



Editorial

By definition Journalism is the production and distribution of reports on the interaction of events, facts, ideas that informs the society to at least some degree. Dentistry is a branch of Medicine that is involved in the study, diagnosis, prevention and treatment of diseases of oral cavity, most commonly dentition (teeth), oral mucosa and paraoral structures. The other terms form for study of dentistry is an ancient as the history of humanity. There are evidences dating back to 7–9 thousand years back of teeth being drilled. Remains of Harappan periods and Indus valley civilization show as such evidences. Since then mankind has evolved to present state of development, where dentistry has evolved leaps and bounds. Now is the era of research and development and where evidence based practice of dentistry is the need of hour.

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Pacific Journal of Dentistry (PJD) is an official journal of Pacific Academy of Higher Education & Research, Udaipur. Journal has been designed keeping in mind need for all the dental specialties & journal places an emphasis on publishing high quality and novel research. Any suggestions or comments regarding improvement in journal are always welcome.

Dr. Mohit Pal Singh
Editor in chief



Pacific Journal of Dentistry

(AN OFFICIAL JOURNAL OF PACIFIC ACADEMY OF HIGHER EDUCATION & RESEARCH)

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Editorials

Review articles

Original Research articles

Short Communications

Letter to editor

Clinical Case Reports

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Do not repeat in detail data or other material given in the Introduction or the Results section. In particular, contributors should avoid making statements on economic benefits and costs unless their manuscript includes economic data and analyses. Avoid claiming priority and alluding to work that has not been completed. New hypotheses may be stated if needed, however they should be clearly labelled as such. About 30 references can be included. These articles generally should not have more than eight authors.

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4. Tables should be typed on separate pages.
6. Make sure for Headings of Tables, their numbers and Captions of illustrations. Don't repeat the information in tables if it is covered in the text.
7. Photographs illustrations with high resolution and along with their captions.
8. Disclosure regarding source of funding and conflict of interest if any besides approval of the study from respective Ethics Committee/Institution Review Board.
9. Covering Letter.

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Dr. Mohit Pal Singh (Editor in Chief)
Pacific Journal of Dentistry
Pacific Dental College & Hospital
Airport Road, Debari, Udaipur-313024 (Raj.)
Email Id : jpaherpdch@gmail.com
Phone No. 9672917860



Pacific Journal of Dentistry

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Note

Previously, this Journal has been published as Journal of Pacific Academy of Higher Education & Research (JPAHER) and was publishing Articles related to Dentistry. On requesting for RNI No., the RNI allotted the title "Pacific Journal of Dentistry". So, forth the "JPAHER" would be known as "Pacific Journal of Dentistry". Therefore, we regret to our readers for their inconvenience.

-Editor

Original Research

Efficacy of bioresorbable copolymer osteosynthesis system in Rigid internal fixation of zygomatic complex fractures in 84 patients: A descriptive study with review of literature

Chandrashekhar Chattopadhyay,

Assistant Professor,
Department of General Dentistry,
SN Medical college, Shastri Nagar,
Jodhpur

P Suresh Menon,

Professor & Head,
Department of Oral & Maxillofacial surgery,
Vydehi Institute of medical sciences
& research centre,
Bengaluru

Address for Correspondence:

Chandrashekhar Chattopadhyay,

Assistant Professor,
Department of General Dentistry,
SN Medical College,
Shastri Nagar, Jodhpur

Abstract

Background: The zygomatic bone unites various structures of the facial skeleton. It gives prominence to the face and protects the globe of the eye. Rigid internal fixation (RIF) is the most reliable & effective method to achieve osteosynthesis.

Aim & Objectives: To evaluate the effectiveness of Biodegradable osteosynthesis system (Copolymer of Poly-L-Lactic Acid, Poly-D-Lactic Acid and Polyglycolic Acid) in rigid internal fixation of zygomatic complex fractures, and evaluate the stability provided during fracture healing, efficacy of manipulation & adaptability of biodegradable panels and any complication.

Material and Methods: Adult patients with fracture of zygomatic complex were included. Biodegradable osteosynthesis system (Delta System) was used in the study. All cases were managed with two point fixation. All the patients were assessed for minimum 01 year.

Results: In 84 patients (80 males & 4 females), (the age range 20 to 56 years), Road traffic accidents (78 cases) were the most common cause followed by assault (06 cases). There was screw breakage in 12 cases intraoperatively. The average operative time taken was 1.3 hours due to the need for the use of a tap for screw. The adaptability of the panels was good. Bone healing was satisfactory. No complications were seen post surgically over duration of 2 years follow up.

Conclusion: These devices are suitable for rigid internal fixation. Limitation in management with these devices was the cost factor.

Keywords: Zygomatic Complex fractures; Bioresorbable copolymer osteosynthesis system, trauma

Introduction

The zygomatic bone unites various structures of the facial skeleton. It gives prominence to the face and protects the globe of the eye. Banks (1981) coined the term 'Zygomatic Complex' fractures for the injuries related to zygomatic bone & surrounding structures. Undisplaced fractures can be managed without active surgical treatment. However, in high velocity injuries causing displacement, exposure of bone at one or more sites is mandatory to stabilize and provide fixation to facial skeleton.²

Rigid internal fixation (RIF) is the most reliable & effective method to achieve osteosynthesis. The surgery to remove the metallic implant is

often required after the healing process. A second operation may have significant impact on patients' health & morbidity. Some patients often experience temperature sensitivity with metal implants and may become uncomfortable due to visibility & palpability below mucosa & skin. The disadvantages & complications associated with metallic fixation devices used in maxillofacial region and the need of subsequent removal surgery due to various post-surgical complications, has given a step ahead for development of biodegradable mini-osteosynthesis devices.^{2,3}

Bioresorbable synthetic polymers have been used for biomedical applications for a long time. Polylactic acid (PLA) and Polyglycolic acid (PGA) as well as their copolymers have been used extensively for manufacturing fixation devices in orthopaedic surgery since 1980.³ Cutright et al. (1971)⁴ pioneered the use of bioresorbable implants & devices for fracture fixation in the field of maxillofacial surgery followed by various experiments performed successfully by Suuronen R⁵ in the maxillofacial region. The advantageous property of biodegradable implants is the fact that once fixed in bone, they degrade slowly thus maintaining sufficient stabilization of the fixed bone till bony union has accomplished. Since their modulus of elasticity simulates bone, stress shielding effect is not a feature. Another advantage is that the breakdown products after degradation of these polymers by hydrolysis end up in by products that are naturally occurring products of metabolic activity of the body.⁶

Aim & Objectives

To evaluate the effectiveness of Biodegradable osteosynthesis system (Copolymer of Poly-L-Lactic Acid, Poly-D-Lactic Acid and Polyglycolic Acid) in rigid internal fixation of zygomatic complex fractures, and evaluate the stability provided during fracture healing, efficacy of manipulation & adaptability of biodegradable panels and any complication.

Material and methods

This study was carried out at the department of Dental Surgery of a tertiary care center in Western Rajasthan India between May 2013 to April 2017. These patients were either referred from various affiliated, peripheral or private hospitals or those who reported directly to OPD of Dental Surgery. The study population was included following strict inclusion and exclusion criteria. Similar clinical, radiological evaluation procedure and surgical procedures were adopted and surgery was performed by the same surgeon.

Inclusion Criteria

1. Clinical and radiological evidence of Zygomatic complex fractures (ZMC).
2. Grossly displaced & depressed ZMC fractures.

3. Patients having only isolated ZMC fractures.
4. Willing to participate in routine recall and undergo radiological evaluation during follow up.
5. Patients of any age group

Exclusion Criteria

1. Medically compromised patients.
2. Any case that had loss of overlying soft tissue envelope or infection in the region.
3. Patients with polytrauma or panfacial fracture
4. Compound comminuted fracture of zygoma
5. Severely displaced fractures of other associated bones.
6. Patient's not willing to participate in study.

A total of 84 patients (80 Males & 4 Females) with zygomatic complex fractures (Figure 1a) were selected for rigid internal fixation using Bioresorbable copolymer osteosynthesis system. The age of the patients was ranging from 20 to 56 years. 78 patients had sustained fracture due to motor vehicular accident / road traffic accidents. 06 patients had trauma due to physical assault. 76 patients had fracture of right zygomatic complex and 08 patients had fracture of left zygomatic complex. 08 patients reported within 3 days of trauma and remaining patients reported with delay ranging from 3 to 7 days. A clinical evaluation was done to note the status of soft tissue injuries, ophthalmologic deficit, functional problems, neurological deficit, oral hygiene status and presence of any associated hard or soft tissue pathology.

