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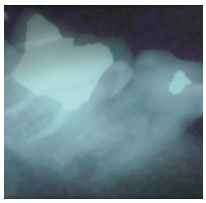


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Guest Editorial

My Dear Colleagues,

It is my honor and my pleasure to be sharing a few of my thoughts with you. I thank Dr Amish Mehta for inviting me to write this editorial.

Today I would like to ask some questions regarding the scenario of dental practice in Gujarat, and maybe start a controversy or two!

Is the dental practice scenario in Gujarat moving in the right direction?

Are you as a practitioner satisfied with the quality of your practice?

The price of many things including petrol, milk and vegetables has almost doubled in the last 3-4 years, but have our charges doubled? Have they even increased 1 ½ times?

I have had senior established dental practitioners complain of reduced income these days compared to 7-8 years back: they say our expenses were much lesser and profits were much higher. Now our expenses and overheads have increased a lot but we are not able to increase our fees! Junior dental practitioners too are not satisfied with their income.

What about newly passed dentists? They are not confident enough to start their own clinic, so they either work in dental colleges as tutors or as associates in established dental practices. But what salary do they get?

Recently a national chain of jewellers, Kalyan Jewellers opened its branches in Ahmedabad, Vadodara and Rajkot. I happened to see their recruitment advertisement in the newspaper, and I was surprised to see that they were offering a starting salary of Rs 20000/- to sales staff: education requirement: any graduate!

Do BDS graduates get such a starting salary?

But what is the public perception of dentists:

Dentists charge a lot of money, dental treatment is costlier than even medical doctors!

But that is not true!

An appendix operation takes less than 30 minutes, but a root canal would take more time yet we charge only a tenth of the cost!

Why do we have to quote a combined fee for treatments: why can't we split the costs in the way our surgical colleagues do?

They charge surgeon's charges, asst surgeon's charges, anaesthetist charges, OT charges, nursing charges and patients are given a long list of medicines and surgical items to buy before the operation.

Why can't we split our treatment costs into procedure charges and material charges?

Beauticians are charging more for facials than we charge for RCTs and crowns!

They are not afraid of charging, and they are getting customers, and their salons are getting bigger and bigger and dental clinics are getting smaller and smaller!

Why do we have the attitude that we are in a noble profession, while the public thinks of themselves as our consumers?

Why can't we get together on an area-wise basis at least if not town-wise and fix some minimum charges? Everyone does that from dhobis to electricians to hotels!

Every complex now has two dentists, and cost-cutting has started! If our charges do not increase, if we try to cost-cut competition, then we would tend to use lower quality materials and over a period of time the overall dental treatment quality would deteriorate and affect everyone!

I have asked a lot of questions today, and I do not know the answers!

But if you believe these are valid questions and issues, then we should all sit together and discuss!

Maybe IDA can take a lead for this.

But let us start with what you feel. I look forward to receiving your views. You can send them as letters (email) to the editor or you can send email to me at drgautammadan@gmail.com

Regards,

Dr Gautam Madan, MDS
Oral and Facial Surgeon
Private Practice: Madan Dental Hospital, Ex-Professor and Head, Dept of Dental, Kesar SAL Medical College, Director, Madan Academy

Greetings from IDA GUJARAT STATE BRANCH

Dear peers in Profession,

Greetings ...

The traditional baisakhi , the festival of reaping harvests, and the ensuing celebrations is finally biting the dust. However our ever productive profession continues to enrich you with the fruits of your hard earned labour.

We are sure that this simmering heat & the chilling thrill of the impending vacations with your family in this summer break will be testimony of that perfect heady mix of combining business with pleasure. The month of June would have already poured its usual quota of the exhilarating rains to bring you back to the paradoxical grind of clinics.

We suggest and encourage you to take a further break & make maximum use of the CDE, CDH programs lined up by the state branch & respective local branches.

Our CDH convenor Dr. Yogesh Chandarana has planned an excellent CDH booklet which is under consideration by the executive committee for publication. We are happy that the Hon. Editor & his editorial board & the general committee members have toiled hard to compile this collection so as to bring it into your comfort zones. As said by the Hon. Editor in issue 1 the executive committee is leaning no stone unturned to make this journal online, accessible to you all at the touch of your fingers in your hand held.

Jai Hind. Jai IDA.

Yours in fraternity,

Dr. Hemant I. Patel

President

Dr. Nitin Parikh

Hon. State Secretary

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"Deciduous canines extraction as a cause of Malocclusion"

Dr. P.G.Makhija[a], Dr. Shalabh Baxi[b], Dr Madhur Navlani[c]

Abstract :
Timely Diagnosis and interception of developing malocclusions is essential for proper growth and development of jawbones in particular and face in general. Malocclusions creep in as a result of wrong decisions of extractions in deciduous or mixed dentition as a part of serial extraction. Sometimes deciduous teeth which cause occlusal interferences are extracted but that itself can lead to harmful orofacial habits resulting in to malocclusion instead of solving it. A case is presented here with history of extraction of deciduous canines followed by development of dentoalveolar anterior crossbite and spacing of lower anterior teeth .Its orthodontic diagnosis and treatment are described.



Key Words : Orthodontic, Class III Malocclusion, Anterior crossbite, Interceptive treatment, Serial extraction, Occlusal interference, Iatrogenic sequelae, Pseudo class III, Limited treatment, Mixed dentition treatment.

Introduction:

When a practitioner is contemplating the correction of an orthodontic problem during development of occlusion, the most crucial decision to make is whether the teeth should be extracted or not, when to extract which teeth to extract and so on. [1]

Serial extractions should never be initiated without a comprehensive diagnosis. Teeth may be extracted with the greatest of ease during a so called serial extraction procedure. However if the basic principles of diagnosis are ignored, the result will be failure and disappointment. More harm rather than help to patient will be done as iatrogenic sequelae may arise as a consequence to wrong diagnosis and interception. Serial extraction will not only be injurious to patient but also injurious to the reputation of practitioner and ultimately to the profession.[2]

If serial extraction is based on thorough diagnosis and carried out carefully and properly on select group of patients, the procedure can be excellent and valuable treatment. Serial extraction can reduce appliance treatment time, the cost of treatment, discomfort to patient, potential iatrogenic sequelae and time lost by patient and parents.

Before attempting the treatment of an orthodontic patient using guidance of occlusion, the practitioner must be prepared to meet the challenge of diagnosis.

This case report deals with extraction of deciduous canines, leading to development of anterior cross bite, diagnosis and interception thereto

Case Report:

A male patient aged 7 years reported with complaint of forward placement of lower teeth with spacing in upper and lower anterior teeth.

Examination : On Extra oral examination, Patient was mesoprosopic, average face, convex profile, competent lips, Prognathic lower lip. On smile, large spaces between upper and lower anterior teeth were seen visible.

Intra oral examination showed mixed dentition with permanent upper central incisors and 1st molars present as well as lower central, lateral incisors and lower 1st **molars. Deciduous as well as permanent lateral incisors were not seen in upper arch, upper lower deciduous and permanent canines were not present,** deciduous 1st and 2nd molars were seen erupted and in occlusion. Spacing between upper and lower incisors was visible as seen in photographs. **Upper deciduous 1st and 2nd molars were in cross bite and so alsothe lower anteriors.** On functional examination, tongue thrust was seen present.

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Past dental history- Parents of child gave the past history of dental treatment for upper and lower teeth in edge to edge bite with each other. The general dentist advised serial extraction and had extracted the upper and lower deciduous canines as according to him they were causing interference in occlusion leading to edge to edge bite. After extraction patient developed forward placement and further spacing between lower front teeth and visited our clinic for opinion and treatment

Habits- mouth breathing and tongue thrusting habits.

Past medical history- Patient gave the history of enlarged adenoids.

Family history- no family histories of skeletal or dental class III tendency were found. Also no history of any missing teeth in parents or siblings.

OPG examination-

The old OPG with patient revealed mixed dentition stage with congenital absence of both upper lateral incisors. Deciduous canines are also seen in OPG which were reportedly extracted by general dentist.

