



TRIVANDRUM DENTAL JOURNAL

JOURNAL OF INDIAN DENTAL ASSOCIATION TRIVANDRUM BRANCH

January - June 2017

Volume - 7, Issue - 1

Cleidocranial dysplasia : A case report

Craniofacial fibrous dysplasia : A case report

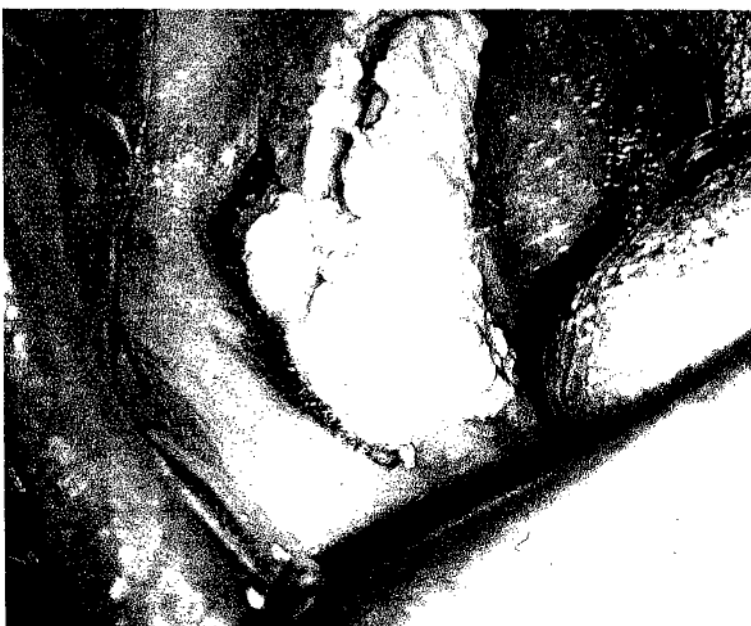
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VOLUME - 7 , ISSUE - 1

CONTENTS

EDITORIAL

4

Scientific journals: Print to E- Journals

Vivek .V

CASE REPORTS

Cleidocranial dysplasia : A case report 5

Soumya R Potti, Vivek V, Sunila Thomas, Jincy Thomas, Ramesh S

Craniofacial fibrous dysplasia : A case report 9

Sruthy C S, Vivek V, Sunila Thomas, Jincy Thomas, Ramesh S

Down syndrome : Report of 3 cases and review 13

Anjali Subramony, Vivek V, Sunila Thomas, Jincy Thomas, Ramesh S

Fibrolipoma on the alveolar ridge : A case report 18

Deena C Thomas, Vivek V, Sunila Thomas, Jincy Thomas, Ramesh S

REVIEW

D Dentistry : Distributing dental health to the undelivered 22

Abdul Salam T.A., Deepan Kumar C.V, Daniel Sunitha Mariam, Ranjana Ravindran

Flexible denture resins - A new revolution in denture construction 28

Sheeba H. Gladstone, Noxy George Manjuran

Transposition of teeth - A review 32

Shaniya Sain, Reshmi J, Anandaraj S, Sageena George, Jyoti Sumi Issac, Sheen Ann John

ABOUT THE JOURNAL 37

EDITORIAL

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The progress of science since time immemorial is brought about by reporting new research, which nowadays is achieved through periodic scientific journal publications. With a view to maintain the quality and validity of the research several scientific journals have designed a rigorous peer review process strictly honouring international copy rights norms. The first peer reviewed journal was believed to be published in 1665, ever since; most journals were published in paper. Micro films were considered a viable alternative to paper for publishing scientific journals from the first half of the twentieth century until the 1980s. With wide spread use of computers CDs offered lot of potential in the initial 1980s. With improvement in access to computers and network distribution, by 1990, several systems like email, file transfer protocol [FTP], UseNet (News Net) propitiatory systems (including Gopher) came to be used for information sharing and publishing. Mid 1990 saw the rise of WWW [the world wide web] and by the mid 1990 commercial distribution of electronic journals by publishers and several free open access journals started via the WWW on a large scale. Thus scientific journal publication originally started in print on paper format, later came to be published in electronic format too, as e-journals or electronic journals. Print and electronic versions of scientific journals are essentially different formats, with each having definite advantages and disadvantages. Presently electronic journals have an edge over print journals from the point of view of users considering cost, access, storage and retrieval of published scientific matter. In spite of the edge, which the e- journal has over the print, the print format of scientific journal is here to stay for some more time.

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CASE REPORT**Cleidocranial dysplasia : A case report**Soumya R Potti¹, Vivek V², Sunila Thomas³, Jincy Thomas⁴, Ramesh S⁵**ABSTRACT**

Cleidocranial dysplasia (CCD) first reported by Martin in 1765 as cleidocranial dysostosis, is a developmental anomaly affecting the skeleton and teeth. Marie and Sinton in 1898 first described the syndrome as a rare developmental condition in which aplasia of clavicles, exaggerated development of the transverse diameter of cranium, delayed closure of fontanelles and disorders of jaws and dentition were the pathognomonic features. Delayed exfoliation of primary teeth and delayed eruption of permanent teeth, with multiple impacted supernumeraries are the common dental manifestations for which the patient approaches a dentist. Hence dentist plays an important role in diagnosis and management of patients with CCD. A case report of 13 year old patient who reported to our department with a complaint of retention of deciduous teeth, who was diagnosed to have cleidocranial dysplasia is presented.

KEY WORDSKey words : Marie and Sinton Disease, *RUNX2* gene, Clavicular agenesis**Introduction**

Cleidocranial Dysplasia also known as Marie and Sinton Disease, Scheuthauer Marie-Sinton syndrome and mutational dysostosis is a rare congenital defect of autosomal dominant inheritance which may even occur spontaneously with no apparent genetic cause⁴. It is associated with a spontaneous mutation in the gene coding for osteoblast transcription factor i.e. runt related transcription factor 2 (*RUNX2*) gene located on chromosome 6p21, which is associated with osteoblasts and dental cell differentiation^{2,5}. Cleidocranial dysplasia is characterized by generalized dysplasia of

osseous and dental tissue causing clavicular hypoplasia or agenesis, which allows approximation of the shoulders in front of the chest, delayed ossification of the skull, underdeveloped maxilla and paranasal sinuses^{6,7}. Involvement of the facial bones, altered eruption patterns and multiple supernumerary teeth makes this condition significant to dental practice. A case report of cleidocranial dysplasia in a male patient, who was found to have familial history of this syndrome, is presented.

Case report

A 13-year-old male patient presented at the Department of Oral Medicine & Radiology complaining of retained deciduous teeth in upper and lower arch. On general examination patient had short stature. He had drooping shoulders and was able to move shoulders in front of chest. On examination the clavicles were not palpable.

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Extraoral examination revealed frontal bossing with central depression in the frontal region. He had a concave facial profile with a depressed nasal bridge. Hypertelorism was noted. On further examination, it was noted that the mother of the patient was having the same features as that of the child. She reported that she had the same dental condition as that of the child & underwent extraction of her deciduous teeth for eruption of the permanent ones. She had drooping shoulders and on palpation she had a hypoplastic clavicle.



Fig 1. Extraoral photograph of the patient and his mother showing frontal bossing, depressed nasal bridge & hypertelorism.



Fig 2. Photograph depicting approximation of shoulder in front of the chest

Intraoral examination of the patient revealed a high arched palate. There were multiple retained deciduous teeth; 51,52,53,54, 55,61, 62,63,64,65,73, 74, 75, 83,84&85 with only permanent mandibular central incisors,

right mandibular lateral incisors and first molars on maxillary and mandibular arch erupted.

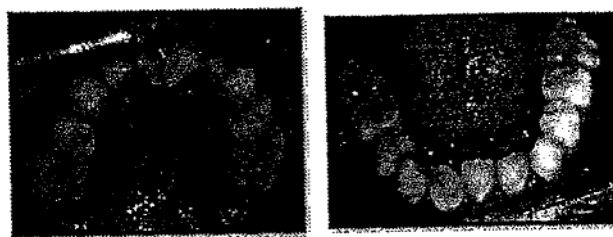


Fig 3. Intraoral photograph of the patient showing multiple retained deciduous teeth.

After clinical examination; orthopantomogram (OPG), chest X-ray and posteroanterior (PA) skull and lateral Ceph radiographs were advised. OPG showed that the permanent tooth except the molars were impacted in maxillary arch and in the mandibular arch canines & both the first and second premolars on left and right side were impacted. The lateral incisor on left side was also impacted and there was presence of supernumerary teeth on left side between the central incisor and unerupted lateral incisor. The PA view showed open anterior fontanelles. The lateral skull radiograph clearly depicted the hypoplastic maxilla and paranasal sinuses and his concave facial profile. The chest x ray clearly depicted agenesis of clavicles bilaterally.