Radiographic evaluation (Figure 1b)

Occipitomental (waters projection) and submentovertex view of skull were taken for all patients.

Materials

The Bioresorbable copolymer osteosynthesis system used for fixation and immobilization of fracture fragments in this study are manufactured by Stryker Leibinger Corp, Freidburg, Germany. The biomaterials used for the Bioresorbable copolymer osteosynthesis system was poly α -Hydroxyl acid. It is a copolymer of poly-L-Lactic Acid (PLLA), poly-D-Lactic Acid (PDLA) and polyglycolic Acid (PGA) in the ratio of 85/5/10%.

Delta system devices (Bioresorbable copolymer osteosynthesis system) (Figure 2a, 2b, 2c)

1. 2.2 mm resorbable 4 hole & 6 hole straight panels with a thickness of 1.4 mm X 6.00mm width
2. 2.2 mm resorbable screws with 4-6 mm length – non self tapping
3. Drill bit made of titanium - 1.8 mm diameter.

4. 2.2 mm bone tap
5. A contouring Pen
6. 2.2 mm Screw driver blade with handle.
7. Water bath for heating panels.

Method

Preanaesthetic evaluation was carried out by the anaesthesiologist and patients were graded as per ASA grades. Informed written consent for surgery under general anaesthesia was obtained.

Surgical technique

The operative site was prepared under strict aseptic measures. Minimum of 2 point fixation of ZMC was followed. In our study, the fixation was carried out at the zygomatic buttress region & fronto-zygomatic suture. Lateral brow incision was used to expose fracture at fronto-zygomatic suture region & fracture was reduced (Figure 3a). Fractured arch was also reduced using a Howarth's/periosteal elevator. Audible click (pop) was heard on correct reduction which was later confirmed by palpation of any residual step over the arch or infraorbital rim. Transoral buccal vestibular incision was used to expose the zygomatico-maxillary buttress region (Figure 3a). Incision extended from first molar region to canine region. After subperiosteal dissection, fracture was exposed & reduced. Fixation of these fractures was performed using the Delta System 4-hole resorbable plates (Figure 3b). Using micromotor and titanium drill bit (1.8mm) a screw hole was made. After drilling, bone tap was used to make screw insertion easier. The plate was held in water bath maintained above the glass transition temperature (T_g) 70° Celsius for molding and adaptation. Contouring pen was then used in situ for contouring the plates. Using the screw driver, screw was carried to the hole and gently tightened. Alignments of fracture fragments were physically verified. Watertight closure of surgical wound was done in layers using interrupted sutures. Post-operative antibiotics and analgesics were prescribed for five days. Patients were discharged on 7th post-operative day after suture removal (Figure 4).

Post-op evaluation parameters were

1. Stability of fracture fragments
2. Wound healing
3. Recovery from sensory deficit
4. Palpability of implants
5. Mouth opening
6. Restoration of anatomic contour of face

Post-operative radiographs were taken after 7 days, 3

months, 6 months and 12 months. Radiographs were used to assess the reduction & alignment of fracture fragments, bony union and to check for any evidence of osteolytic activity (Figure 5).

Results

84 patients having ZMC fractures were managed by ORIF using Delta System. Out of the patients selected, 80 were males and 4 were females. The age of these patients was varying from 20 years to 56 years with peak incidence in the age group of 20-30 years. 78 (92.85%) patients sustained trauma due to Road Traffic Accidents (RTA) and 6 (7.14%) due to physical assault. 90.47% (76) fractures occurred on right side of face and 9.52% (8) occurred on left side of face. (Graph 1)

The main clinical signs/symptoms were (Graph 2)

- (i) Restricted mouth opening – 82
- (ii) Paraesthesia/ anaesthesia of infraorbital nerve – 84
- (iii) Flattening of cheek prominence - 80
- (iv) Diplopia - 3

Average time delay from the occurrence of injury to surgical intervention was around 10 days. All cases were managed with two point fixation of ZMC at zygomatico-maxillary buttress region and fronto-zygomatic suture. Intraoperatively, there were incidences of screw breakage in 12 cases while tightening screw. To manage this complication, a new hole was drilled through the remnant of the broken screw in the hole and a new screw was fixed. All cases of screw breakage occurred in fronto-zygomatic region. The average operative time taken was approx. 1.3 hours with the Bioresorbable copolymer osteosynthesis system. Post-operatively the cases were clinically and radiologically examined. Patients were reviewed initially within first 24 hours after the surgical procedure and thereafter once within every 24 hours for next seven days. All patients were discharged after seventh postoperative day following suture removal.

Patients were recalled after 1, 3, 6 and 12 months for periodic checkup clinically as well as radiographically. Clinically, healing status, stability of malar prominence, infection or wound dehiscence, foreign body reaction, neurological deficit, ocular disturbance and palpability of implant along with rejection of implants, if any, were considered. There were no complications in any of the 84 cases treated by resorbable system. In all 84 cases of zygomatic complex fractures, the signs and symptoms except infra orbital paraesthesia/anaesthesia disappeared immediately post op (within 7 Postop days) after surgery, however infra orbital paraesthesia/anaesthesia persisted for six months in 72 patients and for 1 year in 12 patients. The most important finding in the post-operative follow up was

the palpability of the plates in the fronto-zygomatic region in 52 patients at the end of 6 months and none were palpable at the end of 1 year.

During radiographic evaluation, in the immediate postoperative phase, alignment and approximation of fractured fragments were observed. In all cases, adequate reduction of fracture segments and good healing was achieved. There was no mobility of the segments in any of the cases. Post-op radiographs revealed screw holes that disappeared on radiographic evaluation at the end of 6 months. In the post-operative phase, during 4 to 12 week, a decrease in radiolucency was observed in the fracture lines indicating the substantial progress of healing of bone and laying down osteoid matrix. Between 12 to 24 weeks there was no evidence of any osteolytic reaction.

Discussion

The zygomatic bone is a complex three dimensional structure. This bone also provides width and projection to the face in the horizontal plane and is directly involved with the outer and inner facial frame.⁷⁻⁹ The infraorbital nerve travels in the infraorbital groove in close proximity to zygomatic complex, thus any injury to this bone may result in ocular disturbances, neurological disturbances like paraesthesia/anaesthesia along the distribution of infraorbital nerve.¹⁰⁻¹²

In this study, 84 patients of zygomatic complex fractures presented with following clinical features that made surgical intervention mandatory - Restricted mouth opening, Paraesthesia/ anaesthesia of infraorbital nerve, Flattening of cheek prominence, Diplopia, etc. Due to the prominence provided by this bone, it is frequently involved in road traffic accidents, violence and contact sports and the fractures of zygomatic complex are the commonest facial fractures after nasal fractures.¹³⁻¹⁶ Peak incidence of zygomatic complex fractures occurs around the 2nd & 3rd decades in males and around the 3rd & 4th decades of life in females.¹⁷ These fractures are more common in males with a ratio of approximately 4: 1 over females.⁷ In our study, the age of the patients ranged from 20 to 56 years with peak incidence in the age group of 20 to 30 years.

The search for a rigid means of fixation that would at the same time allow the patient passive or even functional loading of the fractured bones culminated in RIF devices like plates and screws being developed. This consisted of plates that are malleable and miniaturised for maxillofacial reconstruction. In the midface, Solid compact bone is located at the frontozygomatic suture, infraorbital margin and zygomatic buttress.¹⁸⁻²⁰ Open reduction and RIF in at least 2 fracture sites has been the cornerstone of zygomatic complex fracture management. The frontozygomatic suture and zygomatic buttress have been the most favoured sites of

RIF in terms of stability, aesthetics and prevention of rotation in either vertical or horizontal axis of the fracture segments.²¹⁻²⁴ The zygomatic complex fractures in our study were managed using the standard protocol of a minimum of 2 point fixation at the frontozygomatic and zygomatic buttress region as recommended by various authors.^{25,26}

Currently available bone plates and screws are manufactured from Stainless steel, Vitallium and Titanium.²⁷ The excellent properties of corrosion resistance, biocompatibility and osseointegration have led to the acceptance of titanium as the metal of choice in all internal devices in contemporary maxillofacial surgery.²⁸⁻³⁰

The resorbable system used in the study was the Delta System manufactured by Stryker Leibinger of Germany. This system is a composition of Poly L Lactide / D Lactide / Glycolide with a molecular ratio of 85 / 5 / 10. This tripolymer is a combination deriving the desirable properties of strength from Poly L lactide, contourability from Poly D Lactide and absorption characteristics from Glycolide. The bulk and diameter of the currently available biodegradable material are the main factor hindering their use for the fixation of small bone fragments.³¹⁻³⁴