Cepahlometric Findings:

Cepahlometric analyses showed that it was a case of dental proclination of lower incisors. The position of maxilla and mandible was normal for the age. Interincisal angle was more acute than normal suggesting lower incisor proclination so also incisor to mandibular plane angle. Thus clinically as well as radiographically it was established that fault lied with lower incisors cause of which may be attributed to tongue thrust habit which might have developed because of congenital absence of upper; lateral incisors aggravated further by extraction of deciduous canines

Treatment Records

Front Face

Front Smile

3 quarter smile

Profile

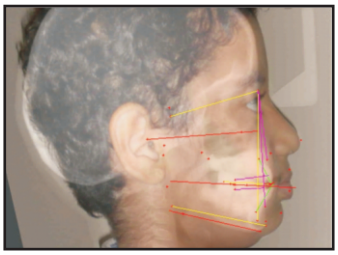
Appliance

Correction

App Removal

Space Maintainer

Lateral cephalogram



Superimposition

Diagnosis : Diagnosis of lower incisor proclination with skeletal class II pattern was made. There was no skeletal class III malocclusion present

Treatment Plan: Retraction of lower anteriors rather than proclination of upper anteriors was decided to be carried out as 1st phase treatment plan.

Treatment procedure: Patient was apprehensive of removable appliance with Z spring for proclination of upper incisors and was afraid of using chin cup and headgear as advised to him by general dentist. Patient motivation was external and not much of cooperation was anticipated. It was decided to fix appliances in innovative way to give fast treatment results and accordingly, lower incisors were bonded with Roth brackets and Begg bondable tubes were bonded to lower 1st molars. .016" AJ Wilcock arch wire of was placed with distal hooks for elastic. Elastic thread was tied through circle hooks of arch wire and passed through lumen of molar tubes and tied. Glass Ionomer bite block was fabricated on lower posterior teeth to remove locking of anterior teeth and facilitate retraction of lower anteriors. Bite block also reinforced posterior anchorage.

Result: Result was achieved in two month time and appliances were removed and patient referred to Pedodontist for space maintainers. Patient was kept under observation and advised periodic follow up so that further orthodontic treatment may be started when permanent canines erupt

Discussion: This patient seems to have developed tongue thrust habit even prior to extraction of deciduous canines as permanent lateral incisors were seen missing in OPG provided by the patient. The lower incisors might have been in edge to edge bite earlier and the dentist without considering such factors, thinking the deciduous canines as cause of anterior crossbite, must have extracted all deciduous canines which lead to further spaces for tongue to become active. When the patient came he already had anterior cross bite and crossbite with upper right 1st and 2nd deciduous molars.

Further He was suggested chincup and Z spring plate for upper anteriors treatment planning by dentist which according to us was not suitable for this patient. The lower deciduous molras were air reduced on buccal surface to guide the upper deciduous molars in to proper occlusion. Thus the general dentist should check all the components of malocclusion locate etiology and consider serial extractions seriously

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Endodontic Management Of A Supernumerary Tooth Fused with Mandibular Third Molar -a Case Report

Dr. Deepika Gaur[a], Dr. Surya Narayan Rai[b], Dr. Naresh Shah[c], Dr. Nitin Parikh[d]

Abstract :

Dental fusion, a rare developmental anomaly present in 0.2% of the general population, consists of the union of two teeth originating from two different tooth germs. The irregular coronal morphology and the complex endodontic anatomy, characterized by the partial or total union of the pulp chambers, together with the peculiarity of the root canal systems, make diagnosis, therapy and rehabilitation difficult. In this article we report a rare management of a case of fusion of permanent mandibular left third molars with supernumerary teeth.

Key Words : Fusion, gemination, supernumerary teeth.

Introduction

Fusion and gemination are developmental anomalies with inherently unusual and bizarre anatomy1. Fusion is commonly identified as the union of two distinct sprouts which occur in any stage of the dental organ. They are joined by dentine; pulp chambers and canals may be linked or separated depending on the developmental stage when the union occurs. Moreover the number of teeth in the dental arch is less than normal. [2]

The etiology of fusion is still unknown, but the influence of pressure or physical forces producing close contact between two developing teeth has been reported as one possible cause.[3] Genetic predisposition and racial difference have also been reported as contributing factors. This anatomic irregularity occurs more often in the deciduous than permanent dentition. In the anterior region this anomaly also causes an unpleasant esthetic tooth shape and the irregular morphology. These teeth also tend to be greatly predisposed to caries and periodontal diseases and in some cases endodontic treatment is complicated.[4] Fusion may occur between teeth of the same dentition or mixed dentition and between normal and supernumerary teeth. Rome et al. reported most fusions necessitate surgical removal of the involved teeth because of their abnormal morphology and excessive mesiodistal width causing crowding, tooth misalignment and occlusion dysfunction[5, 6]. Turell and Nunes et al. reported however, that some fused teeth can be saved[7].

This paper reports a rare case of unilateral fusion of the mandibular permanent second molars with supernumerary elements, which was successfully treated with nonsurgical endodontic therapy.

Case Report -

A 32 years old male reported at the Vaidik Dental College, Daman with a history of pain since two days, with lower left back tooth region. Patient did not complain of previous painful symptoms in that region and his past medical and dental histories were unremarkable. Clinical examination revealed the presence of an irregular morphology of the permanent mandibular left third molar. The aspect of the dental elements suggested union of a supernumerary tooth crown with the distal crown of the third left molar. In addition increase mesio distal crown width plus distinct developmental occluso-gingival grooves on the labial and lingual surface are noticed. The clinical examination also revealed the extent of carious lesion till the pulp chamber. The left third mandibular molar did not respond to pulp testing and was tender to percussion, whereas the right second molar responded within normal limits. Radiographic examination showed the extent of the carious lesion till pulp chamber and the union of a supernumerary tooth with third permanent molar. The

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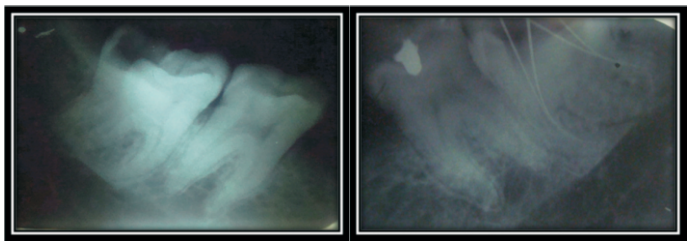
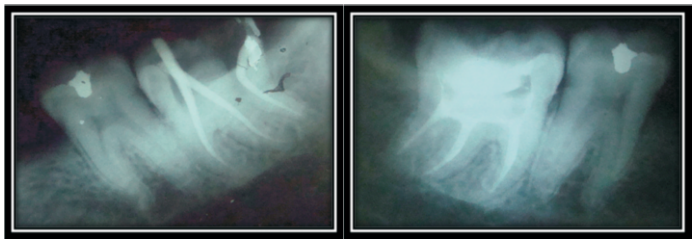
remaining maxillary and mandibular permanent teeth were normal in shape as well good dental health. A diagnosis of necrotic pulp with irreversible pulpitis of endodontic origin was established.

Patient was explained about root canal treatment and was consent was taken. Tooth 48 was anaesthetised. The canal was accessed, four canal opening were found, three distally and one mesially. Working length was determined with an apex locator (NSK-I-PEX) and confirmed by radiograph.

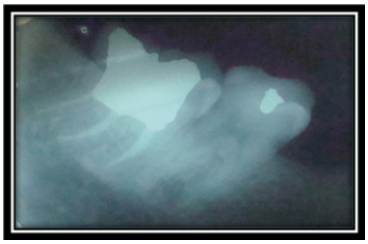
The root canal was prepared in a crown-down method. Sodium hypochlorite (2.5%) and EDTA (17%) solutions were used alternately as irrigants. When the preparation was completed, the canal was dried with paper points and a calcium hydroxide dressing was placed (Ultracanal, Optident,Skipton, UK). Before obturation , use of 17 % aquous EDTA was used done for one minute, the liquid was agitated in the canal with the last file used and the canal was flushed with saline and then proceed for obturation. The canals were dried with the help of pre sterilized paper points. Canal was coated with the sealants (ZOE) with EZ file till working length. Master cone was coated with sealer and pushed into the canal with the help of pumping action. Use of spreaders was done for lateral compaction. Pluggers were used for vertical compaction in the coronal 1/3rd region. Confirmation of the obturation was done by radiograph. Coronal seal was placed with silver amalgam.