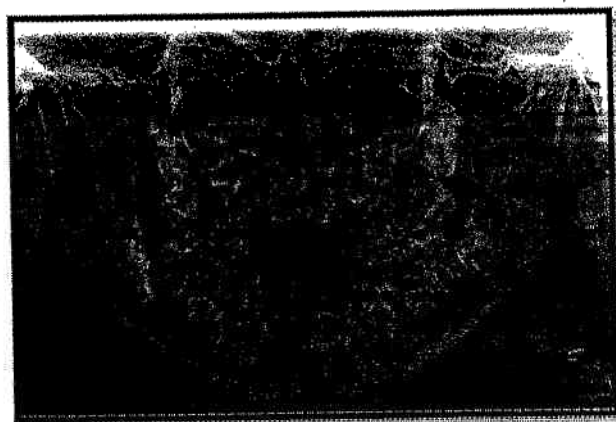


Fig 4. OPG showing multiple retained deciduous teeth, impacted permanent teeth and supernumerary teeth.



Fig 5. PA skull view depicting open anterior fontanelles & Lat. Ceph. depicting hypoplastic maxilla and frontal bossing.



Fig 6. Chest X ray depicting agenesis of clavicle and narrow thoracic cage.

Discussion

CCD transmitted by autosomal dominant mode of inheritance is a rare disease with high penetrance and has variable expressivity^{1,3,6}. It occurs in 1 per million live births. CCD is associated with spontaneous mutation in RUNX 2 which belongs to runt domain gene family, is also known as OSH2, Cbfa1, PEBP2aA, AML-3². Point mutation involving RUNX 2 gene was noted in 70% of cases with CCD, 13% cases showed deletion⁷. 40% of CCD may occur sporadically without any specific genetic cause⁴. RUNX2 is gene coding for osteoblast transcription and is associated with differentiation of precursor cells into osteoblast. According to Zhou et al. In 1999 this differentiation is essential for membranous and endochondral ossifications¹.

Although generalized skeletal involvement is noted, according to study proposed by Gorlin et al. in 2001 midline osseous structures were found to be primarily involved¹. The clavicles are the most commonly affected bone as they are the first bone to ossify. Clavicles may be either hypoplastic or absent. In 10% of cases clavicles may be absent and if unilateral absence is noted it is usually on the right side. In odontogenesis the epithelial mesenchymal interactions that help in progress of morphogenesis and histodifferentiation of epithelial enamel organs are affected by the RUNX2 gene⁴.

In a patient with CCD classical triad of cranial abnormality, clavicular involvement and pelvic anomalies may be noted. A clinical diagnosis may be made at time of birth due to presence of soft cranium but often remain undiagnosed until short stature and wide open anterior fontanelles and sutures causes concern to the guardians⁸. CCD may be diagnosed by eliciting the family history, observing the excessive mobility of shoulders and by identifying the pathognomonic clinical and radiographic features occurring in the chest, skull and jaws⁹.

The striking clinical features noted in CCD are brachycephaly and frontal bossing. The patient may present with open fontanelle in adulthood or there might be delayed closure of the same. Presence of hypertelorism and flat nasal bridge are the pathognomonic signs of CCD¹⁰. The shoulder appears narrow and drooping with complete or partial absence of clavicles. The thoracic cage is bell or funnel shaped and small which may cause respiratory distress in children^{8,11}. There will be retention of deciduous teeth with delayed eruption or impaction of permanent teeth. There may also be presence of large number of unerupted supernumerary teeth. The maxilla is often

underdeveloped with ill formed or aplasia of paranasal sinus leading to a concave facial profile¹⁰.

The management of CCD includes orthopaedic correction of dislocation of joints if occurs, calcium and vitamin D supplementation for people with low bone density¹⁰. Measures must be taken to combine orthodontic and surgical treatment for timely extraction of deciduous teeth and any supernumerary teeth, exposure and orthodontic assisted eruption of impacted permanent teeth¹². Genetic counselling must be provided to young adults as the subsequent generations of individual with CCD are prone to inherit the disease¹¹.

Conclusion

Dentist plays an important role in diagnosis and treatment of CCD. Management of CCD requires a multidisciplinary approach and for better prognosis the treatment should be initiated as early as possible. It is the role of the dentist to treat the aesthetic and functional problems that these patients face. Hence dental treatment should be aimed at providing the patient a well-functional permanent dentition, an esthetic facial appearance and relieve the patient by psychological support and motivation.

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CASE REPORT**Craniofacial fibrous dysplasia : A case report****Sruthy C S¹, Vivek V², Sunila Thomas³, Jincy Thomas⁴, Ramesh S⁵****ABSTRACT**

Fibrous dysplasia was first described by Lichtenstein in 1938, is a slowly progressing benign skeletal anomaly where normal bone is replaced by fibro-osseous tissue. Etiology is mutation of GNAS1 gene. Mainly affect children and young adults but can be found at any age. Painless hard swelling is the common clinical finding. Other features include pathologic fracture of involved bone, proptosis, loss of vision, headache etc. This may be associated with cutaneous and endocrine abnormalities. Case report of a 22 year old male patient who was diagnosed with craniofacial fibrous dysplasia is presented.

KEY WORDS

Key words : Fibrous dysplasia, fibro-osseous lesion, GNAS1 gene

Introduction

Fibrous dysplasia is a benign skeletal developmental anomaly, characterised by replacement of normal bone by fibro-osseous connective tissue. This has a slow progression rate and is non hereditary. Mutation in GNAS 1 [Guanine Nucleotide binding protein, a stimulating activity polypeptide 1] gene is believed to be etiologic factor for fibrous dysplasia.¹ Cutaneous and endocrine effects may also be noted.² Age of occurrence may range from 10-72 years.² But it usually occurs within the first two decades of life.³ No sex predilection is noted.⁴

Monostotic fibrous dysplasia shows involvement of only one bone usually rib, long bones, craniofacial bones etc while polyostotic involves several bones involving skull, facial bones, pelvis, spine etc.^{1,5} Craniofacial form of fibrous dysplasia is seen in 10-25% of cases in monostotic and 50% cases in polyostotic. This may be symptomatic or asymptomatic based on location.⁶ "Café-au-lait" pigmentation may be seen associated with polyostotic fibrous dysplasia. This case report describes a case of swelling in relation to right maxillary region which was diagnosed as a case of fibrous dysplasia.

Case report

A 22 year old male patient came to the department of oral medicine and radiology with a complaint of missing upper front teeth and wants replacement with fixed prosthesis. He also gives a history of trauma about 4 years back and resultant tooth loss at that time. No history of any systemic diseases reported.

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On extraoral examination, facial asymmetry noted on the right side of face. A diffuse swelling seen extending from the region of zygomatic bone superiorly to lower border of mandible inferiorly. Size of nose is slightly enlarged on right side. Slight obliteration of right nasolabial fold is noted. On palpation swelling is hard and nontender.



Fig 1. Extraoral photograph of patient showing facial asymmetry on right side

On intraoral examination, a discrete pinkish white colored dome shaped swelling measuring about 7*5cm size seen extending from 13 region to 16 region. No drifting of teeth noted. No missing/unerupted teeth. On palpation swelling is firm in consistency and nontender. Teeth are in occlusion. No impairment of vision noted. Based on clinical features a provisional diagnosis of fibrous dysplasia was made.

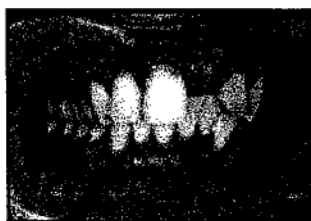


Fig 2. Proper occlusion is demonstrated



Fig 3. Swelling noted on the right maxilla

Radiologic investigations including panoramic radiograph, PA cephalogram, CT scan was done. Panoramic view shows diffuse increase in radio opacity affecting mandible,

maxilla and maxillary sinus on right side. Expansion of lower border of mandible on right side is noted. PA cephalometric image shows asymmetry on right side with expansion of mandible. Radiopacity of left nasal fossa was noted. CT Scan revealed a diffuse increase in bone density affecting maxilla, mandible, and sphenoid bone.



Fig 4. Panoramic view showing diffuse increase in radiopacity of maxilla, mandible and maxillary sinus. Expansion of lower border of mandible noted.