The dimension of plates and screws used in this study were Plate -Thickness: 1.4 mm Length: 4-6 mm Width: 6.00mm & Screw -Diameter: 2.2 mm which are not very bulky but have adequate strength. Intraoperative handling of bioresorbable material is subject of learning curve. In the bioresorbable system, the additional step in the procedure was the use of a tap prior to screw fixation as these screws are not self tapping unlike the titanium screws. After the initial learning curve (3.2Hrs) the average surgical time was 1.3 Hrs.^{35,36} The surgical protocol and post surgical management was similar to metallic fixation. The biggest advantage with the resorbable system was the ability to soften the plate and adapt it to the bony contours perfectly. There was screw breakage in two cases during the screw tightening procedure. All these were seen in the thick frontozygomatic region due to use of excess force. But the greatest advantage was that there was no necessity to retrieve the broken screws as a new hole could be drilled through the broken screw.^{37,38}

Any implanted device stimulates foreign-body tissue changes. After implantation of a polymeric device, the normal initial inflammatory response leads to granulation tissue enveloping the implant within one to three weeks. In early stages, polymorphonuclear leucocytes and later, macrophages, giant cells and large mononuclear cells are seen around the implant.³⁹⁻⁴¹ A latent period commences and continues until the degradation and bioabsorption by macrophages and giant cells begin. The faster the degradation process, the stronger the tissue response.⁴² During the most intense stage of biodegradation, some

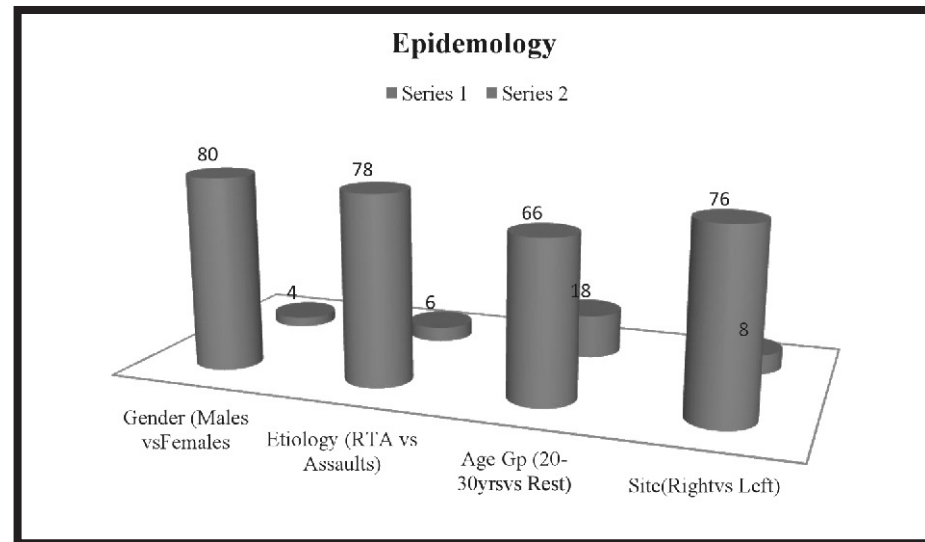
patients may show clinically local fluid accumulation,⁴³ In our study, no immediate or delayed post op complications like swelling, sinus formation were observed but as the sample size is small but this correlates well with literature.^{44,47}

Although bio absorbable materials deform earlier and resist permanent deformation less than their metallic counterparts, authors report bioabsorbables possess adequate load capacity for clinical conditions.^{48,49} Most impressive is the property of natural degradation that does not impede normal growth.^{33,34} The resorption characteristics of bioabsorbable fixation systems appear to be slow enough to offer adequate stabilization while not overwhelming the local ability to clear degradation products.^{38,50} In our study, plates were palpable for six month but disappeared completely after 12 months. 6 months period is adequate for fracture healing.

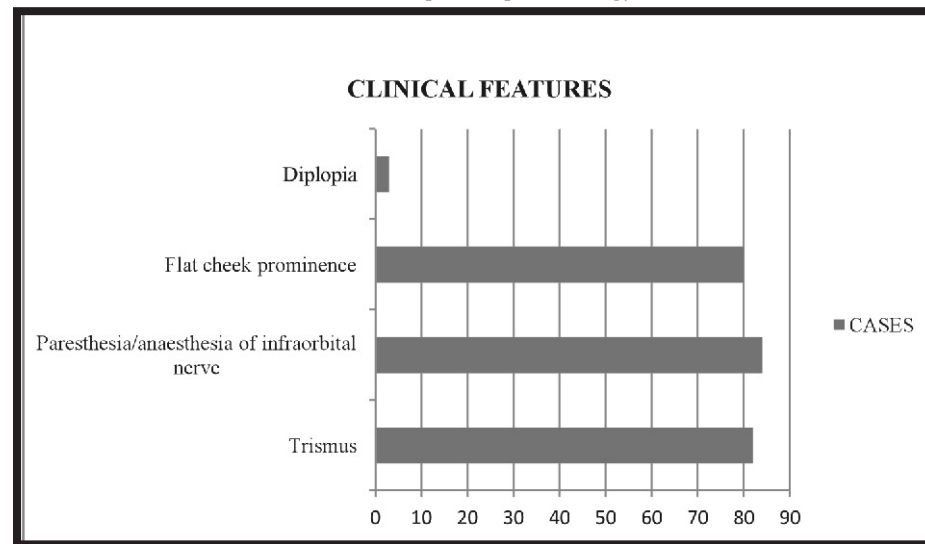
At the end of 1 year, fracture healing was satisfactory in all the cases. As the poly L/DL lactide copolymer is radiolucent, tracking degradation with radiographs is difficult. In our study, serial radiographs showed screw holes in the resorbable system that also disappeared after 6-10 months. On the basis of careful and detailed preoperative, postoperative and periodic observations and analyses, the results achieved were satisfactory in all patients. The biggest drawbacks of the resorbable system include cost and armamentarium.

Conclusion

Biodegradable fixation devices are suitable for rigid internal fixation. The major limitation in management with these devices was the prohibitive cost.



Graph 1: Epidemiology



Graph 2: Clinical Features

Figures

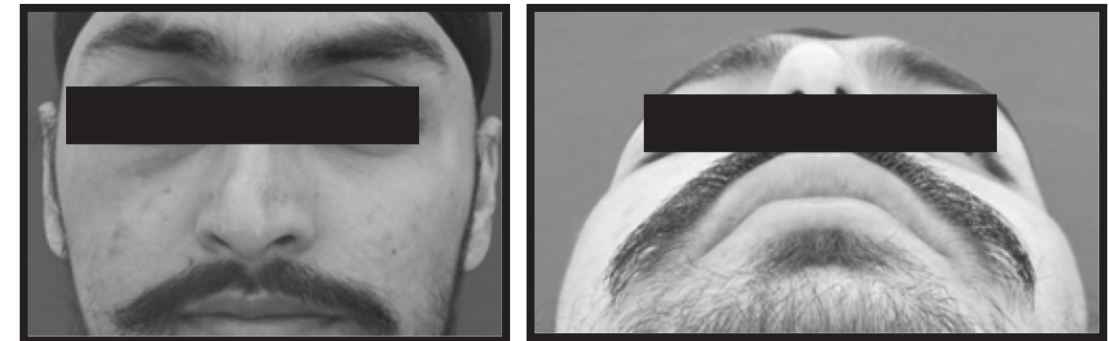


Figure 1a: Subconjunctival heamorrhage circumorbital ecchymosis & flattened malar prominence (representative case) Fig. 1: Intraoral view of maxillary & mandibular arch

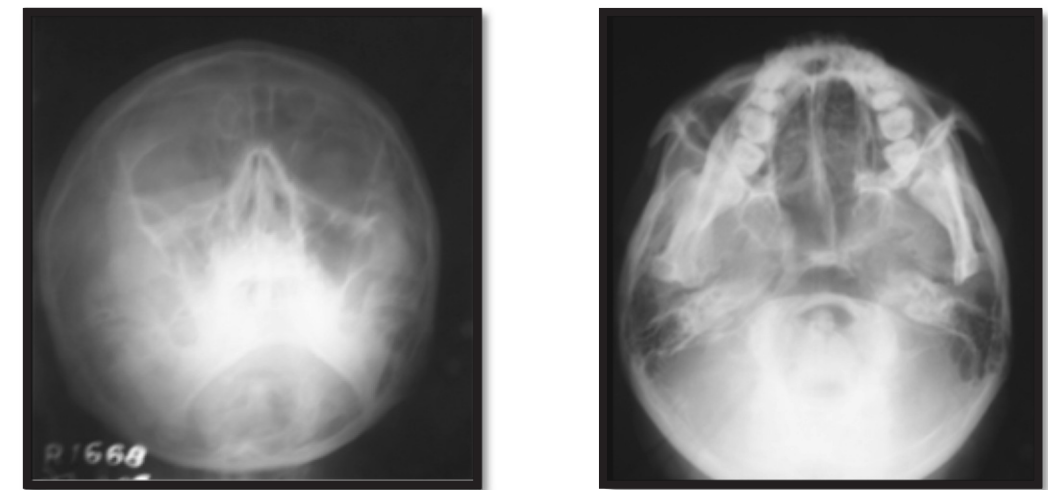


Figure 1b: Radiological evaluation - PNS view skull & SMV view skull revealing right ZMC #.