Preoperative Radiograph Working Length Determination



Master Cone Selection Obturation



Obturation with Post Obturation Restoration

Discussion

Since abnormal tooth morphology can predispose to caries and periodontal disease, careful management of fused teeth is essential. Lyroudia et al. (1997) used computerized 3-Dreconstruction of two 'double teeth' in vitro. They revealed very complex internal anatomy and stressed the importance of familiarity with the root canal morphology before starting endodontic treatment8. Recently, the importance of the operating microscope, a tool for better diagnosis and better quality of care, has been stressed (De Carvalho & Zuolo 20009, Schwarze et al. 200210, Yoshioka et al. 200211). It is important to emphasize that using higher magnification helped to locate and negotiate the root canals more easily. Clinically, it may be difficult, if not impossible, to differentiate fusion from germination when supernumerary teeth are involved. Teeth with this abnormality are unaesthetic due to their irregular morphology. They also present a high predisposition to caries and periodontal disease, and spacing problems[1]. The main periodontal complication in fusion cases occurs due to the presence of fissures or grooves in the union between the teeth involved. If these defects are very deep and extend subgingivally, the possibility of bacterial plaque accumulation in this area is quite high. Strict oral hygiene is imperative to maintain periodontal health. Furthermore, fusion may have an adverse effect on occlusion, causing deviation and, sometimes, delaying the eruption of other teeth[5]. In this case, the traumatic occlusion resulting from tooth mandibular left second molar being out of alignment may be the reason for the pulp necrosis.

Efforts must be directed to understand the root canal anatomy in order to avoid treatment complications. Despite the fact that surgical therapy may be necessary in some cases, a thorough knowledge of the complexity of root canal morphology in addition to adequate operative procedures appear to be the main requirements for successful endodontic treatment of these dental abnormalities. Difficult cases include a wide spectrum of problems. The best way to manage these difficult cases depends on a number of factors including the knowledge and technical skills of the practitioner.

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Oral Appliances For The Treatment Of Obstructive Sleep Apnea

Dr. Ishan Patel[a], Dr. Ronak Panchal[b]

Abstract :

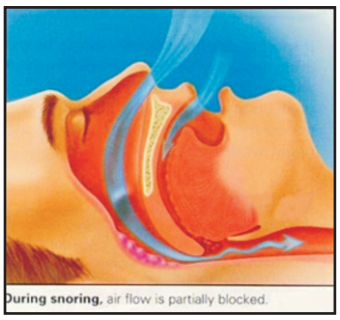
Patient acceptance has, in general, been in favor of oral appliances. Notwithstanding the expanding role of oral appliance therapy, there are a number of limitations that are yet to be overcome. Key issues include the inability to reliably predict treatment outcome, the apparent need for an acclimatization period to attain maximal efficacy of treatment, uncertainty about selection of the appropriate 'dosage' of mandibular advancement required to control OSA in the individual patient, uncertainty about the influence of appliance design on treatment outcome and adverse effects, adherence to treatment, and potential long-term complications of therapy. These issues require resolution before oral appliance therapy can surpass CPAP as first-line treatment for OSA.

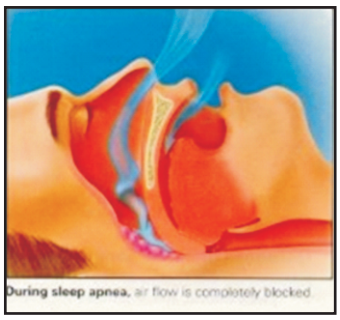
Many unnswered questions remain in this field. Much work is required to better quantify the impact of OSA therapy on a broad range of outcomes, regardless of the therapeutic technique. Comparing markedly different treatments such as oral appliances vs surgery is complex when the former is worn only at night, and the latter has an effect on airway size on the long term.59 The different response trajectories and the absolute cost of treating a progressive disease such as OSA complicate direct data comparisons.

Key Words : Obstructive Sleep Apnea, Oral Appliance, CPAP, Mandibular Advancement Splint

INTRODUCTION

Obstructive sleep apnea is a condition in which the flow of air pauses or decreases during breathing while you are asleep because the airway has become narrowed, blocked, or floppy.[1] It is a major medical problem affecting up to 4% of middle-aged adults.[3] The prevalence rises dramatically with age, to an estimated 28% to 67% for elderly men and 20% to 54% for elderly women.[4]





Chronic, persistent snoring is a common symptom that increases in prevalence throughout the lifespan, with well over 50% of individuals over the age of sixty reporting it. The other common complaints are disrupted sleep, and excessive daytime sleepiness. Snoring is caused by interplay between a variety of factors, including sleep-related loss of muscle tone in the tissues supplied by the glossopharyngeal nerve, anatomical obstruction of the nasal passages, large tonsils, large tongue, a retrognathic mandible, obesity, alcohol, sedative medication, allergies, and certain medical conditions.[2] The snoring sound is produced by the vibration of the soft palate or other oropharyngeal tissues. It can become a medical concern because it is a key symptom of obstructive sleep apnea syndrome (OSA). Patients with apnea may develop cardiovascular abnormalities, such as coronary heart disease, hypertension, and stroke, because of the recurrent nocturnal hypoxemia and hypercapnia.[5]

Diagnosis of OSA is based on the following: (1) a comprehensive history from the patient and his/ her sleeping partner; (2) ear, nose, and throat examination; (3) body mass index; and (4) overnight polysomnography, which is regarded as the definitive investigation for the diagnosis of OSA, permitting the distinction between OSA and simple snoring.[6] The severity of OSA is expressed as the Apnea- Hypopnoea Index (AHI) and is the number of apneas (cessation of breathing lasting 10 or more seconds) and hypopneas (50% reduction in tidal volume, accompanied by a 4% or greater fall in oxygen saturation lasting 10 seconds or more) per hour of sleep.

Due to the multifactorial nature of this condition, management includes a multidisciplinary approach. The team may include a thoracic physician, ear, nose, and throat surgeon, orthodontist, restorative dentist, and oral and maxillofacial surgeon.

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The treatment modalities consist of both surgical and nonsurgical methods. The nonsurgical approaches to treatment include weight loss, reduction in smoking and alcohol consumption, nasally applied continuous positive airway pressure (CPAP), considered to be the long-term treatment of choice and regarded as the gold standard,[7] and oral appliances. Surgical interventions include: (1) genioglossus tongue advancement, (2) maxillomandibular advancement, (3) laser-assisted uvuloplasty (LAUP), (4) uvulopalatopharyngoplasty (UPPP), and (5) tracheostomy.[8]

As the general public and Orthodontics specialty better recognize the interactions between craniofacial form and overall health, orthodontists might be expected to become proficient in a broader range of health issues. Sleep disordered breathing, which includes snoring and obstructive sleep apnea (OSA), is one such field. Orthodontists, based on their knowledge and training with functional appliances and their skills to evaluate jaw position and tooth movement, are ideally suited to provide oral appliances as an effective form of therapy.

There is much literature about the efficacy of oral appliances. Many extensive reviews have been written,[9,10,11,12,13] and specific guidelines for therapy with oral appliances have been developed.[14] An oral appliance is commonly regarded as a simple, silent, bed-partner friendly, less invasive, reversible, tolerable, and efficacious choice for mild-to-moderate OSA and has been demonstrated to have a beneficial impact on a number of essential medical outcomes, including polysomnographic data, subjective and objective measurements of sleepiness, cardiovascular functions, neuropsychological behaviors, and quality of life indexes.

Clinical evidence-based studies have demonstrated solutions to manage titration and reduce side effects to enhance long-term compliance for adult patients. Patients who require oral appliances for snoring or OSA are referred directly to the dentist by their attending sleep physician or family physician after an assessment of their sleep disorder that can include at-home or in-hospital monitoring.

Oral Appliances

There are more than 80 different oral devices on the market for the treatment of obstructive sleep apnea and snoring, according the dental sleep medicine web site "Snoring Isn't Sexy." [60] The great preponderance of them are varieties of "mandibular repositioning dental appliances," devices that move the lower jaw forward. Most of the remainder are "tongue retaining appliances." Both serve to reduce the likelihood of the sleeper's tongue falling backward far enough to block the airway.

The last decade has seen the emergence of oral appliances in the clinical management of snoring and obstructive sleep apnea (OSA). This has been driven by the need for simple and effective treatment options for these highly prevalent disorders. The idea of using a dental prosthesis to reduce upper airway obstruction is not new. Pierre Robin [15] described such a concept in children with life-threatening upper airway obstruction related to micrognathia and glossoptosis, well before OSA was even recognized as a disorder. The use of oral appliances for the treatment of sleep related upper airway obstruction was first reported some 25 years ago [16,17]

A key milestone in the field was the systematic review conducted by the American Academy of Sleep Medicine (AASM) a decade ago [18], highlighting the inadequacy of existing evidence at that time and the need for rigorous scientific evaluation. Whilst it has taken a relatively long time for the evidence base to reach a level that supports their use in clinical practice, that time has now arrived, and it is important for clinicians involved in the management of snoring and OSA to have a sound working knowledge about this treatment modality.

Nasal continuous positive airway pressure (CPAP) is the current treatment of choice, but its cumbersome nature makes tolerance and compliance less than optimal. This gives rise to the need for other alternatives that are equally effective, but more tolerable. There is growing interest in the use of oral appliances to treat snoring and OSA.

