Canal Treatment, MB2 canal.

INTRODUCTION

A thorough knowledge of root canal anatomy is a basic prerequisite for the successful completion of the endodontic treatment.[1] Awareness and understanding of the presence of unusual external and internal root canal morphology contributes to the successful outcome of the root canal treatment. Maxillary molars are known to have an additional canal (MB2) in the mesiobuccal root. The occurrence of second mesiobuccal canal is a common variation. Weine (2004) stated that frequent failure of endodontic treatment in maxillary first permanent molar teeth was likely due to the failure to locate and fill the second mesiobuccal canal.[2] Wolcott et al, have shown that failure to find and treat existing MB2 canal will decrease the long-term prognosis.[3,4]

Stropko conducted a study on 1096 maxillary first molars over an 8-year period and concluded that MB2 canals were found in 93% with the use of surgical operating microscopes and 73.2% of first molars with and without the use of surgical operating microscopes.[5] Somma et al, studied the root canal morphology of 30 extracted human maxillary first molars with the aid of micro CT and concluded that the mesiobuccal root canal anatomy was complex, with incidence of MB2 root canals, presence of isthmuses, accessory canals, apical delta and loops.[6]

For more accuracy the use of CBCT and magnification enhances the accuracy.[7] Although periapical and panoramic radiography produce acceptable details in the mesiodistal direction, the observation of details in the bucco-lingual dimension is inadequate.[8]

This paper present a clinical case of a maxillary first molar with an occurrence of the additional canal in the mesiobuccal root i.e MB2.

CASE REPORT

A 25-year-old male patient reported with a chief complaint of continuous and radiating pain in relation to the right maxillary first molar for several days. On clinical examination, the patient's oral hygiene was found to be fair. A dental examination revealed a right maxillary first molar with a deep carious lesion and there was a full coverage restoration in relation to the right maxillary second molar.

The patient also complained of episodes of sensitivity to hot and cold in the involved tooth. The patient gave a lingering response on hot and cold vitality tests. So, a clinical diagnosis of acute irreversible pulpitis was made.

A preoperative radiograph was obtained [Figure 1]. After a detailed clinical and radiographic examination, the right maxillary first molar was prepared for endodontic therapy.

Fig 1. Pre-operative radiograph

After the administration of local anesthesia, the tooth was isolated with a rubber dam, and a conventional endodontic access opening was made. After removing pulp tissue located in the chamber, four orifices were observed – palatal, mesiobuccal and distobuccal located in regular locations and an extra orifice was located near the palatal orifice. The conventional triangular access was modified to a trapezoidal shape to improve access to the additional canal [Figure 2].

Fig 2. Access opening

The working length of each canal was estimated by a radiograph [Figure 3] and then the access cavity was closed with a temporarily closed dressing after placement of calcium hydroxide as intracanal medicament.

o The observation from the working length radiograph suggested that the instrument was in the extra canal of the mesiobuccal root i.e MB2.

Fig 3. Working length radiograph

o In the next visit, biomechanical preparation of canals was done under irrigation with 5% sodium hypochlorite (Amble healthcare Pvt. Ltd.,india) and 17% EDTA by using rotary file system(Hyflex CM, Coletene).

o Then, the canal was dried with absorbent point and obturated with medicated Endomethasone sealer (Septodont) and gutta-percha points using lateral condensation technique.

o The access cavity was then restored with Composite followed by rehabilitation of tooth with full coverage crown [Figure 4].

Fig 4. Post-operative radiograph

DISCUSSION

The majority of endodontic literature describe the maxillary first molar as having three roots and four root canals, with two canals in the mesiobuccal root. In most of the teeth, the location of MB2 orifice opening is usually found mesial to an imaginary line between the MB1 and palatal orifices, and at about 2 to 3 mm from the MB1 orifice.

Several methods have been presented to help locate the fourth canal. Foremost was a modification of the access preparation to a rhomboidal shape for maxillary molars as compared to the classical triangular outline. This provides better visibility and accessibility. Thorough probing of the fissure or groove between the main canals was proposed in order to locate the orifice of another canal.

This fissure or groove must often be deepened to remove any projections that might conceal the opening of the fourth canal. A troughing process must be accomplished with burs or ultrasonic instruments if the MB2 orifice was not easily identified.

The MB2 canal can be challenging to negotiate. The MB1 canal normally departs the pulpal floor with only a slight mesial inclination. However, the MB2 canal usually has a marked mesial incline immediately apical to its orifice in the coronal 1 to 3 mm, so when an attempt is made to instrument the MB2, the tip of file tends to catch against the mesial wall of canal, preventing apical progress. Because the MB2 canal is smaller and usually more calcified than MB1, the problem is exacerbated.

Tachibana concluded that applicability of computed tomography (CT) for endodontics allowed the observation of the morphology of the root canals, the roots, and the appearance of the tooth in every direction.[10] Gurmeet Singh et al, have used SCT for the confirmatory diagnosis of morphological aberrations in the root canal anatomy.[11] In the present case, working length radiograph revealed that the orifice was that of MB2 canal.

Of all the canals in the maxillary first molar, the MB2 can be the most difficult to find and negotiate in a clinical situation. Instrumentation of this tooth, especially with respect to the mesiobuccal root, can be complicated. Failure to detect and treat

the second MB2 canal system will result in a decreased long-term prognosis. Stropko observed that by scheduling adequate clinical time, by using the recent magnification and detection instrumentation aids and by having thorough knowledge of how and where to search for MB2, the rate of location can approach 93% in maxillary first molars[12]

CONCLUSION

Additional canal such as MB2 in maxillary molar is a frequently encountered clinical situation. Usually, this additional canal is located adjacent to MB1 but in this instance, it is found to be adjacent to palatal orifice. Such aberrant location and confirmation were possible with the use of intra oral periapical radiograph. The finality in locating the canal especially in challenging situations buttresses the need for use of non-invasive and advanced gadgets such as CBCT.

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Case Report

MANAGEMENT OF DENTAL FLUOROSIS USING RESIN INFILTRATION- A CASE REPORT.

Dr. Silvie Verma, Dr. Suruchi Juneja Sukhija, Dr. Shital Dalvi, Dr. Aditi De

ABSTRACT

Dental fluorosis is a developmental disorder that affects the hard tissues of the teeth, primarily the enamel, and is characterized by white or yellowish lesions brought on by excessive exposure to fluoride. Fluorosis can significantly affect the tooth's appearance, structure, and form, posing a serious aesthetic worry for those who have this condition. Depending on the disease's severity, several therapies are advised for treating dental fluorosis, from tooth whitening to prosthetic crowns in extreme situations. Fluorosis can significantly affect the tooth's appearance, structure, and form, posing a serious aesthetic worry for those who have this condition. Depending on the disease's severity, several therapies are advised for treating dental fluorosis, from tooth whitening to prosthetic crowns in extreme situations. In this case study, a patient with mild dental fluorosis of the upper anterior teeth was treated using the resin infiltration approach which produces an acceptable improvement of the appearance of affected tooth. In this instance, the resin infiltration technique offered the patient a conservative and affordable method of treating mild to moderate dental fluorosis, improving the patient's appearance without suffering a sizable loss of tooth structure.

INTRODUCTION

Dental fluorosis is a disease caused by excessive deposition of fluoride in enamel featured with white or yellowish lesions on tooth surface. This causes disruption in enamel development and results in hypomineralization of the enamel and giving the appearance of white or yellowish lesions on tooth surfaces.[1] Fluoride disturbs enamel formation by reducing calcium ion concentration in the matrix which then interferes with protease activity, thus delaying or inhibiting enamel matrix protein degradation.[2] This condition affects both function and aesthetics and it mostly occurs in the population residing in areas with a considerable amount of fluoride in tap water since the pediatric age.[3]

Recommended intake of fluoride for primary prevention of caries is reported to be 0.05 to 0.07 mg F/Kg/day and, when concentration is more than 1.5 to 4 mg/L as the World Health Organization (WHO) recommends, dental fluorosis occurs. In this perspective, an important issue is to prevent the abnormal intake of fluoride in children and it has to be advised by parents and health care figures by paying attention to dental hygiene habits, to feeding and tap water drinking.[4]

Clinically, dental fluorosis can be seen as diffuse, symmetrical, discoloured white opaque stains and striations in mild to moderate cases. However, in severe forms; porosity, pitting, and brownish areas associated with fragile enamel can often be seen on the surface of the tooth.[5]

Several treatment strategies were proposed for dental fluorosis, they depend on the severity and extent of the disease. Great attention has been devoted to the noninvasive treatment of various enamel lesions. Resin infiltration is a minimally invasive technique for the management of smooth surface and proximal non-cavitated enamel lesions. Several remineralization products have been presented to this end, such as fluoride, casein phosphopeptide, amorphous calcium phosphate, and microabrasion.[6] Low-viscosity light-cured resins are another popular approach.[7] The infiltration of resins creates a diffusion barrier inside the enamel lesion body, retarding enamel dissolution, and the retention loss is unlikely to occur.8

It is a novel technology that bridges the gap between prevention and restoration of carious lesions up to the first third of dentin (D-1) and can camouflage aesthetically disfiguring white lesions on the buccal surface. It is marketed under the name Icon® (DMG America Company, Englewood, NJ) and is described as a micro-invasive technology that fills, reinforces, and stabilizes demineralized enamel without sacrificing the healthy tooth structure.[9]

The principle of resin infiltration is to perfuse the porous enamel with resin by capillary action, thereby arresting lesion progression by occluding the microporosities that provide diffusion pathways for the acids and dissolved materials. This technique aims to create a diffusion barrier inside the lesion and not on the lesion surface.[10] Icon® is marketed in two different forms: proximal

surface and vestibular surface kits a preparation phase is required where the surface of the teeth is cleaned and prepared with 15% hydrochloric acid (icon etch) for 2 minutes and stirring the gel from time to time during application with a microbrush 5% HCL produces a penetration depth of 58 μm, which is more than twice that of phosphoric acid (25 μm), enabling penetration into the deepest part of the lesion, thus eliminating the decalcified areas, preventing further attacks.[11] Ethanol wet bonding technique is used to desiccate the surface by applying 99% ethanol (Icon Dry) for 30 seconds followed by air drying. It is based on the assumption that it will coax hydrophobic monomers to infiltrate into demineralized wet enamel or dentine, and improve the efficacy of penetration of the hydrophobic infiltrate (TEGDMA) to get a well-defined, resin-infiltrated layer.[2]

The recommended application of resin infiltration was for the treatment of hypomineralised areas of tooth tissue, and caries management. Other treatment options of microabrasion, whitening, composite restoration or veneers, are potentially more invasive. Thus, making it a viable option for the management of early dental caries on anterior teeth. Resin infiltration has the advantage of being noninvasive, and also minimal invasive treatment becoming more likely as first option of treatment.[12]

The objective of this article is to report the outcome of the treatment provided by using resin infiltration on non-cavitated discoloured anterior lesions.

CASE REPORT

A 9 year-old female student visited to the Department of Pediatric and Preventive Dentistry seeking treatment to improve the aesthetic appearance of her upper front teeth. Upon intra-oral examination, there was generalized fluorosis was observed, with mild severity of score of 2 based on Dean's Fluorosis Index (DFI) on both upper and lower anterior teeth (Figure 1). The patient demonstrated optimal oral hygiene level with satisfactory periodontal health and is systemically healthy. The initial treatment plan proposed and agreed to by the patient, which was to mask the mild to moderate fluorosis of upper anterior teeth with resin infiltration. Prior to the commencement of the resin infiltration procedure, scaling and dental prophylaxis was carried to ensure the teeth are clean, free of plaque and calculus. Excess prophylaxis paste was then rinsed away using a water syringe. Gingival barrier was used to the respective teeth to protect the soft tissue and ensure a clean and dry working area (Figure 2).