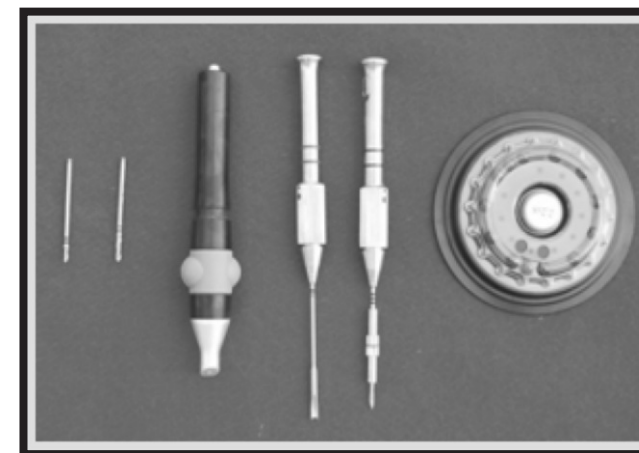


Figure 2a: Delta system — Drill bits, Plate adapter, Tap, Screw driver & screw holding cassette

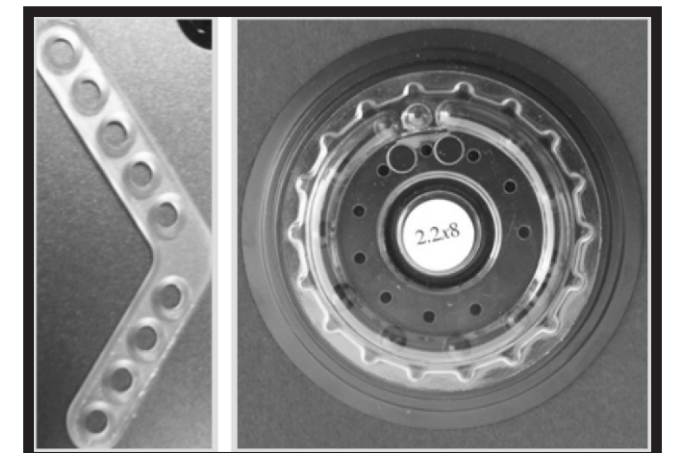


Figure 2b: Delta System — Plate (panel) and Screw in Cassette

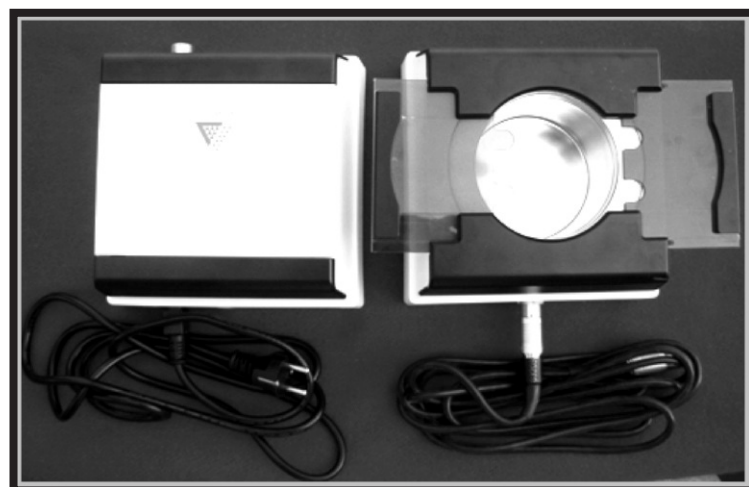


Figure 2c: Delta System —Hot water bath

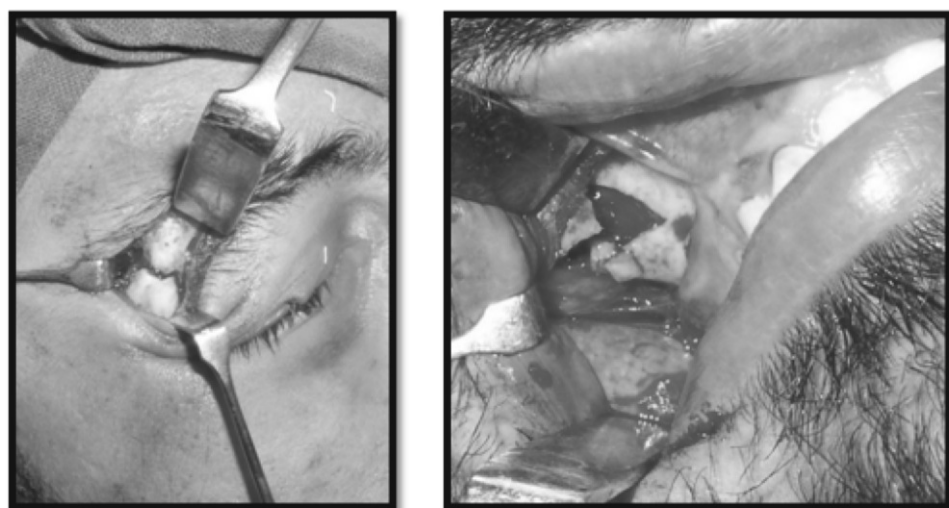


Figure 3a: Exposure of fracture at fronto-zygomatic region using lateral brow approach & fracture at zygomaticomaxillary buttress exposed using transoral approach

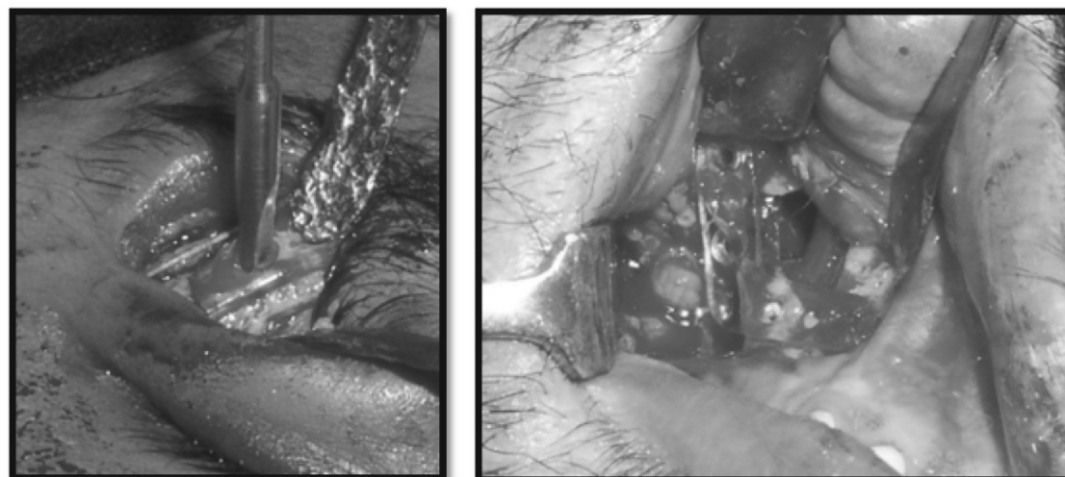


Figure 3b: Reduction & fixation at frontozygomatic suture and zygomatic buttress using delta system.