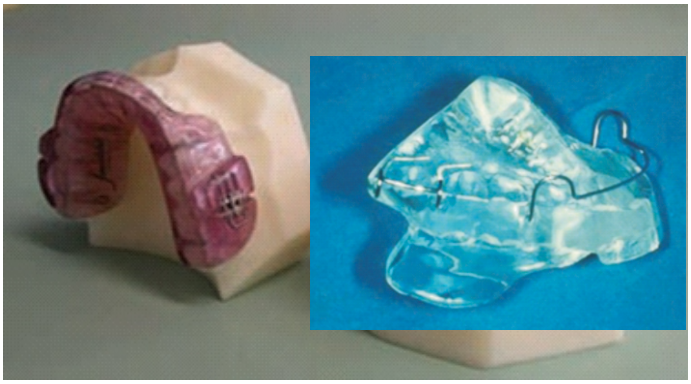
The rationale is that advancement of the mandible and/or tongue and related soft tissues impacts positively on upper airway caliber and function.[19,63] There are many such types of appliances, and they have potential advantages over CPAP in that they are unobtrusive, make no noise, do not need a power source, and are potentially less costly. There is a growing evidence base to support the use of oral appliances in the management of OSA.[20]

Oral appliances used for OSA generally fall into one of two classes, viz. mandibular advancement splints (MAS) and tongue retaining devices (TRD). MAS induce protrusion of

the mandible by anchoring a removable device to part of or the entire upper and lower dental arches, while TRD use a suction cavity to protrude the tongue out of the mouth. MAS are far more widely used in clinical practice and there is an extensive literature on their use, compared to TRD. There are many designs available, but they generally fall into either one-piece (monobloc) or two-piece (duobloc) configurations.

Beyond this, they can differ substantially in size, type of material, degree of customization to the patient's dentition, coupling mechanism, amount of occlusal coverage, titratability of mandibular advancement, degree of mandibular mobility permitted (vertical and lateral), and allowance for oral respiration.[21]

The prevailing view has been that the primary mechanism of action of MAS arises from the anterior movement of the tongue, and the consequent increase in the anteroposterior



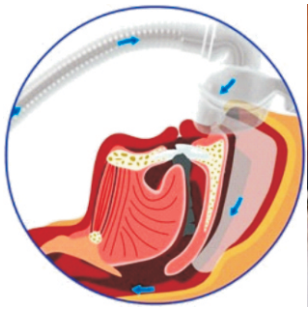
dimensions of the oropharynx. In particular, it has been proposed that the improvement in velopharyngeal dimensions is mediated through stretching of the palatoglossal and palatopharyngeal arches[22].

The mechanism of action of TRD is likely to be a little different compared with mandibular advancement devices.[21] The forward movement of the tongue out of the oral cavity tends to be greater than the tongue advancement achieved with a mandibular advancement device, and this may produce more favorable anatomical changes in the retroglossal

region. In addition, it is possible that they counteract the effect of gravity on the tongue in the supine position.

Since the systematic review of 1995 [18], there has been a substantial increase in the quantity and quality of research evaluating oral appliances[19,20]. Whilst the early focus was on polysomnographic outcomes, there has been a necessary shift toward the evaluation of the impact of oral appliances on a range of important health outcomes, including daytime symptoms, neurocognitive function, and cardiovascular outcomes.

The overall success rate is dependent on the definition used, with almost 70% of patients achieving a greater than 50% reduction in the apneahypopnea index (AHI)[25], and up to 50% achieving an AHI < 5/hour [23,24,26]. Given that the aim of treatment is to resolve OSA, it is important that the more stringent definition of treatment outcome be used. With regards to oxygen saturation parameters, studies have identified improvements in the minimum oxygen saturation, but rarely to normal levels. This is not surprising as, unlike CPAP, oral appliances do no inflate the lungs. With regards to sleep architecture and arousals, the data are less consistent, with only some studies reporting an increase in rapid eye movement sleep and reductions in the arousal index [23,24,26].



Oral Appliance v/s CACP

Although oral appliances are effective in some patients with obstructive sleep apnoea (OSA), they are not universally effective. A novel anterior mandibular positioner (AMP) has been developed with an adjustable hinge that allows progressive advancement of the mandible. This crossover study compared efficacy, side effects, patient compliance, and preference between AMP and continuous positive airway pressure (CPAP) in patients with symptomatic mild to moderate OSA. They concluded that AMP is an effective treatment in some patients with mild to moderate OSA and is associated with greater patient satisfaction than CPAP.[31]

Many studies have been completed to compare oral appliances and CPAP; they have consistently reported that CPAP is effective in reducing apnea hypopnea index scores and improving oxygen saturation levels more than oral appliances, but that patients wear their oral appliances longer.[10,11,12,13] Both

treatments appear to improve subjective and objective sleepiness, cognitive tests, and quality of life. Patients wear their oral appliances longer each night, and most patients indicate a clear preference for this form of therapy.[29,30]

There is increasing evidence suggesting that oral appliance improves subjective sleepiness and sleep disordered breathing compared with a control. CPAP appears to be more effective in improving sleep disordered breathing than oral appliance. The difference in symptomatic response between these two treatments is not significant, although it is not possible to exclude an effect in favour of either therapy.[27]

Another review suggests that CPAP is effective in reducing symptoms of sleepiness and improving quality of life measures in people with moderate and severe obstructive sleep apnoea (OSA). It is more effective than oral appliances in reducing respiratory disturbances in these people but subjective outcomes are more equivocal. Certain people tend to prefer oral appliances to CPAP where both are effective. This could be because they offer a more convenient way of controlling OSA.[28]

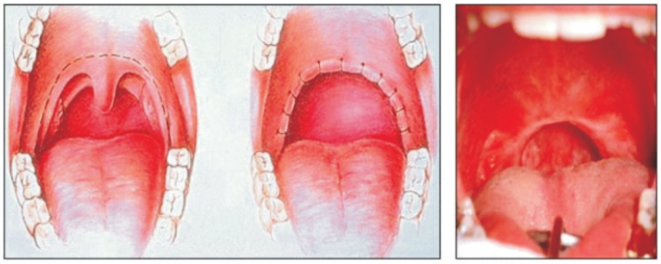
In a recent study, it was documented that most OSA patients who had already been successfully treated with CPAP could effectively use an oral appliance as a treatment alternative, since it partially or completely reduced the sleep-disordered breathing even in those with severe OSA.[30] Both CPAP and oral appliances have an effect on blood pressure. Based on 20-hour monitoring, significant reductions in diastolic blood pressure and mean arterial pressure have been quantified with oral appliances.[32]

Until there is more definitive evidence on the effectiveness of oral appliance in relation to CPAP, with regard to symptoms and long-term complications, it would appear to be appropriate to recommend oral appliance therapy to patients with mild symptomatic OSAH, and those patients who are unwilling or unable to tolerate CPAP therapy. Future research should recruit patients with more severe symptoms of sleepiness, to establish whether the response to therapy differs between subgroups in terms of quality of life, symptoms and persistence with usage. Long-term data on cardiovascular health are required. [27]

Oral Appliance v/s Surgery

A recent Cochrane review concluded that the data needed to conduct a systematic review of surgical procedures were lacking. [35] The reported rates of improvement in the apneahypopnea index with uvulopalatopharyngoplasty vary 36; the rate of long-term effectiveness (as evidenced by a reduction in the apneahypopnea index of at least 50 percent and a postoperative apnea hypopnea index below 10) is less than 50 percent. [37] The procedure has been associated with complications, including postoperative pain, bleeding, nasopharyngeal stenosis, changes in the voice, and in rare cases, death.[38]

The effect of oral appliance treatment was compared with that of UPPP in one trial [33]. After a one-year treatment period, a significant difference in the AHI in favor of the oral appliance treatment was observed. However, other physiological parameters, including the hourly rate of oxygen desaturations



(≥ 4%) and registered snoring time, did not differ between the two interventions. Although, after six months of treatment, subjective daytime sleepiness was less in the uvulopalatopharyngoplasty(UPPP) group, no significant difference in sleepiness was observed after a one-year treatment period.

In a separate publication reporting on changes in quality of life, the UPPP group showed a greater level of contentment than the oral appliance-treated patients after a one-year treatment period [34]. Since no other trials compared oral appliance therapy with UPPP, a pooled estimate could not be calculated. The effect size of the AHI demonstrated that mandibular advancement therapy was more effective than UPPP.