Following the manufacturer's instructions, resin infiltration procedure (Icon, DMG Chemisch-Pharmazeutische Fabrik GmbH, Hamburg, Germany) was initiated on the maxillary incisors (DFI = 2), The labial enamel surface of the teeth was etched with 15% hydrochloric acid gel (ICON-Etch, DMG Chemisch-Pharmazeutische Fabrik GmbH, Hamburg, Germany) for 120 seconds . The etchant gel was then rinsed away for 30 seconds using water spray and gently dried. (Figures 3) At this stage, frosty appearance will become more evident on the fluorosed area. Drying agent (ICON-Dry, DMG Chemisch-Pharmazeutische Fabrik GmbH, Hamburg Germany) applied onto the tooth surface for 30 seconds to ensure desiccation of the enamel surface (Figure 5). Subsequently, resin infiltrant agent containing tetramethylene glycol dimethacrylate (TEGDMA) (ICON-Infiltrant, DMG Chemisch-Pharmazeutische Fabrik GmbH, Hamburg, Germany) was applied on the treated surface and allowed to penetrate for three minutes. This was deemed adequate in ensuring the maximal infiltration process (Figure 5). Excess resin infiltrant was removed using a cotton roll and dental floss for interproximal areas, followed by light-curing on each tooth for 40 seconds. The patient was satisfied with the final outcome of the treatment. There was a marked improvement in the appearance of the concerned tooth as white lesions managed to be masked following the treatment.

Figure 1. Preoperative picture showing dental fluorosis with DFI 3 wrt 11,21

Fig. 2 Application of gingival barrier

Fig. 3 Application of etchant wrt 11,21

Fig. 4 Application of resin infiltrant wrt 11,21

Fig. 5 Post Operative Picture

DISCUSSION

Minimal invasive dentistry and aesthetics have consistently been incorporated into modern treatment techniques. With a conservative approach in mind and the goal of preserving as much tooth tissue as possible, it is always difficult to meet patient expectations regarding appearance as part of complete oral care.[13]

Many people have aesthetic concerns about tooth discoloration, particularly dental fluorosis, especially in the anterior region where it is more noticeable to others.[5]

Additionally, it has been observed that people today are more inclined towards non-invasive dental procedures.[14] The resin infiltration technique was successful in improving the aesthetics of the problematic teeth for the patient mentioned in this case report using a non-invasive method.

The success of the resin infiltration technique is highly dependent on case selection. A combined method or a more intrusive restorative procedure, such as a cosmetic veneer, should be offered to patients with a significant level of fluorosis. Such alternatives were, however, ruled out because the patient's main worry in this case was primarily white patches/flakes on anterior teeth.

The patient is still young, and any attempt to offer prosthetic therapy will result in the needless destruction of tooth structure from relatively virgin teeth. This is why the resin infiltration procedure was chosen. Since this method is more affordable and can generate a quick favourable result in just one consultation when compared with direct and indirect veneer, other treatment options were not considered for this patient. Additionally, the technique is painless because it does not require local infiltration, as is the case with other restorative methods.[15] As it has only been proven to be useful in treating milder forms of fluorosis and raises concerns about the destruction of tooth structure, micro abrasion is not appropriate in this situation.[16]

Vital teeth whitening, which may be done at home or in a dental facility, would be another non-invasive therapy option for this patient. One of the limitations of home bleaching is that both fluorosed and non-fluorosed portions of the teeth would be

exposed to the bleaching solution for a lengthy period of time (14 days). Additionally, patients frequently complain of post-treatment sensitivity from at-home bleaching, which may make them less compliant with the actual treatment.[17] To reduce the chance of tooth hypersensitivity, which can make treatment take longer if the desired shade is not obtained, in-office bleaching therapy also necessitates numerous visits.

The current infiltrant agent is a clear, unfilled composite resin with low viscosity, high surface tension, and low contact angles relative to the enamel, allowing the infiltrant to penetrate the diseased layer of enamel's honeycomb-like porosity through capillary forces.[18]

Regarding the cosmetic appearance of the teeth as well as the length and expense of the treatment, the clinical outcome of the procedure revealed outcomes that were satisfactory to the patients.

CONCLUSION

This case study illustrated the efficacy of resin infiltration as a treatment for dental fluorosis of mild to moderate severity, enhancing the tooth's appearance by covering white patches on enamel in a single visit. It is also regarded as a secure and minimally intrusive method of treating the unsightly condition of teeth caused by dental fluorosis.

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Case Report

ADENOMATOID ODONTOGENIC TUMOR- A TYPICAL CASE REPORT

Dr. Manish Kumar, Dr. Gurveen Chawla, Dr. Vikrant Rai, Dr. Bhavana Soni

Odontogenic Tumors are a group of diverse range of lesions that affect maxillary and mandibular bone tissue. These are highly infrequent and they originate from odontogenic epithelium and odontogenic ectomesenchyme. However, these tumors show a huge variability in clinical and histopathological characteristics.[1,2] The AOT is the fourth most common odontogenic tumor, appearing in 2-7% of cases.[3,4] It arises from odontogenic epithelium, for instance, from the enamel organ, reduced enamel epithelium, Cell rests of Malassez or Cell rests of Serres.[5] It exhibits duct-like structures and tubular characteristics microscopically similar to ameloblastoma which led to this lesion being designated as "adenoameloblastoma."[6]

Philipsen and Birn gave the terminology of "Adenomatoid Odontogenic Tumor" in 1969 that was highly accepted by World Health Organization.[7] The WHO defines it as a tumor composed of odontogenic epithelium in a variety of histoarchitectural patterns, embedded in a mature connective tissue stroma and characterized by slow but progressive growth.[8] It is interesting to note that AOT is also named as "two thirds tumor" for two thirds of the cases present in the anterior maxilla, in women, associated with an included tooth of which two thirds is the canine and two thirds of the intraosseous type present radiopacities within the lesion. Along with that cortical expansion and adjacent tooth displacement are frequently seen.[9,10,11] It is highly important to differentiate AOT from other pathologies, for example, ameloblastoma and keratocyst because the later require aggressive treatment, whereas, AOT requires conservative treatment because it has low recurrence rate. Adenomatoid odontogenic tumor appears in 3 clinical variants: follicular, extrafollicular, and peripheral type.[12] Now, a case of AOT is presented emphasizing the importance of accurate diagnosis of such lesions for its efficient management.

CASE REPORT

A 20-year-old female patient reported with a chief complaint of painless swelling and facial asymmetry on the right side of the maxilla. On the extra oral examination, an increase in the contour of the right maxilla was observed, however, no change was observed in the skin coloration.

Intraorally, vestibular cortical expansion on right maxilla, with a swelling of 3cm × 1.5cm extending from the distal of lateral incisor to the right premolar region. Displacement of the right canine and right lateral incisor is observed (Figure 1). Moreover, the lesion was not associated with any history of trauma, pain, and lymphadenopathy. The skin over the lesion and the surrounding area appeared normal and the margins were diffuse. The swelling was firm in consistency. On palpation, swelling was non-tender, non-fluctuant, non-pulsatile, non-compressible, and non-reducible with no discharge. Aspiration of the lesion was done, which was negative.

Figure 1: Intra oral swelling displacing the adjacent teeth.

The treatment, initially, consisted of an incisional biopsy which histopathologic study reported the definitive diagnosis of Adenomatoid Odontogenic Tumor. Posteriorly, under general anesthesia, enucleation and curettage was performed as definitive treatment. (Figure 2) At 6-month follow-up, the patient showed no signs of clinical or imaging recurrence.

Figure 2: Enucleation and curettage

The histopathological sections revealed fibro collagenous tissue lined focally by a stratified squamous epithelium with a superficial nodular proliferation of round to polygonal cells in solid sheets (Figure 3) and duct-like structures (Figure 4 and 5) and rosettes suggestive of odontogenic epithelial cells (Figure 6). Eosinophilic fibrillar material was present between tumor cells and within duct-like structures. Based on these findings, a histopathologic diagnosis of adenomatoid odontogenic tumor was made.

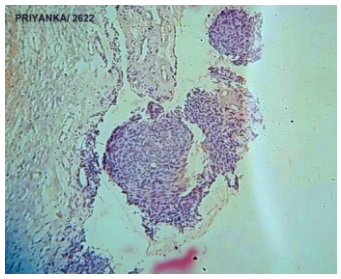

Figure 3: Odontogenic epithelium shows superficial nodular proliferation

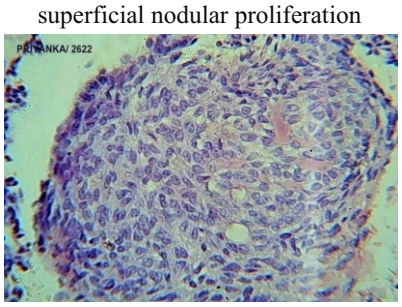

Figure 4: Duct like structure and eosinophilic material scattered in the tumor island.

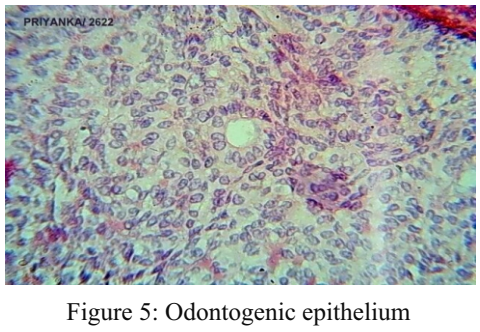

Figure 5: Odontogenic epithelium showing duct like structure

Figure 6: Odontogenic epithelial cells showing rosette pattern

DISCUSSION

The earliest reported case of AOT was from Norway by Harbitz in 1915.[13] Stafne reported the first series of adenomatoid odontogenic tumor in 1948 under the title "epithelial tumours associated with developmental cysts of the maxilla."[14] Bernier and Tiecke were the first to publish a case using the name "adeno-ameloblastoma." In an attempt to "remove unjust stigma from this lesion" and to eliminate the risk of unnecessarily mutilating surgery for patients who had the tumor that seemed to be occurring because of use of the term "adenoameloblastoma," in 1961, Gordon introduced the term "ameloblastic adenomatoid tumour." Philipsen and Birn proposed the name "adenomatoid odontogenic tumour" in 1969. Shortly thereafter, the term was adopted in the initial edition of the World Health Organization's Histological Typing of Odontogenic Tumors, Jaw Cysts and Allied Lesions in 1971 and was retained in the second edition in 1992.[15]

The AOT originates from the odontogenic epithelium from the rests of the dental lamina located in bone, mucosa and the gubernaculum canal. There are three variants depending on the location: follicular, extrafollicular and peripheral[15,16] The intraosseous follicular and extrafollicular variants constitutes about 96% of the cases.[17] The follicular variant is associated to the gubernaculum canal, which contains a fibrous band with rests of the dental lamina, connecting the peri coronal follicle of a permanent tooth with the alveolar mucosa and occasionally the rests of the dental lamina from the deciduous teeth can also migrate within de gubernaculum canal[5,7] The extrafollicular variant is associated to rests of the dental lamina that remained in the bone after the development of the deciduous germ.[5] The peripheral variant is associated to rests of the dental lamina in the alveolar mucosa and is seeing clinically as a gingival overgrowth.[16,18]

Wide age range from 3 years to 82 years has been observed in patients with Adenomatoid odontogenic tumor. AOT has high predilection for young patients that is 69% cases are diagnosed between the ages of 10 and 19 years. The tumor is common in women than men.[15]

As far as location is concerned AOT may occur anywhere within the jawbones or the gingiva. In early age patients it is most commonly seen in Maxilla.