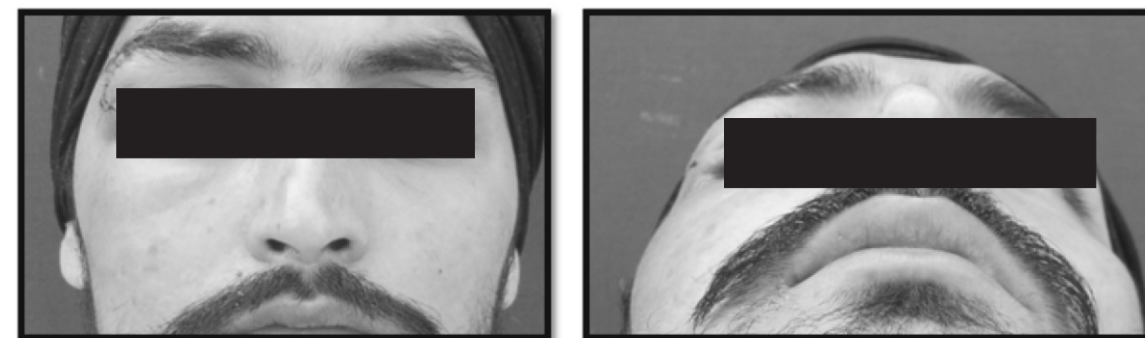


Figure 4: One week post-op photographs

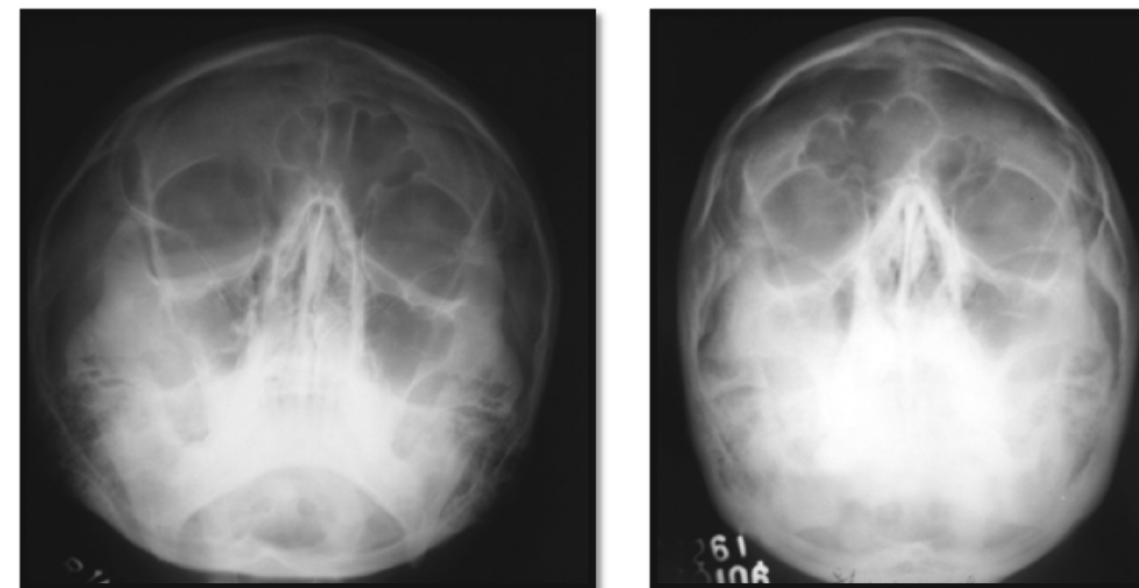


Figure 5: Postoperative radiograph after 6 months

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Original Research

Prevalence of ankyloglossia and its types in Indian school children of Udaipur city

Jagrati Singh

Postgraduate student
Department of Paediatric Dentistry
Pacific Dental College & Hospital
Udaipur, Rajasthan, India

Dinesh Rao B

Professor and Head
Department of Paediatric Dentistry
Pacific Dental College & Hospital
Udaipur, Rajasthan, India

Shubha AB

Professor
Department of Paediatric Dentistry
Pacific Dental College & Hospital
Udaipur, Rajasthan, India

Sunil Panwar

Reader
Department of Paediatric Dentistry
Pacific Dental College & Hospital
Udaipur, Rajasthan, India

Sachin Franklin

Senior lecturer
Department of Paediatric Dentistry
Pacific Dental College & Hospital
Udaipur, Rajasthan, India

Address for Correspondence:

Jagrati Singh

Postgraduate student
Department of Paediatric Dentistry
Pacific Dental College & Hospital
Udaipur

Abstract

Background: In the act of feeding, speech and suction, an anatomical structure known as lingual frenum or tongue's frenum plays a key role. Tongue-tie is an in-born oral anomaly distinguished by the presence of atypical small lingual frenulum which hampers tongue tip mobility. It causes difficulty in speech due to limitation in tongue movement. The possible sequelae of ankyloglossia are lower incisor deformity, gingival recession and malocclusion. While the prevalence of ankyloglossia is reported to range from 0.2-10.7% worldwide, not much information is available regarding its occurrence in Indian population.

Aim and objectives: To assess the prevalence of ankyloglossia and its types in Indian schoolchildren of Udaipur city.

Materials and Methods: The study was conducted on a sample of 1500 school going children of Udaipur city. Clinical and phonetic examinations were carried out to assess the lingual frenal attachment. Ankyloglossia, if diagnosed was then graded according to classification proposed by Kotlow.

Results: The overall prevalence of ankyloglossia in a sample of 1500 school children is 3.73%. Mild ankyloglossia is most common type followed by moderate and severe type, only 1 case (1.79%) had complete ankyloglossia. Males (6.32 %) had predominance over the females (1.76%) and the difference between the males and females was found to be statistically significant.

Conclusion: Mild form of ankyloglossia is most common and significant male predilection can be seen.

Keywords: Ankyloglossia, Indian schoolchildren, Prevalence, Tongue-tie.

Introduction

The soft-tissue position and its role associated with malocclusion had been discussed in literature. Lingual frenulum is a soft tissue which is often neglected or skips during routine examination.¹ Frenulum is a small muscle covering the mucous membrane,² and its main function is to maintain coordination between the lips and tongue with the developing bones of the jaw especially during the period of fetal development.³ The lingual frenum is a structure that attaches the tongue with floor of mouth permitting free movement of tongue within

oral cavity. It is an anatomical structure which plays a key role in the act of feeding, speech and suction. Any abnormality associated with frenulum attachment alters the function associated with deglutition, speech, word's articulation and tongue's movements.⁴ Tongue's frenulum drifts towards a median point to hold its final place during the eruption of tooth and with growth and development of bones.⁵ Tongue's frenulum is a structure which is composed of connective tissues rich in elastic and collagen fibers, muscular fibers, fat cells and blood vessels, and is usually covered by stratified squamous epithelium.⁶ At the time of birth, tongue is generally small with the frenum reaching to the tip of tongue and sometimes a bifid-like tip of tongue may also be seen.³ During normal course, the lingual frenum often recedes within first six months to six years. Tongue-tie appears when the lingual frenum stays as an anatomic aberration even after six years of life.⁷ The severity of ankyloglossia ranges from no clinical significance to entirely fixed tongue with the floor of mouth.

Ankyloglossia is originally obtained from a Greek words kolios (curved) and glossa (tongue). Ankyloglossia or tongue-tie is an in-born developmental oral anomaly and it is characterized by the presence of small, thick lingual frenum attaching abnormally with the tongue and to the floor of mouth.⁴ History of tongue-tie was found to be controversial as there was no agreement among professionals on the diagnosis and treatment of this congenital condition. Ankyloglossia is a condition which can be observed in neonates, children, or even adults. Tongue-tie is typically an isolated deviation or anomaly, but can be inter-connected with other craniofacial abnormalities like Opitz Syndrome, Orofacial Digital Syndrome, Simpson-Golabi-Behmel Syndrome, Ehlers-danlos Syndrome, X-linked Cleft Palate Syndrome, Kindler Syndrome, Beckwith Weidman Syndrome, Van der Woude Syndrome and others.⁸ The clinical significance of tongue-tie is varied as few authors believe it is rarely symptomatic condition⁹ while others^{10,11} feel it may create a variety of problems including speech disorders, infant feeding difficulties, lower incisor deformity, malocclusion and numerous other social and mechanical issues.

While the prevalence of ankyloglossia is reported to range from 0.2-10.7% worldwide,¹² not much information is available regarding its occurrence in the Indian population. The prevalence is more common in neonates and it is often seen that milder forms of tongue-tie may rectify with growth.¹³ Tongue-tie is seen more in males,¹⁴ with male to female ratio found to be 3:1, however, it exhibits no racial inclination.⁸ Ankyloglossia may be marked by a thick mucous membrane band at frenum attachment that can be classified as mild, moderate, severe and complete ankyloglossia.⁴

So, the current study aims to assess the prevalence, types and gender predilection of ankyloglossia in Indian schoolchildren.