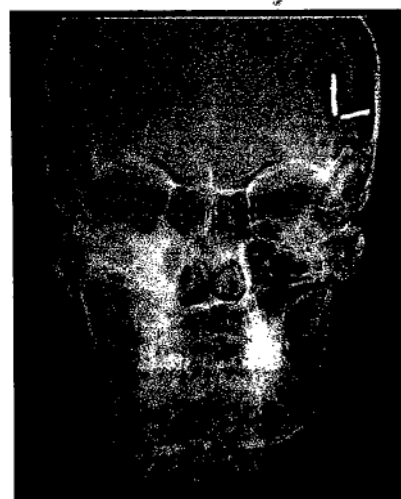


Fig 5. PA cephalogram showing asymmetry on right side

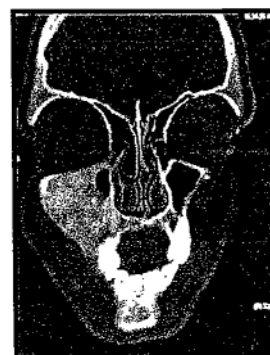


Fig 6. CT-Coronal view showing diffuse increase in radiopacity affecting right side of maxilla and maxillary sinus

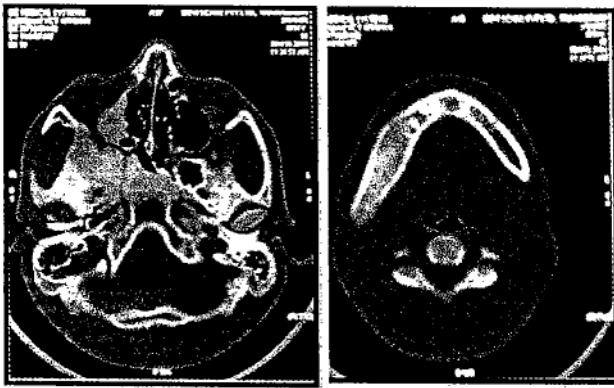


Fig 7. Axial CT showing involvement of maxilla, maxillary sinus, sphenoid bone and mandible

Final diagnosis was fibrous dysplasia affecting maxilla, mandible and sphenoid bone on right side. As patient was asymptomatic he was advised about cosmetic correction.

Discussion

Fibrous dysplasia[FD] is a benign fibro-osseous disorder which affects long bones of extremities femur, tibia, humerus, radius, bones of skull, pelvic bone, ribs and phalanges. It is usually unilateral in occurrence.³ Fibrous dysplasia was first described by Lichtenstein in 1938.⁷ Incidence rate is 2.5% to 10% of all bone tumours.⁷

Etiologic factor for fibrous dysplasia is GNAS 1 gene mutation. This may affect melanocytes and endocrine cells in addition to osteoblast precursors.² FD usually occurs in the first two decades of life. Common clinical finding is asymptomatic enlargement of involved bone.⁸ But pain is a common symptom in extracranial FD. Involvement of sphenoid bone may compress optic nerve and can result in loss of vision.⁷

Based on review of 24 cases by Firat and Stutzman craniofacial lesions are mainly osteosclerotic while other areas show cyst like lesion.⁹ Radiographic appearance can be lytic/mixed/sclerotic.⁶ CT Scan can provide accurate bony details and exact extent of lesion.⁶ Resultant image may show ground glass

pattern [56%], homogenous dense pattern [23%], cystic variety [21%].⁷ In MRI scan there will be decreased signal intensity in both T_1 and T_2 weighted images, with well demarcated borders. Bone scintigraphy is used to assess the areas of distribution and to rule out metastasis.¹⁰ Histopathologic examination is considered as the gold standard for diagnosis of FD and definite diagnosis is based on radiographic findings.¹⁰

In a study by Harold E. Ramsay on fibrous dysplasia of craniofacial bones, it was found that out of 29 patients reviewed only 1 had slight elevation of serum alkaline phosphatase level and only three showed slight rise in calcium level.⁴

Malignant transformation is very rare in FD. This is manifested by sudden enlargement or onset of pain in a long standing quiescent lesion. Risk of malignant transformation is only less than 1% in monostotic and 4%-6.7% in polyostotic form.¹⁰

Medical management includes use of bisphosphonate and steroid.⁷ Surgical method is preferred when a cosmetic or functional correction is required. This includes shaving/contouring or radical excision.⁷ According to Harold Ramsay complete resection of involved bone is the most successful method than curettage, as it shows less amount of recurrence. But this can result in disfigurement.

Conclusion

Although fibrous dysplasia is considered as a benign fibro-osseous lesion, there is a risk for malignant transformation. So regular follow up is indicated and a multidisciplinary approach is needed for management of fibrous dysplasia.

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CASE REPORT

Down syndrome : Report of 3 cases and reviewAnjali Subramony¹, Vivek V², Sunila Thomas³, Jincy Thomas⁴, Ramesh S⁵**ABSTRACT:**

Down syndrome (DS) is a readily recognized congenital, autosomal anomaly presented with central growth deficiency along with generalized physical and mental deficiencies. DS is the commonest autosomal chromosomal anomaly among humans with an incidence rate of 1 in 600 - 1000 live births among all racial and ethnic groups. The extra genetic material present causes delay in the development of child, both physically and mentally. Patients with Down syndrome commonly present with significant dental problems such as retention of multiple deciduous teeth, periodontitis, delay in eruption of permanent teeth, impacted teeth and so on. 3 cases of Down syndrome which came with classical signs, is presented along with a review of literature.

KEY WORDS

Key words: Down syndrome, Trisomy 21, Acromicria syndrome

Introduction

Down syndrome (DS) is defined as a genetic disorder induced by the presence of complete or a part of a third copy of chromosome 21.² Down syndrome is the most common chromosomal abnormality in humans. John Langdon Down, the British physician first described the syndrome in 1866. DS is primarily caused due to trisomy as reported by Lejeune et al in 1959². The syndrome is also known as Trisomy 21 and Acromicria syndrome. DS is not a disease entity

by itself, but affected individuals have higher risk of acquiring many systemic conditions.⁴ Genetic complexity and phenotype variability is the hallmark.³

Three cytogenic variants leads to Down Syndrome,³

- (1) *Trisomy 21*
- (2) *Translocation*
- (3) *Mosaicism*

Trisomy 21 accounts for 94% of all patients with DS. In this an extra 21 chromosome produces a complement of 47 chromosomes. Trisomy 21 is synonymously referred to as Trisomy G. Another variant, translocation (5%) in which there appear to have only 46 chromosomes, the extra chromosomal material of 21 is translocated to another chromosome of G or D group, either 21/22 translocation. Third type, accounts for 1%, with non-disjunction at

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a later stage of cell division. Some cells have the normal complement of 46 chromosomes and other cells 47 chromosomes (with an extra 21 chromosome)

Case report 1

A 4.5yr old female patient who reported with a chief complaint of multiple decayed tooth on upper front region since 2years, with no history of pain. Patient had undergone chromosome analysis 2yrs back. GTG banded karyotype shows-47,XX+21 pattern. She is the second child of her parents. Motor milestones were delayed. She had most of the common dysmorphic features of DS like short palpebral fissures, epicanthic folds of the eyelid causing almond shaped eyes, mongoloid slant, hypertelorism and depressed nasal bridge. The patient also presented with a short neck, small hands and feet, deep crease in the palm which is a, single palmar fold known as Simian crease and had poor muscle tone. The patient also had excessive space between first and second toe. No cardiac defects reported. Speech was not fluent. No relevant family history reported. Her medical history was unremarkable and was not on any medication. The facial profile showed a flat face with an upward slant of the eye and short palpebral fissure. (Fig. 1)



Fig. 1(a)



Fig. 1(b)



Fig. 1(c)



Fig. 1(d)



Fig. 1(e)

Fig 1(a & b) shows extraoral features like frontal bossing, flat occiput, depressed nasal bridge & protruding tongue.

Fig 1(c,d & e) shows simian crease, wide gap between first & second toe and intraoral view respectively

Case report 2

A male patient aged 8 years came with a chief complaint of decayed tooth on upper and lower front region since 3 years. Patient was conscious and cooperative. He was a diagnosed case of trisomy 21 with moderate patent ductus arteriosus (PDA), mild pulmonary artery hypertension (PAH), and aspiration pneumonia. Also gives a history of cardiac surgery before 7 years. Milestones were delayed. Speech was not fluent and he was not able to write.

On extraoral examination, frontal bossing, hypertelorism and depressed nasal bone were noted. Intraorally, generalized enamel hypoplasia, palatally placed teeth 21 and multiple caries teeth and root stumps were noted with high arched palate and angular cheilitis. (Fig. 2)



Fig. 2(a)



Fig. 2(b)



Fig. 2(c)



Fig. 2(d)



Fig. 2(e)

Fig 2(a & b) shows short palpebral fissure, hypertelorism and almond shaped eyes.