Side Effects

Commonly reported minor and temporary side effects included TMJ pain, myofascial pain, tooth pain, salivation, TM joint sounds, dry mouth, gum irritation and morning-after occlusal changes. These phenomena were observed in a wide range of frequency from 6% to 86% of patients.[23,29,39,40,41,42,43,44,45,46,47] Most authors described these effects

as "transient", or "minor" and reported resolution within several days to several weeks with regular use and occasional adjustment of OA fit.

More severe and continuous side effects included TMJ pain, myofascial pain, tongue pain (tongue devices only), gagging (soft palate lifter mostly), tooth pain, gum pain, dry mouth and salivation. Occasionally, these phenomena prevented continued use of the appliance.[48,49,40,44] Observation of these effects occurred within a range of 0% to 75% of patients.[40,44,48,49,50,51,52,53,54,55] Significant and persistent TMJ problems were rare.

There are many potential side effects and complications associated with OA therapy but most are minor and temporary and do not significantly affect appliance use. 25 Many of the minor side effects (discomfort or excessive salivation) improved even with continued appliance use. However, others are more significant and do not necessarily resolve over time and may lead to discontinuation of OA treatment.[61] Some of the bite changes did not resolve with cessation of therapy and more information is needed about the significance of these occlusal changes and the risks of long-term appliance use.

Conceivably, these changes may be due to frank tooth movement, remodeling of the TMJ complex or neuromuscular adaptation that may have an influence on the posture of the mandible. The response of some patients to exercises suggests that it may be related to a failure to reposition the mandible into the glenoid fossa. Additional cephalometric, radiographic and clinical studies are needed to elucidate the importance of these changes.[62]

Indications And Contraindications

Several exclusion criteria should be taken into account when MRA therapy is considered. These include an insufficient number of teeth, (extensive) periodontal disease or dental decay, active temporomandibular joint disorders, and restrictions in mandibular opening or protrusion. [58] In one study adopting similar exclusion criteria, MRA therapy was contraindicated in 34 out of 100 consecutive OSAHS patients [56]. However, although some consider a minimum of ten sound teeth in each of the maxillary and mandibular arches a requisite in MRA treatment, the location rather than the number of teeth may be more important (i.e., posterior teeth provide more adequate retention) [56].

According to recommendations of the American Sleep Disorders Association, OA therapy should be considered in patients with simple snoring or mild OSAHS who do not respond to or are not appropriate candidates for conservative management.[18] In moderate to severe OSAHS, the recommendation is to consider OA therapy when patients do not tolerate or refuse CPAP, and when patients are not candidates for or refuse surgical intervention. Recent reports demonstrating the effectiveness of Oral Appliances in moderate and severe OSAHS probably necessitate redefinition of these recommendations. [57]

Conclusion

Patient acceptance has, in general, been in favor of oral appliances. Notwithstanding the expanding role of oral appliance therapy, there are a number of limitations that are yet to be overcome. Key issues include the inability to reliably predict treatment outcome, the apparent need for an acclimatization period to attain maximal efficacy of treatment, uncertainty about selection of the appropriate 'dosage' of mandibular advancement required to control OSA in the individual patient, uncertainty about the influence of appliance design on treatment outcome and adverse effects, adherence to treatment, and potential long-term complications of therapy. These issues require resolution before oral appliance therapy can surpass CPAP as first-line treatment for OSA.

Many unnswered questions remain in this field. Much work is required to better quantify the impact of OSA therapy on a broad range of outcomes, regardless of the therapeutic technique. Comparing markedly different treatments such as oral appliances vs surgery is complex when the former is worn only at night, and the latter has an effect on airway size on the long term.[59] The different response trajectories and the absolute cost of treating a progressive disease such as OSA complicate direct data comparisons.

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Gorlin's Syndrome

Dr. Purnima Jethwa[a]

Abstract :

Gorlin's syndrome is a sporadic as well as familial incidence affecting the skin, jaw, skeletal system and other soft tissue with equal frequency in both sexes. It is characterized by multiple nevoid basal cell lesions, basal cell carcinomas, multiple impacted teeth, jaw cysts, frontal and temporoperietal bossing of the skull, ocular hypertelorism, bifid, fused, and rudimentary ribs and other soft tissue anomalies like superficial fibromata, lipomas. The following is a case report of this rare condition and its management.

Key Words : Fusion, gemination, supernumerary teeth.

INTRODUCTION

The Gorlin's syndrome often proves fascinating to the clinician but not to the victim! It is also known as the basal cell nevus syndrome, multiple jaw cyst syndromes. It has both a sporadic and familial incidence. When it occurs in more than one member of a family, it appears to be inherited through an autosomal dominant gene with high presence and variable expressivity. Jarisch (1894) seems to have been the first to describe the disorder. Gorlin et al (1965) analysed 150 cases from the literature and catalogued all the abnormalities. Cysts of the jaw were the presenting symptom in 50% of their series. The cyst did not involve the primary dentition; thus they only appeared from 7 years of age onward. Basal cell skin lesions usually do not appear until the third or fourth decade. Rayne (1971) has been reported number of ocular anomalies, including dystopania canthorum, hypertelorism and congenital cataract. A variety of skeletal anomalies may be found in as many as 75% of affected persons.

Recent work in molecular genetics has shown gorlin's syndrome to be caused by mutation in the PTCH (patched) gene found on chromosome arm 9q (4).

This case report is means to discuss and review its clinical and radiographic features and the need for a multidisciplinary approach to its treatment involving the maxillofacial surgeon, orthodontist and prosthodontist.

CASE REPORT :-

11 year old child presented to clinic with the complaint of swelling as well as multiple teeth which are present in the mouth not properly aligned.

PIC. 1. EXTRA ORAL VIEW.

The patient was of average height and moderately built. Clinical examination revealed the presence of extra oral swelling in upper anterior region of maxilla, flattening of nasolabial fold both side and wide inter canthal distance. Intra oral examination revealed the presence of swelling at the upper anterior maxilla from lt. Canine to rt. Canine, a few malaligned permanent teeth in the upper and lower jaw with wide spacing between the teeth anteriorly. X-ray examination

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OPG shows multiple impacted teeth, extrafollicular dentigerous cysts relationship to an unerupted tooth particularly in the maxilla both the side.

PIC. 2. INTRA ORAL VIEW.

Further examination of chest X-ray revealed bifid ribs at the coasto chondral junction. There was no other obvious clinical abnormality. Other radiographs of the skull, pubic region, etc did not reveal any significant findings. No any kind of skin lesion present right now as it is appearing until the third or fourth decade. Screening of asymptomatic relatives done.

Considering the age of the patient I advocated a multidisciplinary approach to this problem. All over retained and unrestorable deciduous as well as supernumerary teeth were removed, marsupialisation of extrafollicular dentigerous cyst done to allow the permanent teeth eruption or to allow bone to regenerate over the roots of adjacent teeth under general anaesthesia. Orthodontic treatment was advised for the correction of his malaligned teeth. Space maintainer used to maintain the space for permanent teeth.

PIC. 3. RADIOGRAPHIC VIEW

DISCUSSION:-

Gorlin's syndrome, basal cell nevus syndrome, multiple jaw cyst syndrome is characterised by abnormalities like multiple nevoid basal cell lesions, basal cell carcinomas, jaw cysts, skeletal anomalies, and other soft tissue aberrations.

Jarisch (1894) seems to have been the first who describe the disorder. The name Goblin syndromes refers to researcher Robert J. Gorlin (1923-2006) [1&2].

According to Gorlin et al (1965) cysts of the jaw were the presenting symptoms in 50% of their series. The cysts did not involve the primary dentition; thus they only appeared from 7 years of age onward. The cysts were keratocysts in the majority of instances. Not frequently, however, the cysts had an extrafollicular dentigerous relationship to an unerupted tooth. Geminated and missing teeth, along with other dental defects, are mentioned from time to time. In this particular case the multiple impacted teeth associated with extrafollicular dentigerous cysts which are not involving the primary dentition are present.

PIC.4 NO SKIN LESION.

People with this syndrome are particularly prone to developing a common and usually no life threatening non melanoma skin cancers. About 10% of people with this condition do not develop the basal cell carcinoma. A variety of skin lesions may be seen like small whitish spots, or milia particularly around the eyes. The skin of the palms and soles of the feet is affected by a dyskeratosis, which leads to the formation of characteristic pits (mantoux's porokeratosis). Epidermal cysts may be found under the skin in many parts of the body but most often on the hands. Basal cell nevi, which vary in appearance from a whitish plaque to a raised excrescence like a skin tags, may be found on the face, neck and trunk. Some on both exposed and unexposed surface may progress to an overt basal cell carcinoma. Basal cell skin lesions usually do not appear until the third or fourth decade. In this case patient is 11 years old and no any significant skin lesions noticed. [1,2&3]

A variety of skeletal anomalies may be found in as many as 75% of affected persons like bifid, fused and rudimentary ribs, frontal and temporoperietal bossing of the skull, well developed supraorbital ridges in men and ocular hypertelorism. In this case bifid ribs, frontal and temporoperietal bossing as well as ocular hypertelorism are noticed. Other skeletal deformity that can occur include occult spina bifida or fusion of vertebrae, bridging of the sella turcica, sterna deformities, sprengel's deformity of the shoulders, shortening of metacarpals, and bridging of the vertebral sulcus of the atlas. Only bifid rib is visible in this patient.