Materials and Methods

The sample size consists of 1500 schoolchildren who were inspected for the existence of ankyloglossia. The age group selected was 6 to 14 years. Children suffering from any disabilities or systemic diseases were excluded from the study. Oral examination was done by a single examiner with the help of mouth mirror and periodontal probe under natural light. The criterion which was used to grade the patients as having marked tongue-tie contains the following:¹⁵

1. The tip of the tongue could not be protruded outside the mouth without clefting.
2. The tip of the tongue could not sweep the upper and lower lips easily, without straining.
3. A diastema was seen between the mandibular central incisors which were created by the lingual frenulum.
4. When the tongue was retracted, it blanched the tissue lingual to the anterior teeth.
5. The lingual frenulum did not allow a normal swallowing pattern.

Ankyloglossia, if seen was then assessed according to the classification given by Kotlow.¹⁵ The anatomical calculations were used to categorize the ankyloglossia and were recorded at the extreme opening of the mouth with the tip of the tongue touching the palatal papilla. The word "free-tongue" according to Kotlow, is defined as length of tongue from the insertion of lingual frenulum into the base of tongue to the tip of the tongue. Free tongue length was measured with the use of divider and scale and then graded according to Kotlow's classification:¹⁵

1. Clinically acceptable, normal range of free tongue: greater than 16 mm
2. Class I: Mild ankyloglossia: 12 to 16 mm
3. Class II: Moderate ankyloglossia: 8 to 11 mm
4. Class III: Severe ankyloglossia: 3 to 7 mm
5. Class IV: Complete ankyloglossia: less than 3 mm

Statistical analysis was carried out using Social Sciences software version 22 for Windows (SPSS Inc., Chicago, IL, USA) and data was analyzed. Chi-square test was used in the current study to compare the prevalence of ankyloglossia and its types on the basis of gender. Significance for the study was considered at the $p < 0.05$ level.

Results

A total of 1500 schoolchildren were inspected for the presence of ankyloglossia, amongst which 56 (3.73%) were identified with positive finding (Figure 1). On comparing males and females, it was observed that the males (73.21 %) had majority over females (26.79 %) and the difference between the genders was statistically significant (p <0.0001) (Figure 2) (Table 1). When different grades of ankyloglossia were assessed among the population, it was found that grade I mild (64.29%) was predominantly seen followed by grade II moderate and grade III severe cases. Grade IV complete, most severe form of ankyloglossia was found in only 1 case (Figure 3), though, the difference between the different types of tongue-tie were not statistically significant (Table 1).

Discussion

Ankyloglossia remains a controversial subject with wide and different views regarding its clinical significance worldwide. In children, ankyloglossia is asymptomatic in many cases. As growth occurs condition resolves spontaneously, or in some mild cases children may learn compensatory mechanisms to counteract decreased lingual mobility.^{16,17} With low prevalence rate worldwide, not much information is available regarding its occurrence in the Indian population. Due to shortfall of research in Indian children, it seems to be imperative to estimate the occurrence of tongue-tie.

Sample size for the present study belonged to 6 to 14 years of age group, age at which tongue development was completed long back. Very few studies outline the prevalence of ankyloglossia amongst the present age group. Out of 1500 children examined for tongue-tie, 56 (3.73%) were recognized as having remarkable tongue-tie. The results of

the study were in accordance with the other studies done by Hogan et al.,¹² who reported 10.7%, Messner et al.,¹⁴ observed the prevalence of 4.8%, , Ricke et al.,¹⁸ demonstrated 4.24% and Ballard et al.,¹⁹ showed 3.2%. Another study conducted by Bai et al.,² compared tongue-tie in general and special school children showed a higher incidence of 16.4%.

Difference was seen between the genders with males showing greater predilection than their counterparts and statistically significant results were obtained. These observation seems to equate with the outcome of Bai et al.,² Messner et al.,¹⁴ Ballard et al.,¹⁹ although vary from the results of Ruffoli et al.,⁷ In present study, grade I that is mild ankyloglossia is the most common type followed by grade II and grade III type of ankyloglossia but the difference was not statistically significant, a finding similar to the study done by Bai et al.,²

Conclusion

In the present sample size of 6 to 14 years, age at which the development of tongue was completed long back, this study was conducted to further explore the development of lingual frenum and the problems associated with it. Prevalence of ankyloglossia in the present study was 3.73% with significant male predilection. Among which mild form of ankyloglossia is most common. Since the prevalence of ankyloglossia is relatively common, it is important that paediatric dentists should be well trained and efficient of diagnosing and treating younger children so as to prevent the possible sequelae in future. Parents should be informed about the possible sequelae and problems related with ankyloglossia. Timely diagnosis aids in achieving remedial measures with the incomparable possible result.

Table 1: Incidence of ankyloglossia according to gender and its grades

Gender	Positive cases	Ankyloglossia			
		Mild	Moderate	Severe	Complete
Male (n=648)	41	25	11	4	1
Female (n=852)	15	11	2	2	0
p- value	<.001	0.58	0.48	0.70	0.54
Total	56	36	13	6	1

Figures

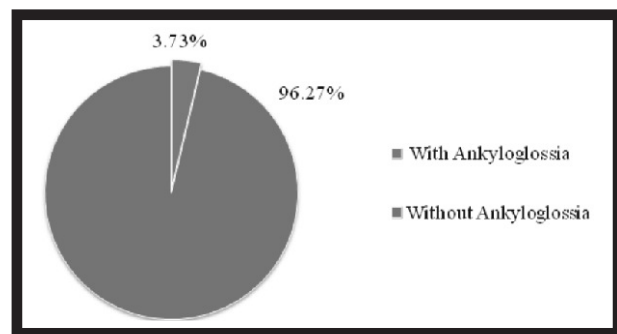


Figure 1: Overall prevalence of ankyloglossia

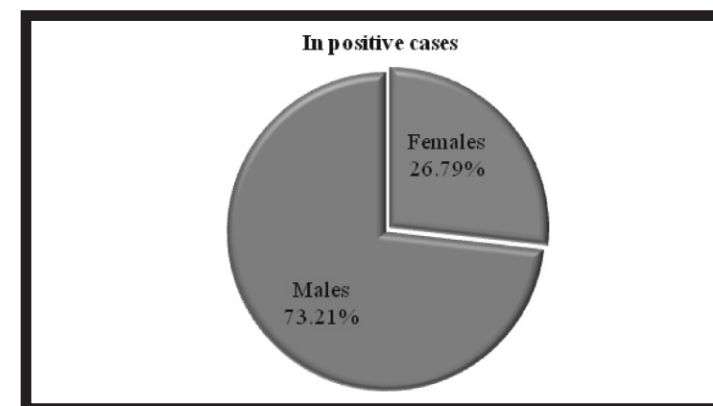


Figure 2: Prevalence of tongue-tie according to gender

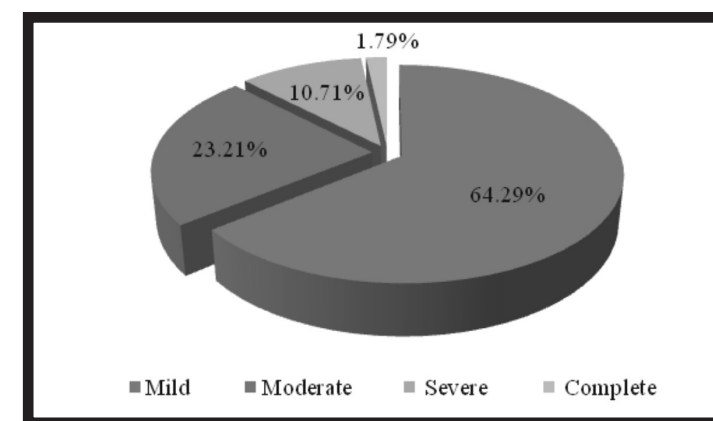


Figure 3: Grades of tongue-tie in entire population

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Original Research

Prevalence of Supernumerary Teeth in Indian Children Of Udaipur City

Shivani Modi

Postgraduate student
Department of Paediatric Dentistry
Pacific Dental College and Hospital

Dinesh Rao B

Professor and Head
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Sunil Panwar

Reader
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Sachin Franklin

Senior lecturer
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Mitul Joshi

Postgraduate student
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Address for Correspondence:

Shivani Modi

Postgraduate student
Department of Paediatric Dentistry
Pacific Dental College & Hospital
Udaipur

Abstract

Aims and objectives: The aim of the current study is to examine the prevalence, characteristics and gender distribution of supernumerary teeth among children aged 6 to 14 years residing in Udaipur city.

Methodology: A retrospective study was conducted using intraoral periapical radiographs and orthopantomogram radiographs, and study models of pediatric patients attending paediatric setup for a period of one year (August 2015 to July 2016). Study model and radiographic examinations were retrieved to explore the incidence of supernumerary teeth.