Fig 2(c, d & e) shows palatally placed 21, dry scaly skin and angular cheilitis respectively

Case report 3

A 12 year old male patient for dental treatment with a complaint of mobility of upper anterior teeth for past 8 months. History and reports revealed that the patient had atrial septal defect, Down syndrome and hypothyroidism and

was not under any medication. On clinical examination, all the classical signs of DS were noted. Intraoral examination shows retained 52 & 53, palatally erupting 12, unerupted 13. Macroglossia, high arched palate and enamel hypoplasia were also noted. (Fig. 3)

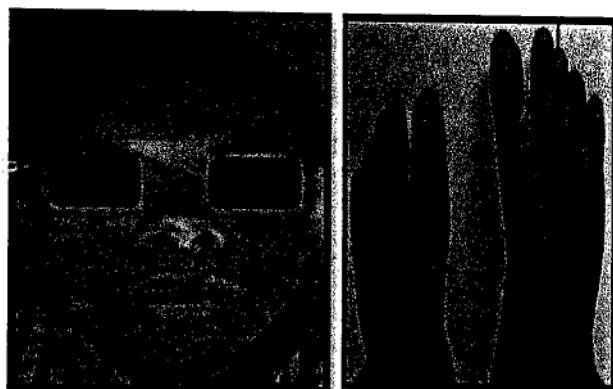


Fig. 3(a)

Fig. 3(b)

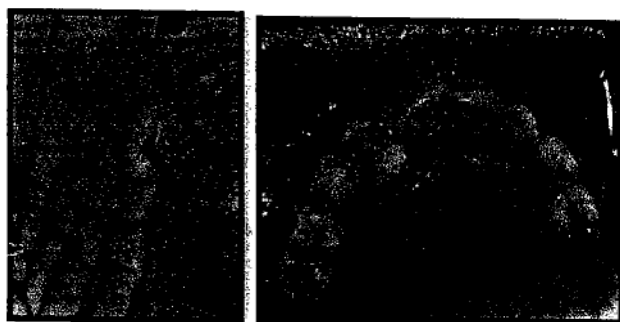


Fig. 3(c)

Fig. 3(d)

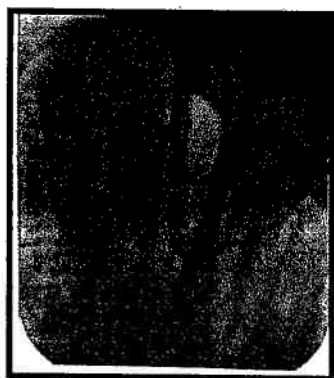


Fig. 3(e)

Fig 3(a, b & c) shows extraoral features like broad nose, hypertelorism, wide gap between first & second toe and simian crease respectively

Fig 3(d, e) represent the retained 52 & 53 intraorally and radiographically

Discussion

Down syndrome is a condition, which is precipitated due to the trisomy of human chromosome 21 (Hsa21)³. The physical and mental changes are attributed by the neotenzation of brain and bodies.¹ The most common cause of mongoloid babies is the existence of an extra copy of chromosome 21 which results in trisomy. The other reasons can be Robertsonian translocation and the presence of ring chromosome (isochromosome). 21q22 was believed to be the "critical location". Axial instability, craniofacial abnormalities, congenital heart defects of the arterioventricular cushions, clinodactyly of the fifth finger were the main features.³ The presence of unique combination of skeletal and facial features like short neck, frontal bossing, brachycephaly, flat occiput, open mouth along with ocular malformations like hypertelorism, speckling of the iris (Brushfield's spots), bi or unilateral strabismus, narrow palpebral fissures and outward slanting almond shaped eyes gives a typical "Mongoloid Idiotic appearance"³. The cardinal skeletal feature of persons with DS is midface dysplasia, along with poorly developed paranasal sinuses which gives a sloping forehead and flat facies.

Peculiar scrotal large tongue with crenations noted gives a pseudo macroglossic effect. Common malocclusion seen in DS are prognathic mandible which gives a skeletal class 3 appearance. Anterior open bite, spacing, delayed eruption, multiple missing and impacted teeth are attributed by mouth breathing habit. Bruxism, dysfunction of TMJ, improper oral hygiene maintenance, characteristic tongue thrust are the other features of DS.

As DS individuals have poor oral hygiene, marginal gingival inflammation, acute and subacute necrotizing gingivitis, chronic periodontitis with gingival recession and increased pocket depth, alveolar bone loss, furcation involvement, tooth mobility and tooth

loss may occur. On the other hand, the prevalence of dental caries is very low in both primary and permanent dentitions.

In DS, gross motor skills are superior to fine motor skills and has reduced prevalence of hypertension, increased risk of congenital heart diseases (50%) and gastrointestinal problems like duodenal stenosis (DST) and imperforate anus (IA).³

Sleep disorder like obstructive sleep apnea is common in DS (50%). Obsessional slowing and compulsive behaviours has been noted as behavioral presentations of some patients with Down syndrome⁹. With the recent advances in medical treatment, better living conditions, better health care and highly sophisticated surgical techniques, long-term survival is also improving.³

Diagnostic Modalities

High risk pregnant ladies, over the age of 35 years or more must undergo prenatal testing for Down syndrome which includes, blood screening for maternal serum alpha-fetoprotein (MSAFP), human chorionic gonadotropin, unconjugated oestriol (uE3). Evaluation of fetal cells from amniotic fluid (amniocentesis) can be carried out during 14th -18th week. Chorionic villus sampling is also another valuable diagnostic modality which can be done on 9-11 weeks period. For confirmation, chromosomal karyotyping and percutaneous umbilical blood sampling (PUBS) can be performed. Among them, PUBS is the most accurate method to confirm the results of CVS or amniocentesis. Even though it has high accuracy rates of 98-99%, PUBS cannot be performed until later stages (8th-22 weeks) because of the highest risk of miscarriages. Fluorescence in situ hybridization (FISH), Quantitative fluorescent polymerase chain reaction (QF-PCR), Paralogous sequence quantification (PSQ) are the current trends in diagnosis.

Differential diagnosis

- Congenital hypothyroidism and Isolated hypotonia presents identical features as DS. However, karyotyping results shows normal set of chromosomes.
- Zellweger syndrome shows similar features, but elevated very long chain fatty acids in plasma is a specific feature in karyotyping.

Management

Clinical signs and symptoms varies from one child to other. Management of DS is a holistic approach. Prompt surgical treatment of cardiac defects during early part of life, congenital cataracts treatment, balance diet and regular exercise are mandatory aspect of treatment. A DS baby must need regular check up from various consultants like geneticist, pediatrician, cardiologist, pneumonologist, ophthalmologist, neurologist, orthopedician, physical and occupational therapist, speech therapist and an audiologist.³

Recent trends in therapy

Enhancement of cognition by pharmacological treatment has become the recent advance in therapy. Improvement of hippocampus based learning was reported after chronic intake of picrotoxin or pentylenetetrazole in Ts65 Dn mouse models, by the reduction in gamma aminobutyric acid-mediated inhibition in hippocampus.

Conclusion

DS individuals are basically a group of patients requiring special oral health care services. The dentist will encounter patients with DS on a daily basis. Therefore, it is very important to be familiar with the medical and dental implications of this condition. A well planned preventive dental health programme started early, can lead to success in prevention of dental diseases associated with Down syndrome.

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CASE REPORT**Fibrolipoma on the alveolar ridge : A case report****Deena C Thomas¹, Vivek V², Sunila Thomas³, Jincy Thomas⁴, Ramesh S⁵****ABSTRACT**

Fibrolipoma is a benign soft tissue tumor and mesenchymal in origin. It is a variant of lipoma which consists of fibrous tissue mixed with lobules of adipose tissue. Most commonly affects the trunks and proximal extremities. The intraoral lipomas are rare. This case report describes a rare and unusual lesion found in a 57 year old female patient, which was diagnosed as fibrolipoma on the left side mandibular alveolar ridge.