Rayne (1971) also has been reported number of ocular anomalies, including dystopania canthorum and congenital cataract. [1]

Radiographic features are characterised by the presence of numerous unerupted supernumerary as well as permanent teeth with, not frequently, extra follicular dentigerous cysts. In this particular case 21 impacted supernumerary and permanent teeth with extra follicular cysts in relation to over retained deciduous maxillary anterior teeth and permanent lateral and canine as well as with lateral and canine of the mandible are seen.

There is no specific treatment for Gorline's syndrome, though in recent times a more multidisciplinary mode of the treatment involving the oral surgeon, pedodontist, orthodontist and prosthodontist has been advocated. With respect to the condition in general, life time follow up care is indicated, not only to exclude cyst recurrences but also to monitor for the basal cell skin lesions. [1,2,and4.]

CONCLUSION:-

A report is made of a case of Gorlin's syndrome which had features typical to it which included a multiple impacted teeth with extra follicular cysts in relation to permanent teeth, bifid ribs, frontal and temporoperietal bossing, ocular hypertelorism without any skin lesions which usually appear during third or fourth decade.

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Restoration of Badly Mutilated Maxillary Canine Tooth

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Abstract :

Management of carious maxillary right canine involving pulp frequently poses problem during endodontic management. This report describes to treat the patient with this alternative technique. Achieving internal reinforcement by placing cast metal post and core to the residual tooth root provides retention and adds stability to the prosthesis. At the one-year clinical examination, the prosthesis exhibited no evidence of failure and the patient was satisfied with its function and esthetics.

Key Words : Cast Metal Post And Core

INTRODUCTION

The majority of endodontically treated single rooted teeth with a lack of coronal tooth structure can be restored using posts and cores. However, many anterior teeth that require post retained restorations are severely weakened as a result of recurrent caries extending into the radicular dentine around pre-existing posts or the fact that the pulp has become necrotic prior to the completion of root formation in a young patient. Other, less common conditions include developmental anomalies such as fusion and germination, internal resorption, and iatrogenic damage resulting in large access preparations.[1] The resulting large, flared root canals have thin dentinal walls leaving them too weak to withstand normal masticatory forces and prone to fracture as a result.[2] Such teeth may also lack sufficient coronal tooth structure and pose a problem to the restorative dentist.

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These compromised teeth are difficult to restore for a variety of reasons. The geometry of the flared canal also results in a very wide, tapered and unretentive post.[3,4] In these situations, if a prefabricated post is used, the excess space within the root canal would be taken up with a bulk of luting cement. This results in a potentially weak area in the restoration.[1] Placement of dentine pins to help retain the core is also not feasible because there is likely to be insufficient dentine present at the coronal portion of the root.[5] Thus, these methods of restoration are unsatisfactory and often result in extraction of the tooth. Here is a case report of restoration of badly carious maxillary canine with flared canal using cast metal post and core restoration.

CASE REPORT

A 35 year old male patient reported in Department of Prosthodontics, K. M. Shah Dental College and Hospital, Vadodara, Gujarat with badly broken maxillary right canine. Intra oral examination revealed carious maxillary right canine involving pulp. A radiographic and clinical examination revealed the need for endodontic therapy (Fig. 1.) and a cast post-and core buildup. An endodontist from the endodontics clinic performed root canal therapy (Fig. 2). The endodontist used a lateral compaction technique to fill the root canals to the level of the canal orifices. Then the patient was referred to the Prosthodontics. At the next visit, the gutta-percha was removed from the pulp chamber leaving 4 millimeters of gutta-percha in the apical portion of the canal to create a space for the post-and-core assembly. The canal was shaped with Peeso reamers (Moyco Union Broach, York, Pa.) to a final diameter

of 1.25 mm. The unsupported tooth structure was trimmed and a resin pattern (Palavit G, Heraeus Kulzer GmbH, Hanau, Germany) was adapted to the prepared canal and pulp chamber (Fig. 3.). The post-and-core pattern was invested and cast (Fig. 4 and 5.). After adjusting the post-and-core assembly, a no. 40 Lentulo spiral filler (Dentsply Maillefer, Ballaigues, Switzerland) was used to introduce the luting type glass ionomer cement into the canal space. The post-and-core assembly was coated with cement (Fig. 6) and seated it slowly by using finger pressure maintained for eight minutes. Then the excess cement was removed. Gingival retraction was done using retraction cord saturated in tetrahydrozoline solution. The impression was made using polyvinyl siloxane impression material (Aquasil, Dentsply, Switzerland). The working model was made from Type IV dental stone (Fujirock, GC, Tokyo). A porcelain-fused-to-metal (PFM) crown was fabricated on the model and cemented using luting type glass ionomer cement (Fig. 7).

Fig. 1. Preoperative Photograph

Fig. 2. RCT done

Fig. 3. Pattern resin adapted

Fig. 4. Post and core pattern

Fig. 6. Post and core cemented

Fig. 5. Cast metal post and core

Fig. 7. PFM crown cemented

DISCUSSION

The technique described above seems to be effective for extensively damaged teeth that lack sufficient tooth structure to create an adequate ferrule of 1.5 to 2 mm for the final crown using conventional post-and-core restoration. When insufficient tooth structure exists to prepare a tooth for coronal coverage, the clinician must use a technique that restores lost dentin. Lengthening the clinical crown by removing supporting alveolar bone to expose more sound tooth structure may be effective, but typically it produces other problems.[6,7] Because the crown lengthening procedure may compromise the supporting bone, we decided to extrude the tooth; however, the patient refused to have orthodontic brackets placed. As a result, we decided to treat the patient with this alternative technique. Achieving internal reinforcement by placing cast metal post and core to the residual tooth root provides retention and adds stability to the prosthesis. At the one-year clinical examination, the prosthesis exhibited no evidence of failure and the patient was satisfied with its function and esthetics.

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"Effect of 5% Potassium Nitrate Versus 10% Cpp-acp and Novamin Containing Dentifrice on Dentinal Hypersensitivity - An In-vivo Study"

Dr. Pooja Keshrani[a], Dr. Ruchi Rani Shah[b], Dr. Tulsi Sanghavi[c], Dr. Nimisha Shah[d]

Abstract :

OBJECTIVES: The aim of the study was comparative evaluation of the efficacy of 5% potassium nitrate versus 10% CPP-ACP and Novamin containing dentifrice in the treatment of patients with dentin hypersensitivity using VAS scale. **METHODOLOGY:** 75 patients with a complain of tooth hypersensitivity who met the inclusion criteria were randomly assigned to all the three treatment groups: GROUP 1- 5% potassium Nitrate Toothpaste (Colgate Sensitive Original, Colgate-Palmolive (India) Ltd, India.) and GROUP 2- 10% CPP-ACP Toothpaste (GC tooth mousse, GC Corporation, Tokyo, Japan), Group 3-Novamin(Vantej-Dr.Reddy's laboratories, Hyderabad, India). Patients in Group 1(5% KNO3) and Group 3(Novamin) were instructed to brush twice daily according to manufacturer's instruction. Group 2 patients were instructed to apply CPP-ACP paste every night before sleep. Scores to tactile stimuli and air blast were recorded at baseline,15 minutes,4 weeks and 6 weeks on the visual analogue scale (VAS Scale) of 10cm. These scores were subjected to statistical analysis. **RESULTS :** All the desensitizing agents caused a significant reduction in dentin hypersensitivity over a period of 4 weeks and 6 weeks. There was no significant difference found between 10% CPP-ACP and 5% Potassium Nitrate but there was a significant difference between 5% Potassium nitrate and Novamin and 10% CPP-ACP and Novamin.

CONCLUSION : All the three dentifrices significantly decrease hypersensitivity. Novamin more effectively decreases hypersensitivity than 5% KNO3 and 10% CPP-ACP.