Majority of patients with AOT are asymptomatic; with delayed eruption of permanent tooth especially in anterior maxilla, or slow-growing bony expansion commonly lead to the discovery of adenomatoid odontogenic tumor.[15,19,20]

Clinically, gingival lesions cannot be distinguished from gingival fibromas, peripheral giant cell lesions, peripheral cemento-ossifying fibromas, or from other peripheral odontogenic tumors, such as ameloblastoma, odontogenic fibroma, calcifying odontogenic cyst, and calcifying epithelial odontogenic tumor.[15]

The lesion is usually unilocular and radiolucent, containing fine calcifications (a feature that differentiates it from other lesions) which is well demarcated with smooth cortical border. Displacement of neighboring teeth is a more common finding compared to root resorptions. Approximately, 78% of adenomatoid odontogenic tumors show calcified deposits and are

associated with the crown of an unerupted permanent tooth in 71% of cases.[6,15,18]

CONCLUSION

Adenomatoid odontogenic tumor is an uncommon odontogenic lesion, but it can be usually identified from its clinical, radiographic appearance and histopathologic appearance. The reported case presented the typical features describe in the literature, for instance, age, gender, anatomic region, slow growing, tooth displacement and no root resorption. On the other hand, the size was bigger (4 cm). There was no recurrence after conservative treatment. Identifying the features of this tumor allows differentiating it from other entities that required a different surgical management. It is important to correctly distinguish and diagnose this lesion to eliminate the risk of unnecessarily mutilating surgery for patients. Conservative surgical enucleation is the treatment of choice as the lesion is well encapsulated and can be separated from the bone easily. Also, its recurrence is very rare.

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Case Report

ODONTOGENIC FASCIAL SPACE INFECTION " A THREATENING DISEASE IN HEAD AND NECK REGION"- LEFT SUBMASSETRIC, BUCCAL AND SUBMANDIBULAR SPACE INFECTION IN NON-DIABETIC PATIENT -A CASE REPORT

Dr. Vinod Mehra, Dr. Manisha Solanki, Dr. Puspadip Kharel, Dr. Harish Vaishnav

ABSTRACT

In dental practice Odontogenic infections is common complications due to infected or decayed tooth. Most of the people respond well to current medical intervention of antibiotic, incision and drainage and hydration therapy. some Odontogenic infections can spread to vital and deep structures, especially in immunocompromised or weakened patients and even prove fatal.[1] Space infection can be dangerous as it can spread rapidly and can be life threatening which can lead to airway compromise therefore importance is given for airway maintenance in head and neck space infection. A case of extensive space infection involving left submassetric, buccal and submandibular spaces is presented, followed by surgical intervention (incision and drainage) under I.V antibiotic coverage followed by oral medication.[2]

Keywords- Odontogenic infection, Space infections, Incision and Drainage.

INTRODUCTION

Odontogenic infections are quite common and can be resolved by early medical intervention – but in some cases complications can occur which can result in mortality and morbidity of patients. Odontogenic infections are secondary to pulp necrosis, periodontal disease, pericoronitis, apical lesions or certain dental procedure complication.

The spread of infection depends upon host and their immunity to withstand bacterial load. The systemic condition of the patient determine the host resistance. Systemic condition such as Diabetes mellitus, HIV/AIDS ,alcoholism weakens the immune system, thus these person are more suspectable to infections .Before antibiotic era the mortality rate was 50% but after discovery of antibiotic and advanced imaging technique and surgical intervention the mortality rate has gone down to 8%. But however in past 10 to 15 years due to antibiotic abuse again difficulty started to arise in such cases.[4,6]

The location of the infection is important to determine the severity and airway obstruction. proper anatomical identification is important for airway management, which determine the time period of patient stay in hospital.[3]

Proper history, early diagnosis and treatment is essential in reducing the severity, We describe a case of severe odontogenic infection involving left submassetric, buccal and submandibular spaces.

CASE REPORT-

A 30 year male patient reported to the department of oral and maxillofacial surgery of surendera dental college and research institute with chief complaint of pain and swelling in left side of face since 12- 15 days. Pain was moderate and continuous which gradually increase in severity, throbbing and continuous in nature aggravated during night & on mastication & radiated to the left side of ear & temporal region. Patient consulted local dentist for the pain and took medications. After taking medication swelling reduced in size and pus discharged extra orally through draining sinus but pain did not subsided.pain increased in severity associated with swelling from last 6-7 days. History of pus discharge(Extra orally) after taking medications, No other swelling present.

Fig1- Front profile of patient

Fig2- left lateral view, Photograph showing swelling in submandibular region and extraoral draning sinus

Extra oral examination- On extraoral examination there was swelling on left lower part of face ,swelling was diffuse and surface was smooth .There were 2 swellings one in the submandibular region approx 1x1 cm, second at the mandibular angle region approx 2x3 cms, confined to masseter muscle area and submandibular swelling was extended from middle of the body of mandible 1cm towards the lower border of mandible and swelling at the angle region was extended from 1 cm from the ear lobule to posterior border of ramus of mandible.

On Palpation-Swelling was warm and tender, fluctuant, compressible, non pulsatile, non

reducible and soft in center and endurated in periphery, epsilateral submandibular lymphnodes was tender and palpable

Intraoral examination-mouth opening was reduced to approx less than 1 finger and left vestibular sulcus was obliterated and 36 root stump and 38 decayed tooth was present.

Fig3-Intraoral Photograph showing poor oral hygiene

Fig4-Photograph showing left buccal vestibular obliteration and carious 36 & 38

Provisional diagnosis of left submassetric, Buccal and submandibular space was made, Complete blood count and viral marker test was done, and patient was planned for incision and drainage under local anesthesia.

SURGICAL TREATMENT DONE-

Extra oral incision used (apprx.2 cms below lower border of mandible).A curved hemostat was inserted through incision into the submandibular and submassetric space. Buccal space was explored from existing sinus tract that was present extra orally. The beaks of hemostat are opened , purulent discharge was drained. Corrugated rubber drain inserted in buccal,submandibular spaces and secured with 3-0 silk suture. Patient was kept on observation and regular irrigation and Dressing done. Empirical IV Antibiotic were given i.e, augmentin 1.2 gm and metronidazole 500 mg.

Fig5-Photograh showing Incision, given apprx. 2 cms below lower border of mandible

Fig6-Curved hemostat used to explore spaces (Hilton's Method)

Fig7-Photograph showing draning pus from explored spaces

Fig8-Photograph showing Extracted decayed tooth 38 and 36

Fig9-Corrugated rubber dam secured with 3-0 silk suture

DISCUSSION-

In head and neck region odontogenic infection are most common. Early conservative treatment of tooth like root canal treatment or extraction of decayed tooth or early incision and drainage helps to prevent from severe complications.there are many facial spaces in head and neck region. These areas are POTENTIAL SPACES BETWEEN FASCIAL LAYER or compartments containing connective tissues and various anatomic structures. They are not voids in the tissues

MANAGEMENT OF ACUTE ODONTOGENIC INFECTION

Supportive management include, Administration of antibiotics, Hydration, IV fluid of patient Analgesics, Bed rest, Application of heat in the form of moist packs, Warm saline Mouth rinse. SURGICAL Treatment Depend on stage of infection, Extraction of tooth, Incision & Drainage (HILTON'S METHOD) or Both

ANTIBIOTICS can be used by doing Culture & antibiotic sensitivity Test/gramstain , Bactericidal [aminoglycosides, cephalosporins, penicillin etc.] antibiotic are preferable, Narrow spectrum of antibiotics should be used that will affect the organism involved in a particular infection .Less toxic antibiotics should be selected, If patient is allergic to penicillin, Erythromycin is the substitute,If infection is severe then I.V should be used. Avoid combination of antibiotics in treatment of odontogenic infection increase the chance of toxicity, allergy ,resistant to bacterial strains and superinfections [5,7]

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Case Report

TREATMENT OF GINGIVAL ENLARGEMENT USING ELECTROCAUTERY- A CASE REPORT

Dr Harsha, Dr Rajni Aggarwal, Dr Amit Khunger, Dr Deepika Choudhary

ABSTRACT

A tooth and the nearby gingiva cannot be separated cosmetically. When the tissues that surround the teeth are strong and healthy, aesthetic dentistry can be performed successfully. A typical symptom of gingival disorders, gingival enlargement is described as an increase in the size of the gingiva, also known as gingival overgrowth. There are several different causes of gingival expansion, including plaque-induced gingivitis and systemic hormone imbalances. This case study features a 15-year-old male patient who had gingival hyperplasia on his teeth as a result of plaque buildup brought on by poor oral hygiene maintenance, which is the primary etiological cause of this inflammatory gingival hyperplasia. After non-surgical treatment, electrosurgery was used as surgical treatment to eradicate hyperplasia. The patient received effective care. Electrosurgery is an application of electrically generated heat energy to tissue to alter it for therapeutic purposes.

Key Words: Chronic inflammatory enlargement, gingival disease, Electrosurgery and Gingivectomy.

INTRODUCTION

Gingival enlargement is the pathologic enlargement of the gingiva having multiple etiologies. There are two types of gingival enlargement: plaque- and non-plaque-induced. Surgery can be used to reconstruct the gingiva for aesthetic, physiological, or functional reason.[1] The ability to perform oral hygiene measures is compromised in some patients with gingival enlargements, which may be further complicated by the presence of prosthesis and fixed orthodontic appliances. This may lead to more inflammation and further plaque accumulation perpetuating this vicious cycle. Thus, there is a transformation of the gingival sulcus into a periodontal pocket creating an area where plaque removal becomes impossible.The usage of electrosurgery has increased during the past three decades as a result of a significant rise in minimally invasive and microvascular surgery. Electrocautery provides excellent haemostasis during surgery but can lead to generation of excess heat leading to a thermal damage.The fibrotic component of gingival hyperplasia with a long-standing chronic characteristic requires surgical treatment.2 An electrosurgical unit can be used to perform gingivectomy. It ensures that the tissue is properly contoured. Utilizing electrosurgery also enables simple tissue incision with a potent hemostatic impact. When a patient has a cardiac pacemaker, it is not advised. Any contact to bone or cementum has to be avoided as it can cause irreparable damage. Needle electrode is used for removal of enlarged tissue. Festooning and shaping can be done using ovoid or diamond shaped electrode. Electrode is activated in concise shaving motion making brief contact with the tissues in cut phase. Prolonged contact will result in charring of tissue. To control bleeding during the coagulation phase, a ball electrode is employed. Electro Surgery has been used often in several areas of medicine, including dentistry, since 1914. The intentional application of high-frequency waveforms or currents to bodily tissues in order to produce a predictable surgical result is known as electro surgery. The father of electrosurgery is credited to be William T. Bovie.[3] The practitioner can utilise ES to cut or coagulate soft tissues by changing the way this type of current is applied. Many soft tissue surgical procedures that are currently carried out with lasers can be performed with an electrosurgical unit, which is far less expensive than a laser unit. Angulated electrodes suit clinical needs, cuts are performed easily when the device is set appropriately, cuts result in quick and consistent hemostasis, the wound was less painful, and the tip of the electrode is self-disinfecting. These are all advantages of electrocautery that have been acknowledged. Electrocautery has disadvantages such as the need for anaesthetic before cutting, the smell of burning flesh that cannot be avoided, the lack of tactile sensitivity, the risk of damaging bone in an explosive environment, the contraindication of using it on patients who have pacemakers, and the poor postoperative recovery.