KEY WORDS

Keywords: Benign tumor, Lipoma, Fibrolipoma, Alveolar ridge

Introduction

Lipoma is the most common benign soft tissue neoplasm which derived from adipose tissue.¹ It is mesenchymal in origin, which rarely seen in oral cavity. The etiology of lipomas is unknown². The incidence rate of oral lipomas is 1%- 4% of all benign oral tissue tumors⁵. It is commonly seen during 4th and 5th decade of life, with no sex predilection.² Lipomas are commonly seen on trunk region, shoulders, upper arms, and neck, particularly from the subcutaneous tissues in the neck³. The most common site for oral lipomas is the buccal mucosa, followed by the tongue, the floor of mouth, buccal sulcus, palate, lips, and gingiva, alveolar ridge⁴. Histologically lipomas are classified into fibrolipoma, spindle cell lipoma,

intramuscular or infiltrating lipoma, angioliipoma, salivary gland lipoma (sialoliipoma), pleomorphic lipoma, myxoid and atypical lipomas.^{9,5} It is usually present as painless, slow growing⁷, well circumscribed,⁶ nodular swelling⁴, with characteristic yellowish or pink colour, soft and dough feel in the buccal mucosa.² The lipomas are usually solitary lesion that may be sessile, pedunculated and its size is less than 3cm in diameter.⁸

Fibrolipoma is a histological variant of lipoma which contains adipose tissue and abundant amounts of fibrous tissue⁷. It is extremely rare type of lipoma, with incidence rate of 1.6% of all facial lipomas⁴. Extra-oral sites are esophagus, pharynx, colon, trachea, larynx.⁵ Intraorally it can be seen in various sites such as buccal mucosa, lips, tongue, palate, buccal vestibule, floor of the mouth, and retromolar area.⁹ It is usually asymptomatic, slow growing lesion, as the size increases it may cause interference with speech and mastication². A case report which describes the diagnosis and management of an asymptomatic, slowly growing, fibrolipoma on the left alveolar ridge is presented.

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tissue and an overlying epithelium [Fig 5]. Hence after clinicocytopathological correlation, a final diagnosis of fibrolipoma was rendered.

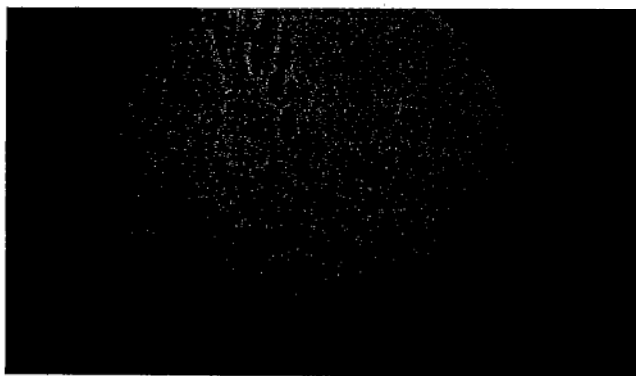


Fig 5: Photomicrograph of lesion

Discussion

Oral lipoma was first described by Roux in 1848 as "yellow epulis" is a benign mesenchymal soft tissue neoplasm of mature adipose tissue.⁸ The prevalence rate is 1 in 5000 adults, 45.7% cases were lipomas and 39.1% were fibrolipomas.⁴ Etiology of lipoma is unclear. The some of the causative factors are trauma, infection, chronic irritation, hormonal imbalance, metaplasia of muscle cells, fatty degeneration.

Fibrolipoma is a microscopic variant of conventional lipoma⁹ which consist of mature adipose tissue interspersed by bands of connective tissue.³ It is rarely occurs in oral and maxillofacial region.³ It tend to occur during 4th and 5th decade of life⁶ and shows a slight predominance among females.⁷ In our case, the lesion was found in 57year old female patient. Most common site are buccal mucosa and buccal vestibule.³ In the present case, the lesion occurred on the alveolar ridge distal to the mandibular left third molar area. Lipomas are <3cm in size⁵. Lipomas usually present as asymptomatic, painless, slow growing, nodular swelling, and soft in consistency.² It is usually seen as a solitary lesion which may be sessile or pedunculated, so as in our case.

The diagnosis of oral lipoma is made by clinical examination, and biopsy. Biopsy is the gold standard method for identification of subtypes of lipomas. Imaging modalities such as magnetic resonance imaging [MRI] and computed tomography [CT] can be used for diagnosis and to determine the extent of lesion.⁴ In this case fibrolipoma was considered. A definitive diagnosis could be made only based on histopathologic examination.

The histological variants of lipomas are fibrolipoma, spindle cell lipoma, intramuscular or infiltrating lipoma, angiolipoma, salivary gland lipoma (sialolipoma), pleomorphic lipoma, myxoid and atypical lipomas. The appearance of lipomas are well encapsulated mass of mature adipose cells, where as in fibrolipoma show blending of fibrous tissues with adipose cells.⁷

Treatment for the lipomas is excision of the lesion. The recurrence rate can be reduced by wide surgical excision.⁷ Its prognosis is good. Long lasting cases may turn into liposarcoma.⁴

Conclusion

Fibrolipoma is a very rare subtype of oral lipoma. Presence of an asymptomatic, slow growing, soft, pedunculated, nodular swelling, in the lower alveolar ridge in a middle aged woman should alert the clinicians of the possibility of fibrolipoma, as in this case. Histopathological examination is the gold standard for confirmatory diagnosis. To avoid recurrence, the patient is still under regular follow up.

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REVIEW

D Dentistry: Distributing dental health to the undelivered

Abdul Salam T.A.¹, Deepan Kumar C.V.², Daniel Sunitha Mariam³, Ranjana Ravindran⁴

ABSTRACT

Dental diseases are a significant public health menace which can substantially impact on the quality of life thereby affecting the daily performance and general life satisfaction. High prevalence of dental diseases can be attributed to barriers such as affordability, availability accessibility, accommodation and acceptability that prevent access to oral healthcare services.

In spite of opportunities that exists to integrate oral health care with general health care, weak political will, less patient awareness and economic factors restricts this noble idea. In this scenario the quality of life of the population can be improved by making attempts to advance through D dentistry. Thus the measures such as D dentistry can help to design a framework for appropriate expansion and improved access to dental care services in India.

KEY WORDS

Keywords: Accessibility, Oral Health Care, Population

Introduction

Dental diseases are a significant public health menace which can substantially impact on the quality of life thereby affecting the daily performance and general life satisfaction. WHO states that the oral health is an integral part of general health. There is a remarkable difference in health status including the oral health between urban and rural population of India.

Caries and periodontal disease has a deteriorating effect on the the individual's health

and wellbeing, thereby decreasing economic productivity, and acting as significant risk factors for other systemic health ailments. The consequences of such widespread poor oral health can be reflected on the person, population and health systems.

Oral problems can cause pain, agony, functional, and aesthetic problems which can lead to the loss of working man-hours. Hence, it indirectly affects our country's economy.

The prevalence of dental diseases, especially oral cancer, worldwide reminds us constantly of the almost universal need for effective dental health¹. Oral precancers and cancers are emerging as a dangerous threat to younger people. Oral cancer is a life threatening condition and the treatment modalities available are expensive and are way beyond the reach of the common person. Prevention and control by public education and motivation is effective to a significant level.

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Appropriate utilization of dental care services in most of the developing nations is still a process subjected to lot of doubts. India is a diverse country comprising of populations that are distinct in health concerns in addition to the diverse cultural and religious beliefs. Methods to improve the access to oral health services need to be thought of and implemented to bring about a change in the perception of the Indian citizens.

Obstacles in utilizing oral health care services in India

The high prevalence of dental diseases can be attributed to barriers that prevent access to oral healthcare services

There are important challenges in being able to utilize oral health care services, namely:

- affordability
- availability
- accessibility
- accommodation
- acceptability

1. Affordability

Poverty is a key social determinant of oral health. A poor oral healthcare requiring behavior of the people in the rural areas may primarily be attributed to the low socio-economic status

2. Availability

Majority of the population live in remote locations that are far distant from any oral health service centers and this makes availability of high-quality oral health care quite difficult for them.

3. Accessibility

We have a range of dental services from single dental unit setups to the most modern multi-chaired exotic clinics, in cities and

metros which constitute urban areas than rural areas, with huge unmet treatment needs. This striking inequality in the delivery system indicates the absence of an adequate community-oriented prevention system. National oral health policy which was drafted in 1985 by Dental Council of India (DCI) has recommended that dentists should be appointed at primary and community health centres. But implementation has not been successful until date. All these factors contribute to less accessibility to dental health care services for the general population, especially the rural ones.

4. Accommodation

The oral health care providers should organize their programs in such a way as to meet the constraints and needs of client populations.

5. Acceptability

Those who seek oral health care should find the services acceptable which can lead to an increased self-reporting tendency among others in the same population.

Dental health measures

The various measures to be studied can be categorized under 10 D's and can be named as **D Dentistry**.

1. Dental Safety nets

Dental safety net providers are public and private non-profit organisations that provide comprehensive oral health care to children, adults and elderly. Dental safety net is defined as "the facilities, providers, and payment programs that supplement dental care specifically for underserved populations.² The underserved includes those whose physical health, age, behavioural, social, language, or geographical conditions limit their access to or acceptance by majority of dentists in private practice, apart from those of the population that are disadvantaged by income. Adequate safety

nets can also rein in health care costs by integrating components of care such as actively screening and enrolling eligible patients, assigning them to a primary care and providing reasonable range of comprehensive care. State funds provide support for most of the dental safety net providers.