Key Words : Dentinal Hypersensitivity, KNO3, CPP-ACP, Novamin, VAS scale

INTRODUCTION

Dentine hypersensitivity is characterized by pain derived from exposed dentine in response to chemical, thermal, tactile or osmotic stimuli which cannot be explained as arising from any other dental defect or pathology.[1] The aetiology of dentinal hypersensitivity is multifactorial. Its causes are aggressive or incorrect tooth brushing, overconsumption of acidic food, tooth grinding due to stress and parafunctional behaviours, periodontal diseases, external teeth bleaching etc.[2,3] Dental professionals have a variety of regimens to manage patient's dentinal hypersensitivity, including both in-office treatments and patient-applied products for home use.[4]To date research have been concentrated on the hydrodynamic theory of dentinal hypersensitivity, which proposes that stimulus transmission is due to rapid shift of fluid movement in either direction within the dentin tubules stimulating mechano-receptors in or near the pulp.[5,6]

Till date, Potassium nitrate containing dentifrices have proven to be a frequent choice among both patients and dentists for the dentinal hypersensitivity. Potassium ion of potassium nitrate diffuses through the dentinal tubule and reaches the pulp sensory complex and forms a region of greatly increased concentration which subsequently depolarizes the pulp sensory complex and reduces pain transmission.[7-11]

Recently two types of bio-active material are under research to treat dentinal hypersensitivity:

- 10% CPP-ACP
- Novamin

A material 10% CPP-ACP based on the RecaldentTM technology containing amorphous calcium phosphate (ACP) and casein phosphopeptide (CPP), which is obtained from milk casein. The preparation is recommended in hard tissue remineralization. The manufacturer compares the material to liquid enamel. It is generally recommended

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after tooth whitening, scaling, root planning and curettage. It is also recommended in dentin hypersensitivity due to blockage of opened dentinal tubules by calcium and phosphate ions released by 10% CPP-ACP. [12-14]

Novamin(Calcium sodium phosphosilicate) is a bioactive glass in the class of highly biocompatible materials that were originally developed as bone regenerative material. These materials are reactive when exposed to body fluids and deposit hydroxycarbonate apatite, a mineral that is chemically similar to mineral in enamel and dentin. When incorporated into a dentifrice, it releases calcium and phosphate ions leading to its precipitation and the blockage of the dentinal tubules and thus helps in reducing dentinal hypersensitivity. [15,16]

Therefore, the aim of this study was to evaluate the effect of 5% Potassium Nitrate versus 10%CPP-ACP and Novamin containing dentifrice on Dentinal Hypersensitivity using VAS scale.

MATERIALS AND METHOD

Patients between 17-50 age group with non-carious, non-restorable lesions like attrition, dental erosion and pathological dental abrasion were selected with a complain of tooth hypersensitivity. Teeth with cervical carious and restorable lesions, non-carious cervical lesions with pulpal involvement and patients who received professional treatment with desensitizing agents in previous 6 months and those who were under treatment and having any systemic disease/on regular medication were excluded from the study.

Total 75 patients with above mentioned inclusion criteria were equally divided into three groups. Each group contains 25 patients.

Detailed history of the patients were taken. The purpose of a study was explained to the subjects and informed consent were taken. After history, dentinal hypersensitivity scores were recorded by tactile stimuli and by air stimuli on the visual analogue scale (VAS Scale) of 10cm which is a linear scale marked from 0 to 10 to describe the pain experienced.

VISUAL ANALOGUE SCALE:

- 0 No pain
- 1 to 3 - Mild pain
- 4 to 6 Moderate pain
- 7 to 9 Severe pain
- 10 Unbearable pain

For tactile (mechanical) stimuli, a sharp-tipped dental explorer was used perpendicular to the surface of the tooth with slight pressure. For air stimuli, a standard air-water syringe with restricted air stream (45 psi) at environmental temperature was directed towards the sensitive portion of the tooth perpendicular to the long axis of the tooth for duration of 1.0 seconds and at a distance of about 1 cm.

After initial evaluation and recording of the scores, all the subjects were randomly assigned to one of the treatment groups(lottery method).

GROUP 1- 5% Potassium Nitrate Toothpaste (Colgate Sensitive Original, Colgate-Palmolive (India) Ltd, India.)

GROUP 2- 10%CPP-ACP Toothpaste (GC Tooth Mousse, GC Corporation, Tokyo, Japan) GROUP 3-Novamin(Vantej-Dr.Reddy, Hyderabad, India).

For Group 1(5% KNO3) and Group 3(NOVAMIN):Topical application of a pea-sized amount of 5% potassium nitrate or Novamin toothpaste with finger, directly on the hypersensitive surface of each tooth followed by massaging each surface for 1 minute. Patient was instructed not to rinse the dentifrice for 15 minutes. After that sensitivity scores were taken. The subjects were advised to use the dentifrice twice daily with a soft bristle brush at home till 6 weeks.

For Group 2(10% CPP-ACP):The sensitive teeth were isolated with cotton rolls and the thick layer of the 10% CPP-ACP gel was applied on the surfaces with finger, and left for 3 minutes. Then, the patient was instructed to massage the rest of the foam on the teeth with the tongue for 1-2 minutes, without swallowing and spitting out, then to expectorate thoroughly and if possible avoid rinsing. Any 10% CPP-ACP gel remaining in the mouth can be left to gradually dissipate. They were also forbidden to eat and drink for 30 minutes after 10% CPP-ACP application. After 15 minutes hypersensitivity scores were taken. Patients were instructed to use 10% CPP-ACP gel topically each night before retiring along with their conventional dentifrice twice daily for experimental period.

Dentin hypersensitivity response were again evaluated at the end of 4 weeks and 6 weeks by both tactile and air stimuli method by VAS scale.

RESULTS

All the data were subjected to statistical analysis using SPSS software(12.0 version). In present study, Analysis of Variance (ANOVA) test is used for comparison of more than two groups and post hoc test is used for multiple

comparisons. Significance is considered at 5% level.

All the groups caused a significant reduction in dentin hypersensitivity over a period of 4 weeks and 6 weeks. Group 3(Novamin) shows more reduction in dention hypersensitivity than Group 1(KNO3) and Group 2(CPP-ACP).There was no significant difference found between Group 1 and Group 2 but there was a significant difference was found between Group 1 and Group 3 and Group 2 and Group 3.

DISCUSSION

Dentinal hypersensitivity is an exaggerated response to non-noxious and noxious stimuli.[17]Hypersensitive dentine affects between 10-20 % of the population.[18,19] It is a relatively common and significant dental problem which can be successfully managed by medicament containing dentifrices, various types of restorations, iontophoresis, laser etc.20Toothpastes are the most widely used dentifrices for delivering over-the-counter desensitizing agents. These are considered to be the simplest, cost-effective, and efficacious first line of treatment for most patients.[21]

According to the previous literature, the most effective desensitizing toothpaste ingredient is potassium nitrate. Potassium nitrate acts in two ways as a desensitizing agent:

1. Decreasing fluid flow through the tubules by occluding (clogging) them.

2. Decreasing the level of activity of the dental sensory nerves, thus preventing the pain signals to be transmitted to the central nervous system. Potassium ion of potassium nitrate diffuses through the dentinal tubule and reaches the pulp-sensory complex and forms a region of greatly increased concentration (with K + ions) which subsequently depolarizes the pulpal sensory complex and reduces pain transmission. Till date, KNO3 is considered as a gold standard for treatment of dentin hypersensitivity.[21,22]

10% CPP-ACP(GC Tooth Mousse) exerts a rapid desensitizing effect through immediate protein binding after its application on the tooth surface followed by the deposition of calcium and phosphate compounds forming the mineral plugs within exposed dentine tubules. Casein phosphopeptide (CPP) is a milk derived protein able to bind calcium and phosphate ions and stabilize them as amorphous calcium phosphate (ACP).13 10% CPP-ACP complexes make a strong binding with a biofilm on teeth and form a calcium and phosphate reservoir. They are then incorporated into the surface of enamel and dentin. Thus, the medicine restores the mineral balance by strengthening hard tissues, reveals an anti-carious potential, and acts synergistically with fluorine.[13,14]

Physical occlusion of NovaMin particles begins when the material is subjected to an aqueous environment .Sodium ions (Na+) in the particles immediately begin to exchange with hydrogen cations (H+ or H3O+). This rapid release of ions allows calcium(Ca+) ions in the particle structure, as well as phosphate (PO43) ions to be released from the material. A localized, transient increase in pH occurs during the initial exposure of the material due to the release of sodium. This increase in pH helps to precipitate the calcium and phosphate ions from the Novamin particle, along with calcium and phosphorus found in saliva, to form a calcium phosphate (Ca-P)layer. As the particle reactions continue and the deposition of calcium and phosphorus complexes continue, this layer crystallizes into hydroxycarbonate apatite which is chemically and structurally equivalent to biological apatite. The combination of the residual Novamin particles and the hydroxycarbonate apatite layer results in the physical occlusion of dentinal tubules, which will relieve hypersensitivity.[15,16]

In this study, the patients in the age group of 17-50 years were included because studies have shown that most affected patients with dental hypersensitivity are in same age interval, with a peak between 30-40 years of age.[20] Two types of stimuli, mechanical (tactile) and air were used to avoid doubts in sensitivity scoring caused by dehydration induced by the air current.