Results: The study revealed that overall prevalence of supernumerary teeth was 7% of which 69.65% were males and 39.35% females. Supernumerary teeth were commonly seen in maxilla when compared to mandible. Mesiodens was the commonest supernumerary tooth followed by paramolar, distomolar, and supplementary lateral incisors.

Conclusion: The prevalence of supernumerary teeth was established to be 2.1%, predominantly mesiodens were the supremely observed supernumerary teeth in present study.

Keywords: supernumerary teeth, mesiodense, paramolar, distomolar, primary teeth, permanent teeth

Introduction

Supernumerary teeth defined as teeth present in excess of the number found in the normal dental formula,¹ and the result of a sporadic alteration in odontogenesis. Supernumerary teeth have been reported to arise in both primary and permanent dentition; singly, multiply, unilaterally, or bilaterally; and in one or both jaws. They are most frequently found in the premaxilla, but may occur all over in the dental arch.^{2,3} Around 80% of all supernumerary teeth are found in the anterior medial region of the maxilla.⁴ Several theories have been put forward to describe the formation of supernumerary teeth, their etiology remains unclear.⁵ The occurrence of hyperdontia in various populations is reportedly between 0.1-3.8 percent with a male to female ratio of 2:1.⁶ Manifold supernumerary teeth are rare and usually seen in association with cleft lip/palate, Cleidocranial dysplasia, Gardner's

syndrome, and so forth.^{7,8} Supernumerary teeth may be classified according to their morphology (supplemental or rudimentary including conical, tuberculate, and molariform types) and location (mesiodens, paramolar, and distomolar). Detection of supernumerary teeth is finest achieved with a systematic clinical and radiographic examination. Many hitches can be associated with supernumeraries like crowding, delayed eruption, impaction, abnormal diastema, cystic lesions, ectopic eruption, root resorption of adjacent teeth, and so forth. Primary diagnosis allows an early intervention, a more favourable prognosis, and minimal complications.⁹ Hence purpose of the present study is to assess the prevalence, characteristics and gender distribution of supernumerary teeth among children aged 6 to 14 years residing in Udaipur city.

Methodology

A retrospective study was conducted using radiographs, (periapicals and panoramic) and study models of pediatric patients attending paediatric setup for a period of one year (August 2015 to July 2016). Study model and radiographic examinations were retrieved to explore the incidence of supernumerary teeth.

Ethical approval for the study was given by the ethical clearance committee, Pacific Dental College and Hospital, Udaipur. Exclusion criteria for the current study were patients with developmental anomalies such as cleft lip or palate, Down syndrome and those who had undergone orthodontic treatment previously.

Results

Of all 1257 patients presented with all the records, 27 (2.1%) patients were diagnosed with supernumerary teeth. Of all the subjects with the supernumerary teeth detected, of which 09 subjects in permanent dentition (7 males, 2 females), 14 in mixed dentition (10 males, 4 females) and 4 in primary dentition (3 males and one female). The majority of the subjects (n=21, 77.7%) revealed erupted supernumerary teeth, whereas few (n=5, 18.51%) had impacted and only one (03.7%) subject had both erupted as well as impacted supernumerary teeth.

19 subjects showed supernumerary teeth (70.3%) in the maxillary arch, 6 subjects (22.2%) in mandibular arch and 2 (07.4%) in both. The mesiodens was found to be the most common supernumerary teeth (70.3%), followed by paramolar (18.5%), distomolar (7.4%) and supplementary incisor (3.7%). The distribution of the supernumerary teeth among study sample have been shown in the (Table 1)

Discussion

Supernumerary is the term used to designate teeth in excess of the normal dental formula^{2,10,11} and may be asymptomatic and diagnosed during routine radiographic examinations or they may cause difficulties such as impaction; late or ectopic eruption of adjacent teeth; malocclusion or disruption of tooth spacing; and the development of follicular cysts or other disturbances of the oronasal environment.^{2,10,11-13} Supernumerary teeth may be found in link with a syndrome or in non-syndromic patients.^{14,15} While the etiology of supernumerary teeth is unclear, local and heredity factors have been considered as causes of this anomaly.^{2,16,17} Previous studies have been reported the recurrence of supernumerary teeth within the same family, thus supporting the significance of heredity as an etiological factor in supernumerary teeth formation.^{17,18} Latest studies have suggested environmental factors as well as a dichotomy of the tooth bud as other possible etiological factors.^{19,20} Koch et al.²¹ reported that 56% conical, 12% tubercular, and 11% supplemental and 12% other configurations among their patients.

In a study by Shah et al.²², 8 unerupted mandibular canines were found in 7886 individuals, and in another study by Grover et al.²³ 11 impacted mandibular canines were found in 5000 individuals, resulting in an incidence of 0.10%. Though there was no difference in the sex dissemination for impacted canines, the male to female incidence rate ratio was 1:1.3. This result is within the range from 1:1.3 to 1:3.2 as reported in other parallel study done by Jacobs et al.²⁴, indicating a higher prevalence of impacted canines among females.

Furthermore, supernumerary teeth are repeatedly linked with delayed eruption or impaction of permanent teeth, initial elimination is suggested to facilitate the spontaneous eruption of impacted permanent teeth.²⁵ Study done by Ashkenazi et al.²⁶ demonstrated that impulsive eruption of permanent teeth hinge on numerous variables like apex distance of the impacted tooth relative to its final position, extent of vertical impaction, morphology of supernumerary teeth, angle of impaction relative to midline, and time of surgery.

Conclusion

It has been established by this study that over all prevalence of supernumerary teeth is 2.1% in the Indian children of Udaipur city. Supernumerary teeth are more common in maxilla as compared to mandible. Most common supernumerary tooth is mesiodens followed by paramolar, distomolar, and supplemental tooth. Early recognition during the primary and mixed dentition periods would allow for more comprehensive long range treatment planning, favorable prognosis, minimize the need for extensive treatment and, therefore, is of special significance for dental practice.

Table 1: Distribution of supernumerary teeth among study sample

Total number of subjects with supernumerary teeth	N (27)	2.1%
Distribution of subjects based on arch involved		
Maxillary arch	19	70.3%
Mandibular arch	06	22.2%
Both	02	07.4%
Distribution of subjects based on number of supernumerary teeth		
One	18	66.6%
Two	07	25.9%
>Two	02	07.4%
Distribution of subjects based on eruption status		
Erupted	21	77.7%
Impacted	05	18.5%
Both	01	03.7%
Distribution of subjects with supernumerary teeth based on dentition		
Primary	09	33.3%
Mixed	14	51.8%
Permanent	04	14.8%
Distribution of subjects with supernumerary teeth based on type		
Mesiodens	19	70.3%
Supplemental	01	03.7%
Paramolar	05	18.5%
Distomolar	02	07.4%

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Original Research

Acceptance of Local Anesthesia for Cavity Preparation in Children in India

Priyanka Parmar

Postgraduate student
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Dinesh Rao B

Professor and Head
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Sunil Panwar

Reader
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Sachin Franklin

Senior lecturer
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Chetna Kumar

Postgraduate student
Department of Orthodontics &
Dentofacial Orthopaedics
Pacific Dental College & Hospital

Address for Correspondence:

Priyanka Parmar

Postgraduate student
Department of Paediatric Dentistry
Pacific Dental College & Hospital
Udaipur

Abstract

Background: Dental anxiety is a well-known barrier to dental treatment, commonly developing during childhood or adolescence. The interaction between dental anxiety and pain suggests that children respond petrified to pain and therefore are at an increased risk of ending up in the so called 'vicious cycle of anxiety'. If this cycle is not broken, a dreadful form of dental phobia might develop, resulting in ignorance for dental treatment. Local anesthesia may be introduced to minimize or prevent pain during cavity preparation. This, however, is not the norm among dental practitioners in India, owing to the anxiety that may be associated with the injection needle itself.

Aim and Objectives: To evaluate the use of local anesthesia for dentinal cavity preparation amongst paediatric dentists in India.

Materials and Methods: The present study is a descriptive, questionnaire study on a sample of 550 paediatric dentists in India. Questionnaires in English were designed and distributed using Survey Monkey app among paediatric dentists to seek information regarding the use of local anesthesia for cavity preparation in India. Results: Filled questionnaires were received from 375 practitioners and analysed. Only 10.9% paediatric dentists used local anesthesia and only 11% were in favor for using local anesthesia for painless dentinal cavity preparation.

Conclusion: It has been established by this study that it is not the norm among paediatric dental practitioners in India to use local anesthesia during dentinal cavity preparation, owing to the anxiety that may be associated with the injection needle itself.