2. Dental homes

By definition, dental home is the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health being delivered continuously in a family-centred way.³ The concept of the dental home though well established in the developed countries, should be strategised to implement it well in India. Dental home serves as a repository for records and also as a locus for preventive oral health supervision and emergency care. The existing networks of health care delivery systems in India such as the Integrated Child Development Services Scheme and National Rural Health Mission. These programs are utilized in the three level strategies which also include screening, information regarding basics of dental disease developmental processes and their early active intervention which may help us mitigate the scourge of dental diseases for a large extent in the Indian context. The rural should be educated about the advantages of seeking dental help in early ages of life. The villages and towns can be divided into areas that have their own dental homes, which is capable of providing the basic oral health facilities at much more economic rates than private services.

3. Dental insurance

Dental insurance will prove to be beneficial in expanding the oral health care service in India. Dental insurance provide benefits to the society by ensuring dental treatment at low and affordable cost.

Dental insurance for individuals meeting with road traffic accidents or sport injuries

should be made available. Another special section of the society is the geriatric population who usually require prosthodontic care. Expectant mothers could be provided with cards such as "dentacards" which enable them to undergo 3 monthly subsidized regular dental check-up or treatment.

4. Dental Colleges

a. Rural postings

The need for dental treatment in rural setup with compulsory postings of 3 months backed by the Ministry of Health and Family Affairs has been the top agenda in the last few years. The Dental Council of India had initiated steps to reintroduce internship recently in 2011 and also to make 3 months of rural posting compulsory. Attractive incentives for services in rural areas might help in enabling young dentists to opt for these places. This helps to balance the biased urban-rural skew.

b. Dental research

Dental colleges should promote dental research among underserved population especially among tribal population constituting 8.3% of the nation's total population who are ignorant of the intricate nature of the disease, and for whom the treatment of disease is primarily based on the indigenous sources. A key public health challenge is to determine the health needs of such deprived populations using researches which contribute to large unmet treatment needs among this community such as lack of access to dental health care services at affordable costs⁵. A policy approach to improve the oral health of the tribe would be a policy which allows licensed hygienists to practice as dental therapists with advanced training. Dental hygienists could be a principal component of the solution to the poor oral health status of these people. There can also be a provision of interns, dentists and postgraduate doctors being posted in the tribal areas for certain specific duration which will provide immediate

outcomes. This could be done with the support from the government.

5. Dental Legislations

DCI is a statutory body which is mainly concerned with maintenance of standard of dental education and further. It is the duty of the council to register qualified dentists and eliminate quacks in the field.

All health policy agendas set at local, state and national levels for oral health promotion and care along with disease prevention should have great role. For a change to happen and enhance the nation's overall health and well-being, the public, dental health professionals and government must understand that oral health is equally essential to general health and well-being at every stage of life. In addition, IDA also should take efforts to address the nation's overall health agenda.

6. Dental health programmes

The morbidity, mortality and economic burden associated with oral diseases can be considerably reduced by Dental health programmes like national oral health programme with measures such as interventions aimed at prevention and health promotion that can improve oral health.

National oral health programmes

Vision and Goals to Action

a. The Vision of the Wake-up Call To Action is

- For optimal oral health, acknowledging oral health is a fundamental part of general health and well-being
- Engage in programmes to promote oral health and prevent disease.

b. The Goals of the Call To Action is to

- Promote oral health.
- Improve quality of life.
- Eliminate oral health disparities

c. To Action

- Change perceptions of oral health
- Undertake effective programmes
- Build scientific base and accelerate transfer of scientific knowledge.
- Increase oral health workforce capacity and flexibility
- Increase collaborations.

7. Dental practices

a. Proper referrals from medical professionals

From a common man's perspective, general health is a priority when weighed against dental health. Dental diseases are considered to be non-life threatening which leads to the concept of sheer ignorance. Increasing the number of referrals from the medical professionals through informative sessions imparted with knowledge regarding basic oral health problems can help in improving the present scenario. Anticipatory guidance can form an excellent basis for quality dental care provided to children and adolescents. The timely intervention helps in preventing the most potential dental threats during advancing years of life. Qualified paediatricians and obstetricians could also play a crucial role in encouraging the parents and expecting mothers to actively go in for regular dental consultations for their children and infants respectively by coordinating their interaction with dentists.

b. Tele dentistry

It is the practice of using video-conferencing technologies to diagnose and provide advice about treatment over a distance.⁷ Dental health professionals can make use of this valuable tool to provide health care services to rural or remote communities and other underserved patients. It could provide a new clinical dimension to the new patient-doctor relationship. Teleconsultation helps to educate

and create awareness among the general population and thereby improving their access to oral health care delivery. Dental chat rooms efficiently run by organizations and study clubs could exchange information on a variety of topics.⁸ Government should take the initiative to highlight the importance and benefits of tele-dentistry in the society by providing infrastructure and basic facility by diverting some of the responsibilities of higher institutions and centers located all around the states⁹

c. Dental aid

One of the most significant impacts of globalization over the Indian employment pattern is the entry of multinational companies which fascinates the youth. An important step towards improving access to dental care is by targeting and providing free dental aid to employees and their children so that they can further be referred to specialists. The employees could be provided with scheduled dental appointments timed at either three monthly or six monthly intervals. This could be made mandatory if the state government in conjunction works it out with the private authorities. Certain special healthcare benefits can be provided to highly efficient and competitive employees.

8. Dental professionals

Remuneration is a significant feature of human resources management, and is a crucial factor in the delivery of a good number of public health services.¹⁰ A major problem with salary-based remuneration systems in India is that there are no incentives for dentists to perform over and above the minimum that is required for them in order to keep their jobs.

A cornerstone of the theory in personnel economics is that workers respond to incentives. Specifically, it is given that paying on the basis of output will induce workers to supply more output which led us to discuss a

new model called "pay for item of service". This implies that dentists were paid a "piece-rate" for each individual treatment that carried out, with specified fees for each type of treatment.¹¹

Finally it is not what you pay, it is the way that you pay it and that's what gets the result. These can result in improving access to general population.

9. Dental health oriented schools

Schools are powerful places that help to shape the health, education and well-being of children. A significant improvement in oral hygiene of school children after imparting dental health education can be achieved effectively by training school teachers.

10. Developing social medias for oral care delivery

The use of social media for dental care include the use of electronic media for education and continuing professional development (CPD), the quality of information available to patients online, advertising on the web, and the use of social networking as a means of practice building and oral health promotion. Various social networking facilities recently evolved such as the face book, twitter, WhatsApp, Instagram etc. can be utilized for effective use in oral health care delivery.

Conclusion

India has created one of the largest health care delivery systems in the world, but people of India still suffer from a multitude of preventable and treatable general and oral health problems. In spite of opportunities that exists to integrate oral health care with general health care, weak political will, less patient awareness and economic factors restricts this noble idea. The quality of life of the population can be improved by making attempts to advance through research, education, provision of

services, and through the promotion of healthy policies.

Recommendations

We, as Public Health Dentists should seek for innovative solutions on issues affecting the dental health of our country by providing quality, comprehensive, patient-focused health care in a culturally sensitive manner while eliminating the disparities and barriers to dental health. The measures discussed above can help to design a framework for appropriate expansion and improved access to dental care services in India. It's time to redefine our profession as a unified one, through initiatives in advocacy, education, research, and the development of standards,

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REVIEW

Flexible denture resins - A new revolution in denture construction

Sheeba H. Gladstone¹, Noxy George Manjuran²

ABSTRACT

Denture bases play an important role in the success of removable prosthesis. There are a wide variety of denture resins available in the market which helps in the fabrication of denture base. Without apt knowledge it is confusing to select suitable denture base resin for specific cases. This article provides information regarding flexible denture resins and their applications.

KEY WORDS

Keywords: flexible dentures, PMMA

Introduction

Denture bases are integral part of both complete and partial dentures. In addition to its biological and biomechanical properties, denture bases play key role in the denture acceptance by the patient. They act as foundation from where denture teeth can be constructed. According to the 'Glossary of Prosthodontic terms' denture bases can be defined as the part of a denture that rests on the foundation tissues and to which teeth are attached.

History of denture base resins

Vulcanite was the first denture base material to be used.¹ It was patented by Nelson Goodyear in 1851. The vulcanite was both hard and flexible. It could be molded into required

shapes by pre-heating and special instrumentation. The stability of vulcanite was more when compared with the previously used semi-denture bases. However it had poor esthetics.