CASE REPORT-

A 15 year-old male patient reported to the Department of Periodontics, Surendera Dental College and Research Institute, Rajasthan University with a chief complaint of swollen bleeding

gums and bad breath for few months. He complained of swelling of the lower gums with bleeding. (Fig. 1)

After a thorough dental and medical history was taken, it was determined that the patient had poor oral hygiene maintenance, with plaque and calculus buildup, while being deemed to be generally healthy and not taking any medications. The initial course of treatment comprised oral prophylaxis, which intended to completely remove all calculus above and below the gingiva in order to reduce irritation. Following scaling, the patient received oral hygiene instructions. He was instructed to use mouthwash containing chlorhexidine digluconate twice daily for 14 days.

On the follow-up visit, the initial inflammation had gone but the fibrous gingival enlargement had persisted. The procedure was done in the maxillary and mandibular anterior region. After giving local anaesthesia ovoid loop electrode was used for festooning the anterior region. With the help pf pocket marker the extension of location of the base of the pocket in relation to mucogingival junction was marked. (Fig. 2) Utilizing electrosurgery, gingival overgrowth was removed. A blended cutting and coagulating current was used. The foot control, changeable electric power setting, passive electrode, active electrode handle, and attachment make up the electrosurgery unit. After removing the gingival tissue with a needle electrode, a ball tip electrode was used to control bleeding. (Fig. 3) The patient was given antibiotics and analgesics and was advised to follow up after 15 days. (Fig. 4) Patient was comfortable and areas were healed. There was generalized loss of stippling and the surface appeared smooth and glossy and the generalized periodontal pocket depth of 4-5mm was present. (Fig. 5) Consistency was soft and edematous and the width of the attached gingiva was adequate.

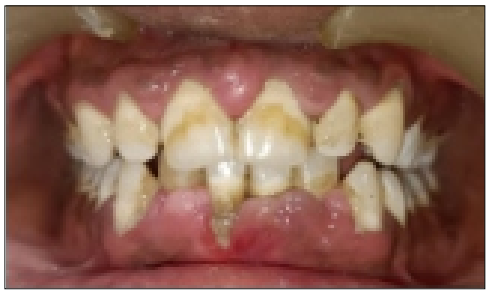

Fig. 1 Pre- Operative (before scaling)

Fig. 2 Periodontal pocket marked

Fig. 3 Immediate Post-Operative

Fig. 4 Immediate Post-Operative

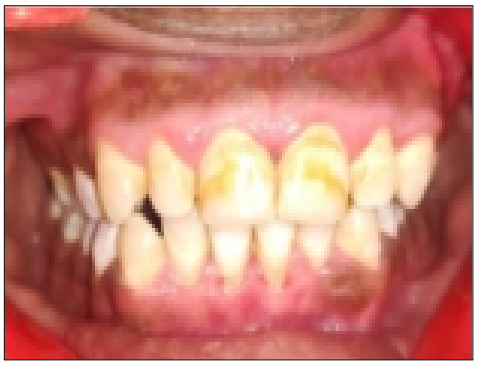

Fig. 5 1 Month Follow Up

DISCUSSION-

Poor oral hygiene is an important risk factor for drug-induced gingival overgrowth. Gingival hyperplasia may be caused due to several etiologies such as drug induced enlargement due to (Cyclosporin, phenytoin, nifedipine), hereditary, puberty induced, pregnancy induced, inflammatory component and systemic involvement such as (leukemia, neurofibromatosis).[4] The therapeutic approaches related to gingival enlargement are based on the underlying etiology and the subsequent changes it manifests on the tissues. The prime treatment modalities involve obtaining a detailed medical history and nonsurgical periodontal therapy, followed by surgical excision to retain esthetical, and Poor oral hygiene is an important risk factor for drug-induced gingival overgrowth periodontal therapy, followed by surgical excision to retain esthetical, and functional demand.

Electrosurgery is the intentional passage of high frequency waveforms or currents, through the tissues of the body to achieve a controllable surgical effect. By varying the mode of application it can be used for cutting or coagulating soft tissues. It has the advantage of adequate contouring of the tissue, controls hemorrhage and patients experience less post-operative pain after the procedure.

The therapeutic objectives desired in restorative dentistry include incision (or excision) and coagulation of tissue. Both monopolar and bipolar modes can achieve cutting and coagulation of tissue. The monopolar mode, however, is more effective than bipolar for cutting action and possesses distinct advantages over the bipolar mode for this objective. A wide variety of electrode shapes is available for monopolar cutting than is available in the bipolar mode. Although cutting can be accomplished by the bipolar mode, it is much more inefficient and restrictive in application. Electrosurgery has always had serious limitations in the oral cavity. Some problems included its inability to touch bone or metal, high heat and current spread, the need for a grounding pad, and the fact that it cuts by promoting spark. These limitations have limited its acceptance by many general dentists and almost a complete avoidance by periodontists and oral surgeons. Regular users of Electrosurgery know from experience, that when Electrosurgery is applied according to principles, predictable and good wound healing can be achieved.

Plaque induced gingival hyperplasia usually begins at gingival margin and shows change in color and contour. Consequently, the sulcular temperature changes too and the quantity of gingival exudate is increased. The gingival bleeds on slight provocation.

Drug-induced gingival enlargement presents as abnormal growth of the gingiva due to an adverse drug reaction in patients treated with anticonvulsants, immunosuppressants, and calcium channel blockers. Drugs causing gingival enlargement include calcium channel blockers like Amlodipine, Diltiazem, Felodipine, Isradipine, Nicardipine, Nifedipine, Nisoldipine, Verapamil, Manidipine, immunosuppressants like tacrolimus and cyclosporines, anticonvulsants like phenobar-bitone, primidone, and valproic acid.[5] Plaque induced gingival enlargement case shows poor oral hygiene as there was more of inflammatory component and there was drastic reduction in enlargement after scaling and root planing and curettage, and the residual was corrected by gingivectomy surgery. Thus, understanding cause and pathogenesis and planning treatment based on it is important.

Recurrence after treatment is a most common problem. Recurrence of Chronic gingival enlargement: (a) After treatment immediately - incomplete removal of irritants, (b) after healing - inadequate plaque control by the patient most common cause. One of the most important determinants of treatment outcomes is patient compliance. The willingness to perform adequate oral hygiene measures and receive periodic recalls and treatment is essential for a successful outcome.[6] Electrosurgery has several applications in almost all branches of dentistry, but this technique is not very widely used. Electrosurgery can never completely replace the scalpel but although Electrosurgery requires more

knowledge and skill, the advantages is less and outweighs its disadvantages. If the clinician practices Electrosurgery techniques in the laboratory and applies them clinically according to the principles, clinician will surely find ES to be of immense use in clinical dentistry. This report helps to highlight the importance of patient motivation and patient compliance in treatment planning.

CONCLUSION-

Successful treatment of gingival enlargement depends on the proper identification and elimination of etiologic factors and proper maintenance. Oral hygiene education supplemented with positive motivation should be started at the initial stages. At each recall visit, the patient should be notified about their ongoing dental condition and the effects of risk factors like poor oral hygiene and deleterious habits on the existing oral state.

Electrosurgery can be used as an alternative to conventional surgery. Successful results can be obtained with careful usage and having proper knowledge. Although this surgery in utilization has resulted in new applications, equipment features, problems and solutions, the use of electrosurgery in the field of dentistry has remained relatively unchanged. For the management of such cases, regular professional oral prophylaxis and patients compliance is necessary. Oral hygiene education supplemented with positive motivation should be started at the initial stages of the treatment strategy to obtain predictable outcomes.

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Case Report

RECONSTRUCTION OF NON FUNCTIONAL CUSP USING COMPOSITE RESTORATION WITH TEMPLATE METHOD: - A CASE REPORT

Dr. Amandeep Kaur, Dr. Neetu Jindal, Dr. Renu Aggarwal Dr. Monika Choudhary

ABSTRACT

The aim of this clinical report is to present a possible alternative treatment, with 24-month follow-up, for restoring tooth loss due to caries. A 38 year old male patient complaining of food lodgement in lower left back tooth region. The planned treatment was to perform restoration with composite material, aiming to restore the dental anatomy. A silicone guide, obtained from a diagnostic waxing, was used during the restorative approach considering the patients occlusion. During monthly recalls up to 24 months, the treatment was stable and in service. In addition, the patient reported no pain and improved chewing, leading to better quality of life.

Keywords: - Composite resin, silicone guide, vacuum formed matrix template

INTRODUCTION

Composite resin materials represent a well-investigated and established material group for restoration of posterior teeth.[1] Therapy focuses primarily on the reconstruction of lost tooth structure while providing good long-term stability, function and aesthetics.[2] Thereby most importantly, adequate diagnosis, prevention and maintenance are inevitable aspects of a synoptic treatment approach.[3] Traditionally reconstructive concepts mainly include methods like porcelain-fused-to-metal crowns or ceramic overlays. This treatment is not only invasive, but also time-consuming and expensive. Especially in countries with self-pay patients less expensive treatment modalities would be of great interest and direct composite restorations would lend themselves for a valuable restorative option. The use of directly applied resin composite to restore worn teeth was first described by Bevenius and coworkers.[3]

Already in 1994, they realized that composites are unique aesthetically pleasing materials allowing relatively economical and non-invasive techniques. This limited interest and acceptance of such an approach are mainly based on the fact that the required freehand build-up technique is time-consuming and clinically demanding.[4] The literature does also suggest that failure rates are higher for larger restorations, and that wear may still be a significant problem.[5] In addition, there might also be a concern that possible interferences or complications with the gnathologic system may be provoked due to a potentially unbalanced occlusion.[6] An approach to solve this problem is the use of vacuum-formed matrix template, which is fabricated based on wax-up models, to shape the directly applied resin composite, thus avoiding demanding freehand build-ups.[7]

The purpose of this study is to present clinical case including reconstruction of non functional cusp using composite restoration with template method with 24-month follow up.

CASE REPORT:-

A 38 year old male patient reported to the department of Conservative Dentistry and Endodontics with the chief complaint of food lodgement in lower left back tooth region since I month.

On intraoral examination, there was carious lesion especially on the disto lingual cusp i.e. 47(fig 1).

Fig 1: preoperative view

Vitality tests showed normal response to cold and heat stimuli. Radiographic examination revealed caries on the distal aspect of 47 involving the dentin (fig 2).

Fig 2: IOPA wrt 47

Thus the final clinical diagnosis of Asymptomatic reversible pulpitis i.r.t. 47 was made. In order to address the reported pain

symptoms and to restore the dental anatomy, the restorative treatment was planned. So composite restoration was advised to the patient to restore tooth's form and function, because of caries involvement in distolingual cusp which is non functional in nature.

PROCEDURE:

Complete oral prophylaxis was performed before the starting of restorative treatment. Impressions of both arches with irreversible hydrocolloid (Avagel, Dentsply, Rio de Janeiro, Brazil) were made. After being disinfected, the mold was poured with plaster stone. The waxup of diagnostic cast was done and a vacuum-formed matrix template was fabricated (fig 3).

Fig 3 waxup done and matrix template fabricated on diagnostic cast

The margins of the template, close to the gingival area, were trimmed for material excess removal during the material setting. Cotton roll isolation was performed, thereafter, the template was proofed to fit accurately. The hollow space of the template represented the future composite material to build-up the tooth and copy the wax-up. The template was removed and the enamel was etched for 30 seconds with 35% phosphoric acid (Ultraetch, Ultradent, South Jordan,USA) and Bonding agent (Syntac, Ivoclar Vivadent, Schaan, Liechtenstein) was applied (fig 4).

Fig 4: Etching and bonding done wrt 47

The template was insulated (Insulating Gel, Haereaus Kulzer, Hanau, Germany) and the restorative micro hybrid composite resin material was filled in the template (Tetric Ceram, Ivoclar Vivadent). The latter was the repositioned on the tooth arch. The composite resin material was light-cured (Optilux 500, Demetron Inc., Danburry, USA) for 3-4 seconds to freeze material. The template was carefully removed and an excess material was removed. Thereafter, the material was cured for 60 seconds and gross Finishing and polishing were done using the composite polishing kit (Shofu Inc, Kyoto Japan) to achieve pleasing results.