Pain is a subjective experience in which perception is based on range of variables, including: individual personality, psychological factors, degree of fear or anxiety, cultural factors, social influences and educational level.[10] Pain associated with Dentinal Hypersensitivity has been difficult to quantify and reproduce. [11] Various methods for subjective evaluation of pain are described such as verbal rating scale (VRS), visual analog scale (VAS) and McGill Questionnaire. VAS is very practical and useful in human clinical and psychological research to assess subjective states. But this scale does not allow distinguishing between sensory and efferent components of pain.[23]

The results of this study are in comparable to the study of LJ Walsh showed that in both the CPP-ACP and

KN03 groups, when compared with their relevant baseline values, cervical dentin hypersensitivity scores were reduced significantly at 4wk (on average by 46.9% and 46.8%, respectively) and at 6wk (by 56.8 and 64.4%, respectively), when assessed using a repeated measures.[8]

Marini I, who evaluated the effectiveness of dentifrices containing novamin in the treatment of dentin hypersensitivity Results of this double blinded study showed that the novamin containing dentifrice has the ability to significantly reduce dentin hypersensitivity with noticeable and statistically significant reduction at 1,2,3 and 4 weeks compared to placebo dentifrice.[24]

CONCLUSION

Within the limitation of this study, both the 10% CPP-ACP and Novamin containing dentifrices reduces the dentinal hypersensitivity as that of 5% Potassium nitrate containing dentifrice but through a different mechanism of action by blocking the dentinal tubules. Future studies are warranted in order to evaluate whether the effect of 10% CPP-ACP, Novamin or 5% Potassium nitrate remains after stoppage of its use for a longer period of time.

Figures:

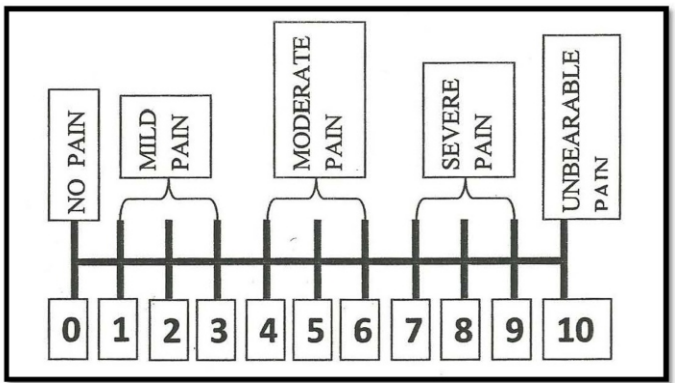

Fig 1: Vas scale of 10 cm for subjective pain assessment

Fig 2: Application of mechanical stimuli

Fig 3: Application of air stimuli

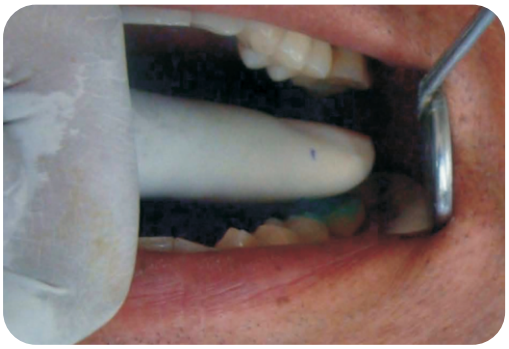

Fig 4: Application of 5% KNO3

Fig 5: After application of GC tooth mousse

Fig 6: Application of Novamin

Tables:

Table 1 : Mechanical stimuli (Comparison between groups)

Time	Group (n=25 in each group)	Mean	Std. Deviation	P-VALUE
Baseline	1(KNO3)	4.3048	1.51858	.000**
	2(CPP-ACP)	3.6372	2.14913	
	3(NOVAMIN)	1.9048	1.18106	
	Total	3.2823	1.93264	
15 minutes	1(KNO3)	3.9648	1.65129	.000**
	2(CPP-ACP)	3.3112	2.06172	
	3(NOVAMIN)	1.5612	1.18650	
	Total	2.9457	1.93988	
4 weeks	1(KNO3)	2.9188	1.87004	.000**
	2(CPP-ACP)	2.0724	1.50628	
	3(NOVAMIN)	.7612	.95945	
	Total	1.9175	1.72253	
6 weeks	1(KNO3)	3.1612	2.47758	.000**
	2(CPP-ACP)	2.4956	2.47261	
	3(NOVAMIN)	.1264	.26348	
	Total	1.9277	2.39068	

* indicates significance at 5%

** indicates significance at 1%

Table 2:Mechanical stimuli Comparison between time periods (Post Hoc test LSD)

Group	A	B	p-value
1	Baseline	15 minutes	0.452
		4 weeks	0.006**
		6 weeks	0.055
	15 minutes	4 weeks	0.041*
		6 weeks	0.184
	4 weeks	6 weeks	0.698
2	Baseline	15 minutes	0.587
	4 weeks	0.004**	
		6 weeks	0.088
	15 minutes	4 weeks	0.019*
		6 weeks	0.211
	4 weeks	6 weeks	0.468
3	Baseline	15 minutes	0.310
		4 weeks	0.000**
		6 weeks	0.000**
	15 minutes	4 weeks	0.012*
		6 weeks	0.000**
	4 weeks	6 weeks	0.003**

* indicates significance at 5%

** indicates significance at 1%

Table 3 : Air stimuli
Comparison between groups

Time	Group (n=25 in each group)	Mean	Std. Deviation	p-value
Baseline	1(KNO3)	4.2148	1.64366	.000**
	2(CPP-ACP)	5.1196	2.30563	
	3(NOVAMIN)	1.6080	.72682	
	Total	3.6475	2.24003	
15 minutes	1(KNO3)	4.9680	1.16823	.000**
	2(CPP-ACP)	4.3476	2.26295	
	3(NOVAMIN)	2.0280	.90945	
	Total	3.7812	1.99859	
4 weeks	1(KNO3)	2.9388	2.64756	.001**
	2(CPP-ACP)	2.8404	2.13430	
	3(NOVAMIN)	.8732	.78520	
	Total	2.2175	2.20637	6
weeks	1(KNO3)	2.2848	2.28206	.000**
	2(CPP-ACP)	3.2568	2.12439	
	3(NOVAMIN)	.3532	.44442	
	Total	1.9649	2.16627	

* indicates significance at 5%

** indicates significance at 1%

Table 4:Air stimuli
Comparison between time periods
(Post Hoc test LSD)

1	Baseline	15 minutes	0.068
		4 weeks	0.046*
		6 weeks	0.001**
	15 minutes	4 weeks	0.001**
		6 weeks	0.000**
	4 weeks	6 weeks	0.354
2	Baseline	15 minutes	0.238
		4 weeks	0.001**
		6 weeks	0.005**
	15 minutes	4 weeks	0.019*
		6 weeks	0.085
	4 weeks	6 weeks	0.493
3	Baseline	15 minutes	0.078
		4 weeks	0.001**
		6 weeks	0.000**
	15 minutes	4 weeks	0.000**
		6 weeks	0.000**
	4 weeks	6 weeks	0.006**

* indicates significance at 5%

** indicates significance at 1%

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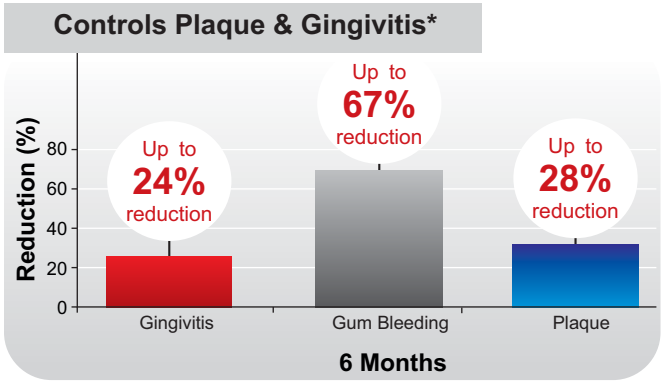

* Vs a control mouth rinse, Donald R Allen et al. Compend, 19: 20-26, 1998.

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