The first modified thermoplastic resin to be used was 'Fluoropolymer' in the year 1962. It also had many disadvantages like dimensional instability, distortion due to water sorption² etc. Poly (methyl methacrylate) or PMMA was used as a denture base material for the first time in the early 1930s. It became an instant success because unlike the previously used denture bases it had reasonable dimensional stability and esthetics.

Later on it was found that PMMA was prone to polymerization shrinkage. This often resulted in denture failure and post insertion adjustments.³ PMMA had yet another disadvantage of causing monomer allergy due to the presence of residual monomer to the patients^{4,5}; and both allergy and pulmonary response in lab personnel due to inhalation of monomer vapour.⁶

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The twenty first century marked the resurrection of Vulcanite as 'the new revolutionary material' in denture base construction. The old valplast (vulcanite) was reinforced with nylon, glass fibers etc. to render it strong and unbreakable. These denture base resins came to be called as flexible denture resins.

Properties required for an ideal denture base resin are as follows :-

1. High modulus of elasticity with high proportional limit
2. High fatigue strength
3. High impact strength
4. Abrasion resistance
5. Softening temperature above mouth temperature
6. Impermeability to oral fluids
7. Low specific gravity
8. Repair without any distortion
9. Ease of manipulation
10. Colour stability
11. Biocompatibility
12. Comfort
13. Conducive to routine oral home care cleaning procedures

Other than these requirements an ideal denture base should be plaque resistant and should have adequate retention and resistance to dislodging during normal masticatory function. A good denture base should cover and protect denture bearing tissues other than forming the basement for denture construction. It should provide good peripheral seal and esthetics.

Poly (methyl methacrylate) dentures vs flexible dentures

Today, after a century since its inception, PMMA still remains as the most popular form of denture base material. PMMA has many advantages like dimensional stability, wear resistance, easy manipulation and reasonable cost. These advantages often makes one overlook its disadvantages.

The recent developments in the field of 'Dental Materials' had helped in the emergence of newer and more novel forms of denture base resins. One such new denture base material is the modified flexible denture resin. Dentures made from flexible resins are dimensionally more accurate when compared to other denture base materials. This is due to the fact that flexible dentures use injection molding technique. So there would be no shortage of material especially in the posterior palatal seal area during packing of the flask. This is not possible in conventional flasking.

Flexible dentures are miles ahead in denture esthetics. They are monomer free. And they have the added advantage of being unbreakable.

PMMA resins are available as two components i.e. powder and liquid (monomer polymer) whereas flexible resins are available as a single component in cartridge form. Laboratory manipulation of flexible denture resins takes lesser time than conventional PMMA denture resins.

Though the flexible dentures have many advantages they have a few disadvantages as well. Some of them are as follows:-

1. Selection of cases

Flexible dentures cannot be incorporated in all cases. It should not be advocated in long

span partial dentures, V- shaped palates and wide arch complete dentures.

2. Mechanical properties

Studies conducted by N. Yunnus et al have proved that flexible denture base resins have low values with regard to its flexural strength and flexural modulus^{7,8,9}. Hardness of flexible denture base resins are also less when compared to PMMA.

3. Instrumentation

Expensive instruments and injection unit are necessary for the manipulation of flexible resins¹⁰.

4. Cost

More as compared with PMMA dentures.

Indications for the use of flexible denture resins

1. Full dentures where arch area is less
2. Partial dentures which does not cross midline
3. Bases
4. Reliners
5. Mouth guards in sports
6. Bruxism splints (night guards)
7. Bite splints
8. Gum veneers
9. TMJ splints
10. Obturators
11. Undercuts
12. Speech therapy appliances
13. Orthodontic retainers
14. Sleep apnea appliances

15. Patients prone to breaking dentures

16. Patients prone for monomer allergy

Comparison of different flexible denture base materials

	VALPLAST	LUCITONE FRS	THERMOFLEX
1. Primary indications ¹¹	All partials	Full dentures Night guards Immediate partials	Full dentures Night guards Immediate partials
2. Wear	Less durable	Durable	Wear resistant, durable, resilient, unbreakable
3. Ideal	Patients application	Patients allergic to metal or monomer	Patients allergic to metal or monomer
4. Features	Light weight, injection method, less water sorption	Light weight, injection method, strength, good fit	Light weight, injection method, strength, good fit
5. Benefit	Fair esthetics	Optimum esthetics	Optimum esthetics

Conclusion

There are many varieties of denture bases available in the market. A careful study should be done before selecting the material. Flexible denture resins are a boon for patients allergic to monomer and patients having deep undercuts.¹² It provides exceptionally good esthetics and superior comfort to the patients.

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REVIEW

Transposition of teeth- A review

Shaniya Sain¹, Reshmi J², Anandaraj S³, Sageena George⁴, Jyoti Sumi Issac⁵, Sheen Ann John⁶

ABSTRACT

Tooth transposition is a rare phenomenon that affects various populations. Tooth transposition is an anomaly in the position of teeth where two teeth of the same maxillary quadrant change their position in the dental arch. There are different types of transpositions, classified according to the involved teeth. The review of the etiology of tooth transposition aims at identifying the factors related to its occurrence

KEY WORDS

Keywords: Tooth Transposition, Canine, Lateral Incisor

Introduction

Tooth transposition is a rare condition and is related to the eruption disturbances of teeth and to the subsequent abnormal occlusal relationships.¹ Transposition is a peculiar type of ectopic eruption in which each ectopic tooth changes the normal order of the tooth sequence in the dental arch.² Tooth transposition is defined as an interchange in position of two adjacent permanent teeth in the same quadrant of the dental arch or eruption of a tooth in a place normally occupied by another tooth.³ Whereas impaction refers to a failure of a tooth to emerge into the dental arch, usually due to either space deficiencies or presence of an

entity blocking its path of eruption.⁴ Another term that is highly confused is transmigratio which is defined as intraosseous migration of unerupted teeth across the midline.⁵ Transposition can be considered as ectopic eruption which leads to abnormal sequence of the permanent teeth.

Classification

Transpositions are classified into two categories; they are complete and incomplete transposition. It is complete when both the crowns and roots of the teeth are involved. It is incomplete when only the crown is transposed but the root is in its normal position.³

The five types of tooth transposition observed in the upper jaw were classified by Peck and Peck according to the teeth involved:

1. Canine – First premolar (Mx.C.P1)
2. Canine – Lateral incisor (Mx.C.I2)
3. Canine to first molar position (Mx.C.M1)
4. Lateral incisor – Central incisor (Mx.I2.I1)
5. Canine to central incisor position (Mx.C.I1).²

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Elizabeth C. Weeks classified transposition into true and false.⁶ The true is again sub divided into unilateral and bilateral. In true transposition, (fig-1) the involved teeth do occupy each other's respective position. False transposition (fig-2) involves teeth that do not occupy each others normal position. For example in the case of canine and central incisor transposition, the canine has taken the position of central incisor by migrating mesially and central and lateral incisor will be in normal sequence but migrated or forced distally. Pseudo transposition is the variations of tooth sequence that mimic transposition yet technically do not fit into transpositions.^{3,7,8}

Prevalence

The prevalence of tooth transposition varies from 0.09% to 1.4%^{1, 2, 9} In Indian population the prevalence comes around 0.43%.¹⁰ The occurrence of maxillary tooth transposition was found to be higher than the mandibular. The high bone density of the mandible might be responsible for a prohibition of the phenomenon of tooth transposition, and thus the higher incidence of maxillary occurrence.¹¹ Most prevalent type of transposition is between maxillary canine and first premolar then comes the maxillary canine and lateral incisor.^{3,12}

It is remarkable that the most common type of tooth transposition in the mandible takes place between the canines and lateral incisors, where the bone is more porous than in the posterior area. In contrast, the lower density of bone in the maxilla may enhance the incidence of tooth transposition as well as the variety of types of transposition (eg, between canines and first premolars, between canines and lateral incisors, between central and lateral incisors).^{11, 13-16}

Unilateral transpositions are more common than bilateral ones with a ratio of 4:1. In unilateral cases left side has predominance. It is more often seen in females than in males.^{2,6}

Etiology

The etiology of tooth transposition is not yet clear, and the various existing theories point to etiologic factors related to the location of the transposition and to the dental elements involved. The position of the tooth crypt in the maxilla is determined by the shape of adjacent structures, particularly of the teeth located in the anterior maxilla¹⁷. Physiologic tooth migration and tooth eruption path are extremely influenced by the morphology and growth pattern of local bone tissues. The eruption path, which generally follows root orientation, can be influenced and altered by maxillary spaces, mechanical obstructions and variations in the speed of growth.¹⁷ The upper canine, in its pre-eruptive stage, occupies a relatively high position, adjacent to the apertura piriformis and above the position occupied by pre-erupted premolars. Therefore, upper canines present increased risk of ectopic eruption.¹⁸ Maxillary canine and first premolar transposition is currently considered a tooth position anomaly caused by genetic factors, and presents a multifactorial inheritance pattern.^{2,9,10,19} The developing mandibular permanent lateral incisor normally resorbs the root of the deciduous tooth during the process of eruption into the oral cavity. It is still unclear what causes a tooth to deviate from its normal path of eruption and erupt ectopically. Transposition is due to genetic control within the dental follicle,^{10,13} interchange in the position of the developing tooth buds, early loss or prolonged retention of deciduous teeth, and trauma and mechanical interference to the erupting permanent teeth,^{7,13} prolonged retention of the deciduous lateral incisor, crowding and inadequate arch length.^{20,21}

Tooth transposition has been reported to be associated with other dental anomalies such as missing teeth, small or peg-shaped maxillary lateral incisors, retained deciduous mandibular lateral incisors and canines, rotations and

malposition of adjacent teeth, and root dilacerations and impactions.¹⁵ These anomalies are observed in 36.5% of the cases of canine transposition².