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Post operative view

DISCUSSION:

However, according to the concepts of Conservative dentistry, factors such as patient's age and the need for tooth structure preparation should be considered. Following this idea, the main objective is to preserve as much dental structure as possible using techniques that allow less or no preparation of the damaged tooth. Direct resin composite restorations might not require tooth preparation, which allows a maximum preservation of tooth structure and leads to less cost and time for their construction. Composite restorations are highly favoured by the treating dentist because of the varieties of shade available, easy adaptability, good strength and longer life.8 However, there are many disadvantages like technique sensitive, polymerization shrinkage, inadequate dry area to work causing failure and inadequate light curing (time and depth) being some of them. Posterior teeth with primary carious lesions may present an intact occlusal morphology.[7] with little or no damage to the enamel, there is destruction of the dentin. To reach the infected dentin, a sufficient amount of healthy enamel has to be removed. In this lies the concept of using a template before the operative procedure for such kind of initial lesion. The reduced overall time due to almost instantly desired good cusp–fossa relationship is the major advantage of this technique.

As the stamp exerts pressure on the composite, there is reduction of porosity in final restoration along with decrease in the formation of microbubbles and interference of oxygen during polymerization of composite.[8,9] With the minimal time required for finishing to obtain a good fossa–cusp relationship with the opposing dentition, template technique is suitable in a busy practice dealing with many patients. It is advantageous because less time is required to recreate occlusal anatomy, material consumption is less, decreased chairside time, replicates original occlusal anatomy, and no need of special instruments.[9] Other cost-effective materials could be considered as follows: pit and fissure sealants, poly methyl methaacrylate, pattern resin, gingival dam material and bite registration material. Additional studies, however, with more patients and longer evaluation periods are needed to help confirm the positive clinical performance reported in this study in the longterm.

CONCLUSION :

The template technique provides an easy approach to restore with accurate topography, less post fill adjustments, and less time. The accuracy of topography replication is greater than the manual method and can be adapted to unconventional cavities as well.

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Review

BEYOND THE BOUNDARIES : ROBOTICS IN PROSTHODONTICS – A REVIEW

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ABSTRACT

Dental professionals may experience physical and mental exhaustion after hours of demanding procedures in ergonomically challenging positions, potentially leading to mistakes in the oral examination, disease diagnosis, and treatment planning. There is also a risk of general carelessness surrounding daily routine works, such as cleaning of instruments and surfaces in the dental clinic.

Digital dentistry compatible with robotics can help to minimize errors and enhance the overall quality and quantity of patient care.

Robotic interventions in prosthodontics are mainly for designing and manufacturing of complete dentures and for assisting in dental implantology surgical procedures. Apart from serving as dental assistants, robots in conjunction with 3D navigation can be used for invasive dental procedures, including tooth preparation and autonomous dental implant placement.

KEYWORDS:

Prosthodontics, robotics, dental implants, prosthetic dentistry, robots, teeth arrangement

INTRODUCTION

Robot can not only increase the productivity of the workers, taking the place of human to do the repeated, boring, and dangerous work, but also accomplish some work where human is not competent. Therefore, robot is paid much attention and widely used increasingly. Since the 1990s, the application of robot is gradually extended from the traditional industrial areas to families and medical and other fields. In 1994, the First International Symposium on Medical Robotics and Computer Assisted Surgery is held in Pittsburgh Pennsylvania, USA. Thus, in many developed countries, such as the United States, Italy, Japan, and other countries, the government and academia focus on the development of medical robot system and deploy plenty of manpower and financial resources on the research field. In the past few years, the production value of electronic medical devices, developed on the basis of medical robots system, is growing at 10 percent a year. The governments of the countries around the world not only hope that the research of medical robot system brings convenience to the treatment of diseases and produces good social effects. They also hope it can generate a new economic growth point and bring better economic benefit.[1]

Prosthodontics has incessantly evolved and has shown itself capable of evolution in response to dynamic wants. Emergence of newer concepts, technologies, materials have an impact on the education, research, and practice of prosthetic dentistry. Introduction of robots in prosthetic dentistry was one such event. Since the 1990s, after the developments in industrial robot technology, the application of robot has been gradually extended to different fields including medical and dentistry. In 1994, the First International Symposium on Medical Robotics and Computer Assisted Surgery was held in Pittsburgh Pennsylvania, USA.

The term “robot” was coined by Playright Karel Capek in 1921 in his play Rossom’s Universal Robots. The word robot comes from the Czech word ‘robota’ which means forced labor. Robotics is an interdisciplinary branch of engineering and science. According to the robot institute of America a robot is defined as “a reprogrammable, multifunctional manipulator designed to move materials, parts, tools or specialized devices through various programmed motions for the performance of a variety of tasks”. The utilization of robots in the field of prosthetic dentistry might facilitate to extend the productivity of the staff, and may help to prevent the humans from doing some recurrent, boring, and dangerous work. Therefore, this robotic technology is paid abundant attention and its uses are progressively increasing on day-to-day basis.[2]

II. VARIOUS APPLICATIONS OF ROBOTICS

A. TOOTH ARRANGEMENT ROBOT FOR COMPLETE DENTURES

The traditional way of complete denture manufacturing is manual, and the key step of the procedure is to implant artificial

teeth into a tooth pad in their correct positions and orientations. Only speciality dentists and skilled technicians can do this work well. This traditional approach is now replaced with the use of robots to manufacture denture systems. Complete dentures vary considerably in tooth size, the relative position and orientation of each tooth, and the shape of the teeth arch curve. The advantage of a robot is its operational flexibility, and can be adapted for handling the manufacture of complete dentures. CRS Robotics Corporation, Canada, produced a single manipulator robotic system with 6 DOFs. This system was then adapted for the manufacture of complete dentures. The main components of the system are (1) CRS robot, (2) electromagnetic gripper, (3) a computer, (4) a central control system with tooth-arrangement and robot control software for tooth-arrangement, motion planning and control, (5) denture base, (6) light source device, and (7) light-sensitive glue as shown in Figure 1.[3]

Fig. 1 - Robotic arm of the typical CRS robot system 3

The three dimensional virtual tooth-arrangement software of the robotic system helps to create medical history files of a patient, draw a jaw arch and dental arch curves by expert's experience according to the jaw arch parameters of the patient, and adjust the dental arch curve. It then display the three dimensional virtual dentitions on the screen, provide a virtual observation environment for designed dentitions, and interactively modify each tooth posture. The calibration of the tooth arrangement, initial positioning of the robot, creating control data for tooth arrangement and the overall control of the robot are done by the robot control software. However it was found that the system had difficulty in grasping and manipulating the artificial teeth accurately. This led to the development of more improved robotic systems with more number of DOFs. Further research led to the design of an advanced 84 DOF system with 14 independent tooth manipulators on the dental arch curve. In order to adjust the tooth's position on the dental arch, the manipulators were designed to move along its tail in both directions. There was a tooth arrangement helper in the system with 6 DOFs (three rotations and three movements) to adjust the tooth for its position along X, Y, Z, lingual, rotation and near-far-medium directions. This robotic system is able to realize any posture in the artificial teeth space, and solved many problems of the single robotic system. But one major disadvantage of this system is that it is driven by 84 independent motors and hence difficult to control it which reduced the efficiency. A much improved 50 DOF tooth arrangement robotic system was then designed with 14 independent manipulators, a dental arch generator and a slipway mechanism as its components. Dental arch generator create the dental arch curve and matches with the one from the patient's oral cavity as demonstrated in Figure 2. [3]

Fig. 2 - Complete denture made by the 50DOF multi manipulator tooth-arrangement robot system. 1

A. DENTAL IMPLANTOLOGY ROBOT

Applications of computer assisted pre-operative procedures like CAD/CAM are followed in dental implantology for long. But the use of robots for the surgical procedure is relatively new. Applications of robots for the implant surgical procedure was a research theme in many of the research and medical centres over the recent period. They are considered as a step forward in utilizing the applications of computer assisted pre surgical

planning to the usage of robots in the surgical phase. Several prototype systems were developed in many centres like University of Kentucky, Ecole des Mines de Paris, Umea Universitet, University of Coimbra and University of Duesseldorf. The general features of these systems were a robotic arm with drilling tools, a data acquisition board, strain gauges for stress/strain evaluation, and a force/torque sensor (equipped with accelerometers) placed on the robot wrist. The optimal number of implants and their placement/orientation is studied through the implant force, and the stress/strain analysis of jaw bone tissue with the different drilling posture. The first commercially available and state of the art robotic system for dental implantology, named as Yomi was developed by Neocis Inc, USA and approved by FDA in 2017. Yomi is a computerized navigational system intended to provide assistance in both the planning (pre-operative) and the surgical (intra-operative) phases of dental implantation surgery. The system provides software to preoperatively plan dental implantation procedures and provides navigational guidance of the surgical instruments. Yomi delivers physical guidance through the use of haptic robotic technology, which constrains the drill in position, orientation, and depth as seen in Figure 3. 3

Fig. 3 - Yomi dental implantology robotic system 3

B. TOOTH PREPARATION ROBOTS

Tooth preparation for crown and bridge is routine work, but it is still challenging even after years of clinical experience. The primary challenge is to decrease the tooth sufficiently to make space while applying the least possible harm to healthy tooth substance. For clinicians, the concept of a robotic system utilized for tooth preparation appears sensible and tempting. An in vitro testing of a mechatronic system has been conducted to aid the clinician in tooth drilling. The report demonstrated good outcomes, however, its validation has not been performed so far in the clinical setup. With a mechatronic system, the accuracy of the clinician's position was 53% more efficient than without it. A tooth preparation robotic system was presented by Yuan and colleagues, which consisted of the following hardware parts: (a) a tooth fixture that connects the target tooth with the robotic tool and safeguards the adjoining tooth from laser-cutting; (b) a 6-DOF robotic arm; (c) an efficient low-heat laser appropriate for the preparation of hard tissue; (d) a CAD/CAM software to generate a 3D motion path of the laser and to design the target shape for tooth preparation; and (e) an intraoral 3D scanning machine for obtaining the 3D information of the subject's teeth fixture, opposing teeth, adjoining teeth, and the target tooth.[4]

III. ADVANTAGES AND DISADVANTAGES

Dental robots have several advantages and disadvantages.

They are

A. ADVANTAGES

· Extremely high accuracy and precision

· Stable and untiring, and hence can be used repeatedly without rest

· Able to accurately process and judge quantitative information fed into the system

B. DISADVANTAGES

· No judgment of the situation and hence unable to use any qualitative information

· Continuous monitoring of an experienced dentist is always required these devices still remain very expensive and out of reach of the common man.[3]

IV. CONCLUSIONS

The intervention of robotics in the field of prosthetic dentistry is no longer fictional but it is still at the stage of infancy. In this era of expeditiously growing ideas and technologies, quality research is required to maximise the use of this magnificent innovation. The use of robotic systems for providing the prosthetic treatment can improve the accuracy as well as the precision of the treatment

provided under the supervision of expert clinicians. However, these artificial intelligence cannot obviate the veteran dentist for their expert skills and judgements. Also the patients will be needed to indoctrinate toward the acceptance of this technology along with clinicians for the betterment of mankind. The use of this artificial intelligence in the assorted field of prosthetic dentistry will be a topic of intense discussion in the near future and will be a common reality in a matter of time. [2]

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Review

CEPHALOMETRIC NORMS FOR HIMACHALI CHILDREN USING STEINER'S ANALYSIS

Dr. Azhar Hashmi, Dr Bisma, Dr Insha Rasool

INTRODUCTION

Clinical orthodontics requires an understanding of dental development and also concepts about physical growth[1]. Human growth involves physical, mental, psychological, social & moral development.