The condition can be effectively managed if it is detected and diagnosed early²²

Clinical diagnosis and radiographic evaluation

As the eruption of lateral incisors occur at 6-8 years of age, early mixed dentition period is the best time for assessing the development and path of eruption of the mandibular permanent lateral incisors. Panoramic radiograph is very useful in early diagnosis of the condition. The position and path of eruption of the unerupted teeth can be monitored effectively in panoramic view.²²

Treatment protocol

If the alteration is detected early, interceptive procedures including the extraction of deciduous teeth and placement of eruption guides for the permanent teeth may be performed, preventing complete development of the anomaly.²³ Transpositions detected later must be approached as part of a comprehensive treatment plan for the entire dentition. Treatment considerations for transposed teeth include repositioning them in their normal place in the dental arch, maintaining them in their transposed position, or extracting one of the transposed teeth. In managing treatment for mandibular tooth transposition several factors should be considered such as the amount of distally displaced lateral incisor and the intrabony position of the permanent canine. Early detection of the abnormal eruption path of the lateral incisor allows for early intervention by uprighting and moving the lateral incisor to its normal place in the arch prior to the eruption of the canine into transposition with the lateral incisor. Attempts to correct tooth order may lead to gingival

recession with loss of periodontal attachment, prolonged treatment time, and root resorption. Because of bone density and limited labiolingual dimension of the alveolar process in the mandible, teeth are better kept in their transposed position in the mandibular arch. The possibility of correcting tooth order in the maxillary arch is greater. However, maintaining tooth order is recommended with maxillary first premolar/ canine complete transpositions because of tooth resemblance. Maintaining maxillary canine/lateral incisor transpositions may result in an esthetic compromise that can be improved with the recent innovative techniques in restorative dentistry.²²

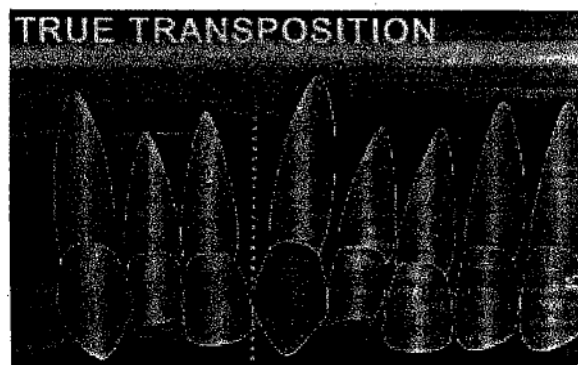


Fig-1-True transposition

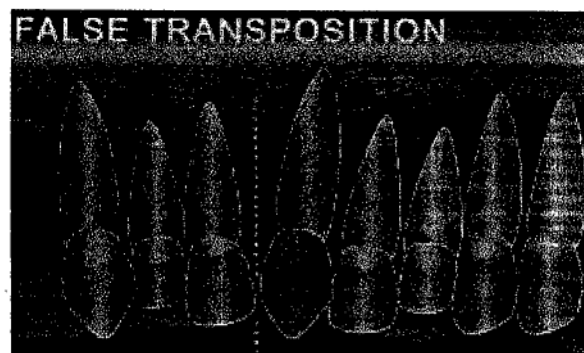


Fig-2-False transposition

Conclusion

Timely detection of a distally displaced mandibular permanent lateral incisor in the early mixed dentition, at the age of 6-8 years, and appropriate interceptive procedures may reduce the risk of tooth transposition in the mandible and avoid complex orthodontic therapy. Transpositions should be managed as part of a comprehensive treatment plan.

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ABOUT THE JOURNAL

The Trivandrum Dental Journal, the official publication of the Indian Dental Association, Trivandrum Branch, is intended to be a research periodical that aims to inform its readers of ideas, opinions, developments and key issues in dentistry-clinical, practical and scientific, stimulating interest, debate and discussion and an opportunity for life long learning, amongst dentists of all disciplines. All papers published in the TDJ are subject to rigorous peer review by our excellent review board. We have tried to design the journal in such a way that the readers can find the relevant information fast and easily.

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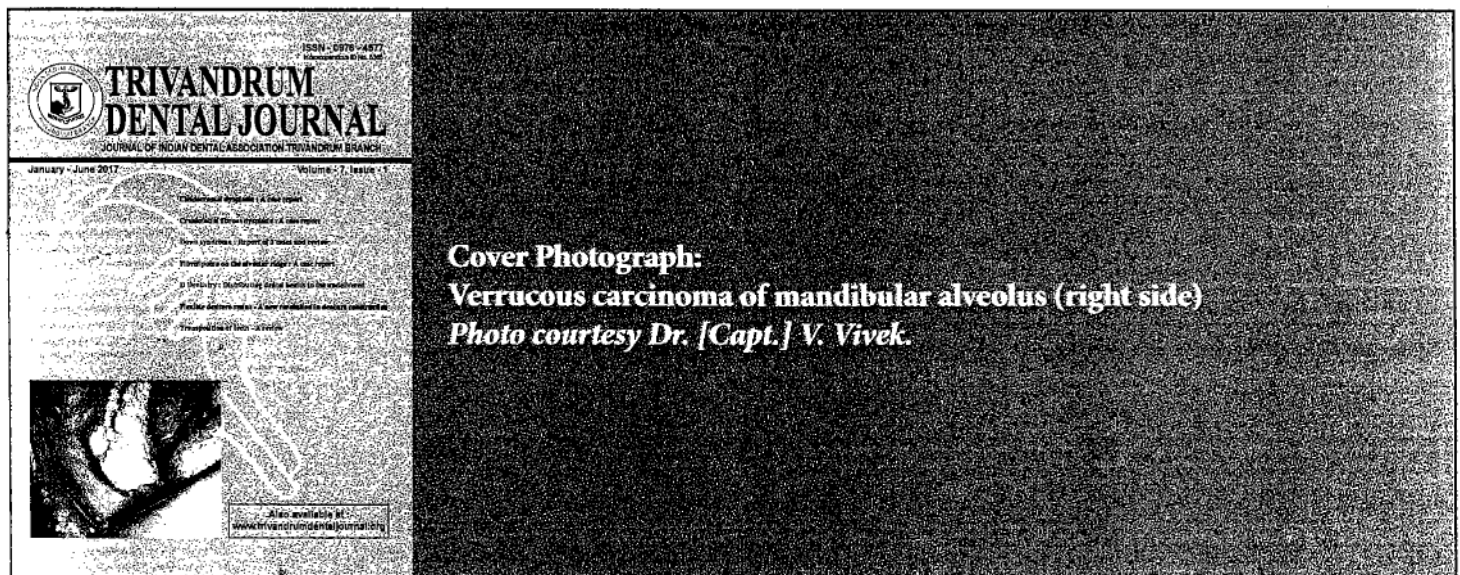
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Summaries: this section acts as a bridge between the practice and research sections, providing a summary of the research papers in this issue. Besides the abstract and 'in brief' box, in this page, we plan to include a comment on each paper by a specialist in the field, emphasizing the relevance of the paper, to ensure that the information from the research is easily available to both practitioners and researchers.

The cover page design

The shanku or the conch was considered as one of the common emblems of majority of Kerala feudal Kingdoms of the past, including Travancore. The official Kerala State emblem also symbolizes two elephants guarding the imperial conch and its imperial crest. The graphical representation of the conch ('shanku') is adapted to be the design on the cover page of the TRIVANDRUM DENTAL JOURNAL.



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