Clinical and interceptive orthodontics require a thorough knowledge of dental development and also concepts regarding growth and development of an indvidual. Human growth involves physical, mental, psychological and moral development.

Growth studies are usually done so as to assess health and nutrition of children and to study divertsity. Rather than categorizing people as normal or abnormal, it is more useful to think in terms of deviations from usual patterns and to express variability quantitatively. Cephalometrics play a major role in studying human skull as it abstracts human skull into a geometric scheme.[2] Cephalogram helps us to assess craniofacial growth and development and to further diagnose malocclusion whether skeletal or dental malocclusions.[3] To diagnose and classify a malocclusion, the measured values of cephalometric parameters are compared with standard values.

Steiner CC (1953) published a method of interpreting both the hard and soft tissues using cephalometric radiographs.[4] The craniofacial features both skeletal as well as dental are either genetically in origin; nutritionally acquired or dietary patterns acquired from parents and are specific to some ethnic, racial, subracial as well as from different community groups.

In this study we have taken cephalograms of Himachali children visiting our department and compared there values using Steiner's analysis with the values/norms given by Steiner for Caucasian population.

AIMS AND OBJECTIVES

1. To determine cephalometric norms for Himachali children between the age group of 11 and 13 years using Steiner's analysis
2. To compare their values using Steiner's analysis with the values given by Steiner for Caucasian population.

MATERIAL AND METHODS

This cephalometric radiographic study was carried out in the Department of Pedodontics and Preventive Dentistry Himachal Dental College and Hospital Sundernagar Himachal Pradesh.

A total of 100 children, with equal male and female ratio, between the age group of 11 and 13 years were taken for the study.

Inclusion criteria:

- Subjects with Angle's class I occlusion
- Normal overjet and overbite
- No crossbite
- Competent lips

No history of maxillofacial trauma or cleft lip or palate

Radiographic technique:

The lateral cephalogram of the subjects were taken, with the ear rods and the nasion pointer of the cephalostat in position in order to stabilize the patients's head and avoid excess motion .

X-RAY FILM SPECIFICATION:

The film used were Kodak X-ray films of size 8 inches × 10 inches for lateral cephalograms having source to film distance of 5 feet and assessed with a radiographic illuminator to ensure contrast enhancement of teeth and bony images.

All the radiographs were traced on a standard matte acetate tracing paper in a random order. Each landmark and point was rechecked and then Steiner's analysis was done

Fig. 1. Pt. Positining for lateral cephalogram

Fig. 2. Aram measurement for lateral cephalogram

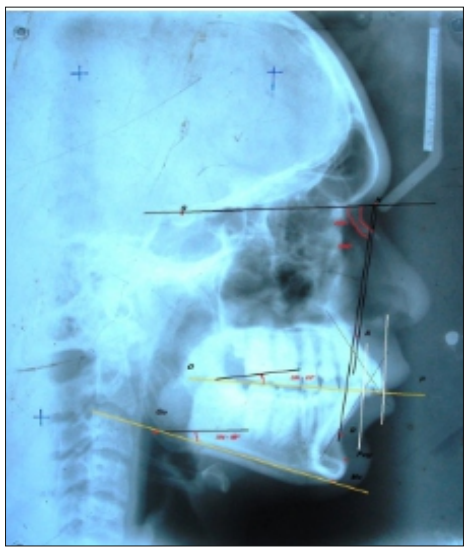

Fig. 3. Landmarks trand and analysis done on lateral cephalogram

METHOD ERROR:

All measurements on the lateral cephalograms were made twice by the same examiner to minimize the error of measurements. Assessment of the intra-examiner reliability analysis was performed using Kappa statistics. The intra-examiner reliability was found to be Kappa= 0.80-1.00 ($p < 0.001$) which shows perfect agreement according to Landis and Koch (1997). All the measurements were obtained and statisticaly analysed.

RESULTS

The results obtained were analyzed using SPSS (Statistical Package for Social Sciences) software version [18]. The mean value and standard deviation of each measurement were calculated (Table 1). Student t-test was used to compare measurements of Himachali children with measurements given by Steiner (Table 2).

(Table 1)

Parameters	Min	Max	Mean	SD
SNA	75°	86°	80.09°	2.65 °
SNB	72°	84°	78.14°	2.27 °
ANB	1°	5°	3.44°	1.40 °
Occlusal angle	15°	23°	19.10°	1.32 °
Mandibular plane angle	22°	36°	30.34°	1.43 °
Upper incisor to NA(angular)	16°	33°	31.20°	4.58 °
Upper incisor to NA (Linear)	1mm	7mm	4.23	2.44
Lower incisor to NB(Angular)	18°	36°	28.56°	4.25 °
Lower incisor to NB (Linear)	1mm	10mm	4.58	2.01
Interincisal angle	104°	134°	119.34°	6.88 °

Comparison of cephalometric variables between Himachali children and Caucasian children

(Table 2)

Parameters	t-value	p- value
SNA	-2.89	0.0348*
SNB	-3.56	0.044*
ANB	5.44	0.047*
OCCLUSAL ANGLE	31.76	0.078
MANDIBULAR PLANE ANGLE	13.59	0.88
Upper incisor to NA(angular)	4.41	0.039
Upper incisor to NA (Linear)	3.56	0.022
Lower incisor to NB(Angular)	7.80	0.039
Lower incisor to NB (Linear)	6.63	0.029
Interincisal angle	6.67	0.019

DISCUSSSION :

In this study we have evaluated cephalometric norms for Himachali children using steiners analysis and compared them with the Caucasian children.

Our study showed that the value of SNA angle is(80.09 ± 2.65) , which is less as compared to Steiners value indicating maxillary

retrusion to cranial base as compared to Caucasian children which is in accordance to study conduted by Chandranee et al .[5] The value of SNB in our study is (78.14±2.27) , which is less as compared to values given by Steiner and shows mandible is retrusive in Himachali children as compared to Caucasian which is in accordance to study conducted by Kharbanda et al6 (SNB-78.52°).

Occlusal plane values(19.10+1.23) in our study are higher as compared to values given by steiner indicating Himachali children have anteriorly placed occlusal plane and it was supported by the conducted by Anuradha et al[7] (occlusal angle-21.7°) which is greater than those presented by Steiner

The value of mandibular plane angle was (30.34 + 1.43) which is slightly less as compared to values given by Steiner indicating Caucasian children have more vertical growth pattern as conmapred to Himachali children and it was in accordance to study conducted by Kannappan et al8 (mandibular plane angle–31.0°), where mandibular plane angle was lesser than the value given by Steiner

The upper incisor to NA values in our study angular (31.20+4.58) and linear (4.23 + 2.44) these values indicated the protrusion and proclination of upper incisors as relative to NA and in our study the values were largers as compared to Caucasian population. This was in accordance to the study conducted by Chandranee et al [5] (1982) on North Indian children where both the angular and linear measurements were more as compared to those given by Steiner

Lower incisor to NB values in our study were (28.56 + 4.25) angular and linear values are (4.58 + 2.01) and in our study the values were more as compared to the Caucasian population given by Steiners indicating Himachali children were having more labially placed mandibular teeth and it was in accordance to the study conducted by Chandranee et al [5]

Interincisal angle values (119.34 + 6.88) in our study were less as compared to values given by Steiner indicating more proclined maxillary and mandibular teeth which is in accordance to the study conducted by Nanda et al.[7]

CONCLUSION:

From our study we concluded that Himachali children have retrusive mandible and proclined maxillary and mandibular teeth and the occlusal plane was placed more anteriorly.

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Review

SLEEPLESS NIGHTS: WONDERING IF WE ARE ALIVE!!!

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ABSTRACT-

Sleep apnea syndrome is a relatively common and potentially life-threatening disorder. Heightened public awareness, more frequent recognition by health care providers, and sophistication in diagnostic instrumentation, have led to a dramatic increase in the number of diagnosed patients. The increasing demand for non-invasive treatment modalities, including intraoral prostheses, should motivate dentists to become more aware and knowledgeable of this disabling syndrome. This paper includes its etiology, signs and symptoms as well as treatment modalities.

KEYWORDS- Obstructive sleep apnoea, sleep apnoea

INTRODUCTION

Sleep apnoea syndrome is a relatively common and potentially life-threatening disorder. The sleep apnoea syndrome, first described by Gastaut, is a disorder associated with repetitive cessation of breathing during sleep[1]. Obstructive sleep apnoea (OSA) is a prevalent disorder particularly among middle-aged, obese men, although its existence in women, as well as in lean individuals, is increasingly recognized. Four percent of adult men and 2% of adult women in general population random samples meet the current clinical and polysomnographic criteria for the diagnosis of sleep apnoea warranting immediate therapeutic intervention[2].

Obstructive sleep apnoea-hypopnea syndrome (OSAHS) is characterized by repetitive episodes of airflow reduction due to pharyngeal narrowing, leading to acute gas exchange abnormalities and sleep fragmentation and resulting in neurobehavioral and cardiovascular consequences. During sleep, critical narrowing of the upper airway occurs behind the uvula and soft palate, at the base of the tongue, or at both sites; it develops because of a dysfunctional interplay of anatomical factors and compensatory neuromuscular mechanisms insufficient to maintain airway patency. Obstructive sleep apnoea-hypopnea syndrome may be considered part of a spectrum of sleep related breathing disorders that includes the upper airway resistance syndrome (UARS) and primary snoring[3].

APNOEA-HYPOPNEA INDEX (AHI)

An apnoea is defined as cessation of airflow for 10 or more seconds. It usually indicates complete obstruction of the upper airway. A hypopnea is commonly defined as at least 30% reduction in airflow for 10 seconds associated with a 4% decrease in oxygen saturation. It connotes a transient reduction in inspiratory airflow caused by increased upper airway resistance. An apnoea is considered obstructive if there is continued respiratory effort despite cessation of airflow. An apnoea is considered to be of central origin if there is no concurrent respiratory effort. OSA severity AHI < 5 Normal or primary snoring The apnoea-hypopnea index (AHI) is the average number of disordered breathing events per hour. OSA is defined by the presence of at least 5 obstructive apnoeas, hypopneas, or both per hour while the patient is sleeping. OSA is commonly divided into 3 levels of severity: mild (AHI = ≥5 but <15 events per hour); moderate (AHI = 15-30 events per hour); and severe (AHI = >30 events per hour)[4].

ETIOLOGY

The pathogenesis of sleep disordered breathing involves an interaction between unfavourable pharyngeal anatomy and ventilatory control instability. Obstructive sleep apnoea is due to anatomic factors that promote pharyngeal narrowing including large neck circumference, cervical soft tissue,vessels, and bony structures. Many of these factors promote pharyngeal collapsibility by decreasing the caliber of the upper airway or by increasing the upper airway surrounding pressure. Increased upper airway collapsibility during sleep has been linked to structural changes in the surrounding bony and soft tissues, which is best measured by determining the critical collapsing pressure or compliance under inhibited neuromuscular activity[5]

Obesity is an important risk factor for obstructive sleep apnoea (OSA).The prevalence of OSA among obese individuals is high and correlates with increasing body mass index (BMI). Among the

severely obese, the prevalence of OSA ranges from 55% to 100%.In addition, obese individuals often have more severe disease as manifested by a higher apnoea-hypopnea index (AHI) and lower nadir on nocturnal pulse oximetry[1].

SIGNS AND SYMPTOMS

Common nocturnal symptoms

Snoring Witnessed apnoeas

Nocturnal choking

Nocturnal snorting and gasping

Restlessness Dyspnea

Diaphoresis Nocturia

Dry mouth

Drooling

Gastroesophageal reflux

Common daytime symptoms

Daytime sleepiness and fatigue

Morning or nocturnal headaches

Impaired memory and concentration

Decreased dexterity

Personality changes

Irritability Aggressiveness

Depression

Anxiety

Decreased libido

Impotence

DIAGNOSIS

HISTORY

Frequent awakenings

Difficulty falling asleep

Unrefreshing sleep

Daytime sleepiness

Attention, concentration, memory impairment

Mood disturbances

Reduced motivation, energy

Morning headaches

Excessive nocturia

PHYSICAL EXAMINATION

Obese

Large neck (neck circumference >42cm in men, >37cm in women)

Retrognathia, micrognathia

Crowded airway

Enlarged tonsil

High arched palate

Nasal deformities

COMORBID CONDITIONS

Resistant hypertension

Recurrent atrial fibrillation

Stroke

Myocardial infarction

Pulmonary hypertension

Chronic heart failure 6

INVESTIGATIONS

The gold standard for diagnosis of OSA is polysymnogram which includes electroencephalographic, electro-oculographic, electromyographic, oxygen saturation, oral and nasal airflow, respiratory effort, electrocardiographic, and leg movement recordings. A full-night polysomnogram usually provides an accurate picture of sleep characteristics and the severity of OSA.

Lateral cephalograms are used to analyze skeletal and soft tissue characteristics of patients with OSA. Compared to lateral X-ray cephalometry, CT scanning and MRI significantly improves soft tissue contrast and allows precise measurements of cross-sectional areas at different levels, as well as three-dimensional reconstruction and volumetric assessment. CT scanning has provided valuable insights into the pathophysiology of Sleep Disordered Breathing and plays a major role in its management. Acoustic reflection test can be used to determine the airway obstruction and also the corresponding effect of mandibular

advancement and protrusion on the upper airway. In this test, the sound wave is projected into the airway and is reflected back through the tube to a computer which creates graph that determines the location of the obstruction.

Spirometry is a pulmonary function test. It is a simple method of studying pulmonary ventilation by recording movements of air into and out of lungs. The test determines the inspiratory flow rate, expiratory flow rate, forced vital capacity (FVC), ratio of forced expiratory volume in 1 s to FVC, and other ventilation rates.[7]

TREATMENT

The treatment of OSA can be considered under lifestyle modifications, CPAP therapy, oral devices and surgical treatment.

Lifestyle modifications

This includes encouraging patients to lose weight, avoid sleep deprivation, and refrain from tobacco, alcohol, and

sedatives. The relationship between weight loss and apnoeas is apparently curvilinear. A critical amount of weight loss must often occur before a significant reduction in AHI is seen. Weight loss alone does not cure OSA in the majority of patients

CPAP THERAPY

Nasal CPAP therapy for OSA was first reported in 1981. Since then, it has become the most effective and widely used treatment for OSA. It treats apnoeas-hypopneas by providing air under positive pressure through a nasal or facial mask, thus creating a pneumatic splint in the pharynx, which prevents collapse of the pharyngeal airway.

Compliance rates of 65% to 90% have been reported in more recent literature. Pepin et al recently reported a compliance rate of 80% in response to augmented support for CPAP-treated patients with OSA. Rakotonanahary et al demonstrated that the addition of humidification to CPAP increased compliance and device use. Of 82 CPAP-treated patients enrolled in this study, 46 (56%) subsequently had nasal symptoms. A passive (cool) humidifier was added to their CPAP, despite which 23 patients had persistent nasal

symptoms and subsequently required heated humidification. With heated humidification, CPAP use increased from 3.5 hours to 5.38 hours daily. Only one patient discontinued CPAP after addition of heated humidification.

ORAL DEVICES

Most available oral devices are approved for snoring only. Only 14 devices have received clearance from the, US Food and Drug Administration for treatment of OSA. Of these, only 7 are adjustable, allowing titration of the mandibular position, and only 3 have undergone controlled or randomized clinical trials. These devices work on the principle of mechanically displacing the tongue or the jaw and tongue forward to increase space in the posterior

pharyngeal area. These devices should not be used for therapy of central sleep apnoea or in patients with temporomandibular joint disease or problematic nasal obstruction. Patients need to have sufficiently healthy teeth to anchor the device. Such devices are usually not recommended in patients with severe OSA or with significant nocturnal oxygen desaturation. Two recent trials have shown that even in patients with mild-to-moderate OSA, CPAP therapy produced better results, with greater improvement in AHI and sleepiness than observed with oral devices.

However, appliances can be categorized into-:

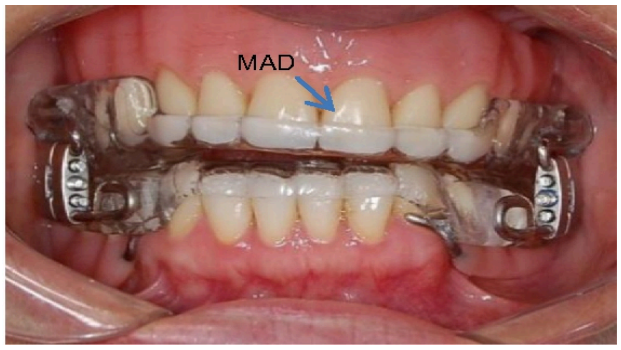
Soft palate lifting – the prosthesis lifts and/or stabilizes the soft palate, preventing vibration during sleep.

Tongue retention – tongue-retaining devices (TRDs) incorporate an anterior hollow bulb, which generates a negative pressure vacuum when the tongue is inserted. The tongue is held forward, away from the posterior pharyngeal wall, opening up the airway. Owing to muscle anatomy, this appliance simultaneously modifies the position of the mandible.

Mandibular repositioning – these appliances (MRAs) hold the mandible in an antero inferior position, which, as a consequence of muscle attachment, indirectly brings the tongue forward, opening up the posterior airway. It is vaccum formed appliance which is easy and cheap to construct.[8] The repositioning may also stretch and reduce the collapsibility of the soft palate via its connection to the base of the tongue and increase the superior

airway space.

Initial protrusive position is 75% of maximal protrusive position.



(Ref-Treatment of obstructive sleep apnea with mandibular advancement appliance over prostheses: A case report. Sleep Sci. 2015 Apr-Jun;8(2):103-6)

SURGICAL TREATMENT

Surgery can be carried out in at least 2 separate phases. Phase I surgery can include combinations of all the listed procedures, with the exception of maxillomandibular advancement. The reported short-term response rate to these procedures in combination is approximately 60%. If the patient does not respond, Phase II surgery can be considered, which consists of maxillomandibular advancement. These surgeries are best conducted in tertiary centers by experienced surgeons. In selected patients the success rate from combined Phase I and II surgery can be as high as 90%. The success rate is likely lower if the patient is obese with severe OSA and oxygen desaturation to less than 70%.[6]

Phase I	**Phase II**
Nasal septoplasty	Maxillomandibular
Turbinate reduction	Advancement
Tonsillectomy and adenoid resection	
Laser-assisted uvulopalatoplasty	
Uvulopalatopharyngoplasty	
Mandibular osteotomy with	
genioglossus advancement	
Hyoid myotomy-suspension	

CONCLUSION

Sleep and dreams are taken for granted by those not affected by obstructive sleep apnoea. Unfortunately in around 10 million population around the world, sleep is a nightly battle which leaves its victims and their bed partners fatigued, stressed and much less healthy. Untreated sleep apnoea is one of the major public health issues we face in common. The emergence of dental sleep medicine as a safe and effective treatment brings hope for the millions of patients looking for alternatives to CPAP treatment.[7]

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Review

METHODS OF ACCELERATING ORTHODONTIC TOOTH MOVEMENT: A REVIEW ON CHEMICAL AND BIOLOGICAL APPROACH.

Dr. Sorokhaibam Monika, Dr. Eenal Bhambri

ABSTRACT:

With the increasing plethora of adult patients who are seeking orthodontic treatment, emphasizing on enhancing the rate of tooth movement has increased. Unfortunately, long orthodontic treatment time poses several disadvantages like higher predisposition to caries, gingival recession, and root resorption. This increases the demand to find the best method to increase tooth movement with the least possible disadvantages. This article discusses the existing chemical and biological methods of enhancing tooth movement. Due to the advantages and disadvantages of each approach, further investigations should be done to determine the best method to accelerate tooth movement.

Keywords: accelerating orthodontic tooth movement (OTM), chemical methods, biological methods, orthodontics.

INTRODUCTION

It is generally accepted that the movement of the teeth with orthodontic forces depends on the bone remodeling rate, that are associated with the activity of inflammatory markers, quality and quantity of bone turnover, and the balance between osteoclastic and osteoblastic activity.[1] Osteoclastic activity is stimulated by changes in tooth-supporting tissue biomarkers of receptor activator of nuclear factor kappa-light-chain-enhancer of activated B cells (RANK), RANK ligand (RANKL), and osteoprotegerin (OPG) during tooth movement. RANKL is a membrane-residing protein on osteoblasts and their precursors, which recognizes its receptor RANK on macrophages, promoting them to assume the osteoclast phenotype.[2]

The force applied on the teeth will cause changes in the microenvironment around the PDL due to alterations of blood flow, leading to the secretion of different inflammatory mediators such as cytokines, growth factors, neurotransmitters, colony-stimulating factors, and arachidonic acid metabolites. As a result of these secretions, remodeling of the bone occurs.[3]

Many experimental and clinical studies have worked towards many approaches for shortening the duration of orthodontic treatment including chemical, biological, surgical, pharmaceutical, laser, electromagnetic, or other procedures. Regardless, none of these procedures have yet become a benchmark and an ideal solution to it.

Methods of accelerating tooth movement

There are three phases of tooth movement: the initial phase which is characterized by rapid movement after the application of force; followed by a lag period, where little or no movement, and the last phase, where gradual or sudden increase of movement occurs.

CHEMICAL APPROACH

EFFECT OF OSTEOCALCIN ON TOOTH MOVEMENT

Osteocalcin (OC) is the most abundant non-collagenous matrix protein in bone. Using this material to enhance the TM have been experimented by various scientists. It was found that pharmaceutical doses of OC had an additive effect on tooth movement .Since the effect was well correlated to the augmentation of osteoclasts on the alveolar bone in the pressure side, it was strongly suggested that the OC promoted the recruitment of osteoclasts into the local bone remodeling site.[3,4] In fact, OC has been shown to significantly enhance the formation of TRAP-positive multi-nuclear osteoclast-like cells in the presence of macrophage colony-stimulation factor (M-CSF) and granulocyte-macrophage colony stimulating factor using the in-vitro murine bone marrow culture system, but not in the absence of these factors (Liggett et al). [5]

EFFECTS OF DIAZEPAM

Increased levels of cAMP in the areas of bone resorption during orthodontic tooth movement have been suggested as correlates of cellular activity. Diazepam has been shown to increase the levels of cAMP in rat brain, cat heart muscle, and central nervous system cells by an inhibitory action on cAMP phosphodiesterase.[6]The data from this investigation indicate that administration of diazepam results in faster orthodontic tooth movement.

Effect of Vitamin D3 on tooth movement Vitamin D3 has also attracted the attention of some scientist to its role in the acceleration of tooth movement; 1,25 dihydroxycholecalciferol is a hormonal form of vitamin D and plays an important role in calcium homeostasis with calcitonin and parathyroid hormone (PTH). Few investigators[7] have made an experiment where they

have injected vitamin D metabolite on the PDL of cats for several weeks; it was found that vitamin D had accelerated tooth movement at 60% more than the control group due to the increasement of osteoclasts on the pressure site as detected histologically.

PTH EFFECT ON TOOTH MOVEMENT

PTH has been shown to accelerate orthodontic tooth movement on rats, which was studied by continuous infusion of PTH (1 to 10 μg/100 g of body weight/day) implantation in the dorsocervical region, and the molars were moved 2- to 3-fold faster mesially by orthodontic coil spring.[9] Some studies have shown that locally injected PTH induces local bone resorption, and it is more advantageous to give PTH locally rather than systemically.

EFFECT OF LEUKOTRIENES ON TOOTH MOVEMENT

Leukotrienes play an important role in inflammation, allergic, and asthmatic reactions. Their effects can be counteracted by antagonists of leukotriene receptors, such as montelukast and zafirlukast, medication used for asthma, or by inhibition of leukotriene synthesis by a drug such as zileuton. Zileuton selectively blocks the essential enzyme lipoxygenase resulting in inhibition of bone resorption, as well as stimulation of bone deposition, thereby possibly influencing OTM.[10]

EFFECT OF PROSTACYCLINS ON TOOTH MOVEMENT

Prostacyclins (PGI 2) act as vasodilators and prevent platelet aggregation. However, surprisingly, local iloprost administration at dosages from 2.10 −5 to 2.10 −3 μM/12 h significantly increased the rate of OTM evoked by a separation force of 20 cN between rat incisors.36This indicates that the effects of prostacyclins and thromboxanes on OTM are comparable, although their effects on platelet aggregation and vasodilatation are contrary. An explanation can be found in in vitro findings showing that stimulation of either thromboxane receptors or prostacyclin receptors leads to an upregulation of COX-2 and subsequently to a positive feedback loop that also includes prostaglandin synthesis.[11]

Effect of Nonsteroidal Anti-inflammatory Drugs (NSAIDs) on tooth movement

NSAIDs form the most important class of prostanoid synthesis inhibitors. Almost all studies on the effects of NSAIDs during experimental OTM in animals evaluate the effects of a relatively short-lasting administration. They have shown a decrease in the number of osteoclasts, since prostaglandins are involved either directly or indirectly in osteoclast differentiation or in stimulating their activity. There are recommendations that the prostaglandin inhibitors during the orthodontic treatment should be avoided. Acetaminophen was proposed as the analgesic of choice for the orthodontic patients.[12]

Ketorolac is an analgesic that is used for the short-term relief of moderate to severe pain and should not be used for longer than 5 days and for mild pain or for pain from chronic (long-term) conditions.[13]

However, OTM is a multifactorial process over a long period of time, and the effect of long-term use of ibuprofen therefore may differ. In patients with chronic illnesses like juvenile rheumatoid arthritis, osteoarthritis, or gout, where long-term analgesic consumption is needed, the inhibiting effects on OTM may become more evident.[14]

EFFECT OF OPIOIDS ON TOOTH MOVEMENT

Opioids are effective for the treatment of acute and chronic-related pain, i.e., with degenerative conditions such as rheumatoid arthritis, or even during labor and cardiac infraction. Only a very few studies have been performed on the effects of opioids on OTM. The opioids tested were only morphine (INN) and tramadol. However, tramadol is under strict control in some countries. In one rat study, it is reported that daily morphine injections at a dose of 5 mg/kg/day over 14 days reduced the rate of OTM induced by a force of 60 cN.[15] In another study from the same group, daily tramadol injections at a dose of 20 mg/kg/day during 14 days had no effect.[16]

EFFECT OF BISPHOSPHONATES ON TOOTH MOVEMENT

They are used primarily for the prevention and therapy of osteoporosis, Paget's disease, bone metastases, and bone pain

from some types of cancer.They build in the extracellular bone matrix and inhibit bone resorption. Once built in, bisphosphonates have extremely long half-life of 10 years or moreTherefore, they may affect bone metabolism for many years after the patient has completed therapy.[17]Bisphosphonate-related osteonecrosis of the jaws (BRONJ) is a complication described in the long-term bisphosphonate treatment.This is caused by the suppressive and anti-angiogenic effects on epithelial cells and inhibitory effect on endothelial cell proliferation and wound healing.

BIOLOGICAL APPROACH

Experiments have been done using these molecules exogenously to enhance tooth movement both in animal experiments and humans. Example of these molecules are prostaglandin E (PGE), cytokines that include lymphocytes and monocytes-derived factors, receptor activator of nuclear factor kappa B ligand (RANKL), and macrophage colony-stimulating factor (MCSF).[18]

EFFECT OF CYTOKINES ON TOOTH MOVEMENT

High concentration of cytokines such as interleukins IL-1, IL-2, IL-3 IL-6, IL-8, and tumor necrosis factor alpha (TNF) were found to play a major role in bone remodeling; moreover, interleukin-1 (IL-1) stimulates osteoclast function through its receptor on osteoclasts.[3]It was also found that mechanical stress due to orthodontic

treatment increased the production of prostaglandin PGE and IL-1 beta in the periodontal ligaments.

Using biological molecules in the acceleration of tooth movement19has been shown in two unique experiments in which it was demonstrated that the transfer of RANKL gene to the periodontal tissue induced prolonged gene expression for the enhancement of osteoclastogenesis and acceleration of tooth movements in rats. On the other hand, the transfer of OPG gene inhibited orthodontic tooth movements.

RELAXIN EFFECT ON TOOTH MOVEMENT

Relaxin is a hormone that helps during childbirth by widening of the pubic ligaments in females and is suggested to be present in cranial suture and PDL.[20] The role of relaxin is known in the remodeling of soft tissue rather than remodeling of bone. It has been shown that it increases collagen in the tension site and decreases it in compression site during orthodontic movement. Also, the administration of human relaxin may accelerate the early stages of orthodontic tooth movement in rat experiments. However, another study showed that human relaxin does not accelerate orthodontic tooth movement in rats, but can reduce the level of PDL organization and mechanical strength of PDL and increase tooth mobility.[21]

PLATELET RICH PLASMA (PRP) AND DERIVATIVES

PRP is defined as an autologous concentration of platelets in a small volume of plasma and is considered to be a rich source of autologous growth factors (GFs).[22] PRP was first introduced to the dental literature in 1998 in combination with autogenous bone grafts for the reconstruction of mandibular defects, reporting that the addition of PRP to bone grafts resulted in a faster radiographic maturation rate and a higher bone density than bone grafts alone however controversies regarding this potential benefits exists.[23]

Mangal U[24] , Rashid A[25] , Gulec A et al[26] came to the conclusion that by influencing bone quality and speeding up tooth movement, the use of injectable PRP at a different stage of orthodontic treatment can improve the quality of the treatment outcome. Tehranchi A[27]and Nakornnoi Tet al[28]also concluded that it accelerates OTM. Although their long-term effectiveness was debatable, this acceleratory impact was momentary and appeared to diminish at an early stage

CLINICAL APPLICATIONS FOR THE FUTURE

The administration of exogenous biological molecules to accelerate tooth movement during orthodontic treatments has been intensively tested on animal experiments. However, clinical trials on humans are limited since they must be administered occasionally by local injections that can be painful and cause discomfort to the patients avoiding systemic applications, plus their side effect was not tested for long periods of time.

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Instructions to Author for Manuscript Submission

About the Journal

The journal of updates in dentistry is official publication of Surendra Dental College and Research Institute. This journal publishes research papers, clinical studies, reviews and case reports or series related to all the specialties in the field of dentistry. The journal will be published in the month of January and July.

Editorial Process

The manuscript will be reviewed for possible publication with the understanding that it is being submitted to journal of updates in dentistry alone at that point in time and has not been published anywhere, simultaneously submitted or already accepted for publication elsewhere. The journal expects that authors would authorize one of them to correspond with the journal for all matters related to the manuscript. All manuscripts received are duly acknowledged.

Manuscripts accepted for publication are copy edited for grammar, punctuation, print style and format. Page proofs are sent to the corresponding author. The corresponding authors are expected to return the corrected proofs within two days. It may not be possible to incorporate corrections received after that period. The whole process of submission of the manuscript to final decision and sending and receiving proofs is completed through e-mail.

Conflicts of Interest/Competing Interests

All authors of submitting manuscript to the journal must disclose any and all conflicts of interest they may have with publication of the manuscripts or an institution or product that is mentioned in the manuscripts and/or is important to the outcome of the study presented. The authors should also disclose conflict of interest with products that compete with those mentioned in their manuscript.

Types of submission: Original articles, review articles, clinical studies, case reports and short communications.

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Title page: The first page should include:

1. The title of the article (descriptive but concise, including the study design)
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5. Disclaimers, if any.
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7. Running head of no more than 40 characters (including spaces).
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Preparation of Manuscripts

The manuscript should be typed, double-spaced on standard-sized paper (8.5" × 11") with 1" margins on all sides. Times New Roman font 12 pt should be used. The fonts used in the text as well as graphics should be restricted to Times New Roman, Symbol.

Abstract and Keywords: Should be structured and limited to 250 words. A brief summary of the research should be given under the subheadings, introductions, methods, results and conclusion. Not more than six keywords are needed. It should not contain abbreviations, footnotes or references.

Introduction: Description of the research area, pertinent background information and the hypothesis tested in the study should be included under this section. The introduction should provide sufficient background information such that a scientifically literate reader can understand and appreciate the work to be described. A detailed review of the literature is not at all required under this section. The specific aims of the project should be identified along with rationale for the specific experiments and other work performed. The introduction must include in-text citations including a few references pertinent to the background and justification for the study.

Materials and Methods: Materials and/or subjects utilized in the study as well as the procedures undertaken to complete the work. The methods should be described in sufficient detail such that they could be repeated by a competent researcher. The sources of all major instruments and reagents used (kits, drugs, etc.) must be used with parenthesis. Illustrations and/or tables may be helpful in describing complex equipment elaborate procedures. The statistical tool used to analyze the data should be mentioned. All procedures involving experimental animals or human subjects must accompany a statement on ethical approval from appropriate ethics committee.

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Discussion/Conclusion: This section should relate the results section to current understanding of the scientific problems being investigated in the field. Description of relevant references to other work/s in the field should be included here. This section also allows the authors to discuss the significance of the results. This section should end with answers/questions that arise as a result of the author's work.

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Legends for illustrations should use Arabic numerals corresponding to the illustrations. When symbols, arrows, numbers or letters are used to identify parts of the illustrations, identify and explain each one clearly in the legend. Explain the internal scale and identify the method of staining in photomicrographs.

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References: Readers should be provided with direct references to key original research sources, whenever possible. All references must be cited in the text, using the Vancouver style (numbered references). References should be marked in order of appearance with superscript numbers, and listed numerically in the reference list at the end of article.

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1. West JD, Oates TW. Identification of stability changed for immediately placed dental implants. Int J Oral Maxillofac Implants 2007;22:623-30.

Book Reference Style:

1. Lee JS, Kim JK, Park YC, Vanarsdall RL. Applications of orthodontic mini implants. Chicago: Quintessence 2007.
2. Baumgartner JC. Pulpal infections including caries. In: Hargreaves KM, Goodis HE (Eds). Seltzer and Bender's Dental Pulp. Chicago: Quintessence 2002:281-307.

Acknowledgments: Those who have helped the authors carry out the study and/or prepared the manuscripts but have not made significant intellectual contribution to deserve authorship must be acknowledged. Mention all applicable grants and other funding that supports the work.

Review articles: It is expected that these articles would be written by individuals who have done substantial work on the subject or are considered experts in the field. A short summary of the work done by the contributor(s) in the field of review should accompany the manuscripts.

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The journal expects the contributors to give post-publication updates on the subject of review. The update should be brief, covering the advances in the field after the publication of the article and should be sent as a letter to editor, as and when major development occurs in the field.

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