Keywords: local anesthesia, dentinal cavity preparation, pediatric dental patient, pain.

Introduction

In Pediatric dentistry providing painless treatment is of great significance, as majority of patients visiting are anxious. Dental anxiety is a well-known barrier to treatment, commonly developing during childhood or adolescence. The interaction between dental anxiety and pain suggests that children who generally respond fearfully to pain are at higher risk of ending up in the so called 'vicious cycle of anxiety'. If this cycle is not broken, than a severe form of dental phobia might develop resulting in disregard for the dental

treatment. Anxiety associated with the conviction of visiting the dentist for preventive oral care and dental procedures is referred to as dental anxiety. It has been stated as the fifth-most common cause of anxiety by Agras et al. The dentin and pulpal component of the tooth react to various virulent stimuli including the one inflicted during restorative procedures. Clinically most obvious and immediate response of the tooth is pain. The aspiration of odontoblasts into the dentinal tubules as an immediate effect of physical stimuli when applied to exposed dentin seems to result from the loss of substance at the distal apertures of the tubules and also the subsequent outward flow of the tubular contents through capillary action. A hydro mechanical theory could account for the inexplicable sensitivity of the dentin to pain, in spite of no nerve fibers in this tissue. If movement occurs rapidly enough, displacement of tubular contents may lead to deformation of nerve fibers in the pulp or predentin or damage to the odontoblastic cells, both of which initiate pain.

Pain-free dental experience can be achieved by using local anesthesia while treating the patient. Its usage provide maximum comfortable treatment and the dentist is able to work calmly with concentration and precision. But many practitioners believe that using local anesthesia triggers anxiety to the maximum levels.

This study seeks to assess use of local anesthesia during cavity preparation in pediatric dental patients.

Materials and Method

The present study was a descriptive, questionnaire study carried out on a sample of 550 paediatric dentists in India, who met the inclusion criteria.

Online questionnaire in English were designed for paediatric dentists to seek information regarding their use of local anesthesia for cavity preparation in India. The questionnaire consisted of seven question areas including:

- 1) Use of local anesthesia during dentinal cavity preparation
- 2) Method of achieving local anesthesia
- 3) The effects of use of local anesthesia on child behavior during subsequent visits
- 4) Reasons for not using local anesthesia
- 5) Other methods used for painless dentinal cavity preparation
- 6) Effect of other techniques on child's behavior
- 7) Technique preferred by parents for painless dentinal cavity preparation

The questionnaire were distributed among paediatric dentists by using Survey Monkey application (Tables 1). The data obtained were tabulated and subjected to statistical

analysis using SPSS 22.0. The level for statistical significance was set at $p < 0.05$.

Results

The prepared questionnaire was sent to 550 paediatric dentists, out of which 375 (68%) dentists responded. Here only 41 (10.9%) paediatric dentists used local anesthesia for painless dentinal cavity preparation (graph 1).

Out of 41 paediatric dentists those who were in favor of using local anesthesia, only 4% used nerve block to achieve anesthesia, whereas rest 96% preferred using local infiltration method (graph 2).

Around 221 (66%) dentists were not in favor of using local anesthesia, because it makes child uncooperative for subsequent visits. And rest 34% were reported not using this method as it causes discomfort to the child (graph 3).

Further enquiring about the interest of parents, distraction technique was found to be the most preferred technique, followed by local anesthesia and lasers (graph 4).

Discussion

In this study, it was observed that the use of local anesthesia was less among paediatric dentists in India. Many dentists reported that use of local anesthesia would make child uncooperative for subsequent visits because it is discomforting to the child. Majority of paediatric dentists used distraction technique and lasers for painless dentinal cavity preparation.

It has been proposed that dental anxiety was related to pain occurring during dental procedures and the negative attitude of the dentist. Since dental anxiety often begins in childhood, a huge responsibilities lies on the dentist to alleviate the patient's fears and apprehensions and try to shape the initial appointment in the dental clinic as friendly and pain free as possible.

Literature states that dental drill was also responsible for elevating dental anxiety in children. For such patients using local anesthesia will be of no use to reduce dental anxiety. Use of electric driven handpiece that produces less sound may be considered. A significant number of patients (32%) also experienced anxiousness while they were about to get their teeth cleaned. This could be alleviated by explaining the procedure and showing videos related to the procedure in the waiting area. Effective counselling helps allay a patients fears to a large extent.

Many different types of techniques can be incorporated to reduce dental anxiety. Some of the commonly used means to minimize dental anxiety include cognitive-behavioral therapy, benzodiazepine medication, nitrous oxide sedation, music therapy, relaxation training, hypnotherapy, acupuncture therapy and the use of lavender oil scent. Although pharmacologic interventions can be promoted,

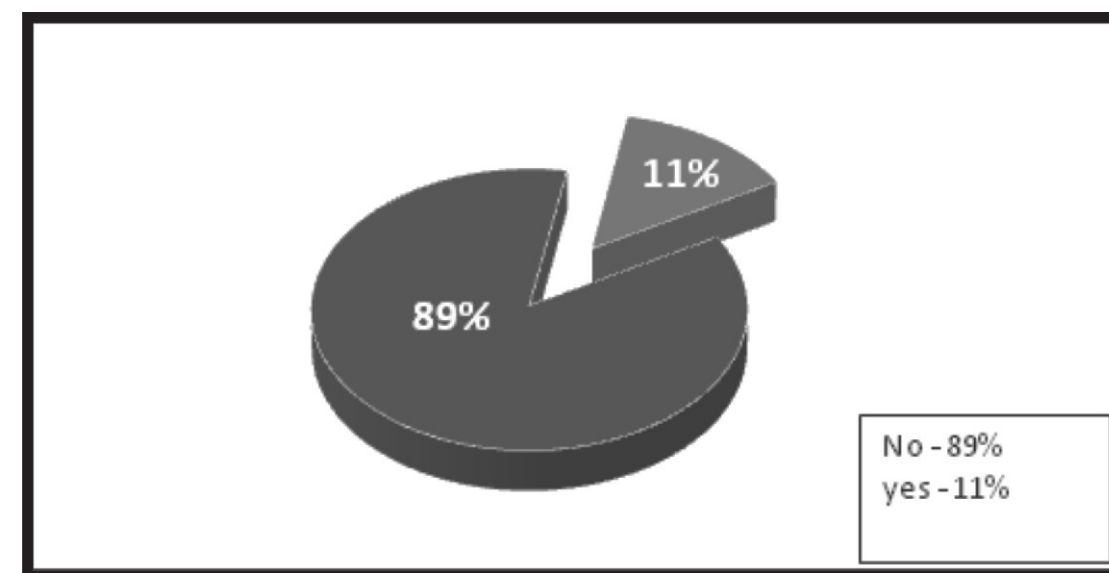
distraction is considered simple and yet effective technique that draws child's attention away from discomforting stimuli. Chemo-mechanical caries removal is also an effective alternative to conventional caries removal and is proved advantageous in patients who have phobia to the dental airtor and injections.

Conclusion

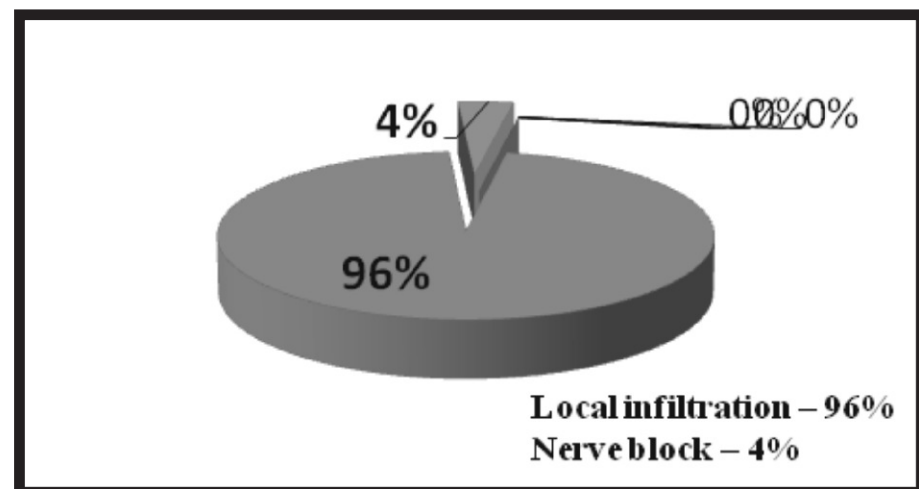
It has been established by this study that it is not the norm among paediatric dental practitioners in India to use local anesthesia during dentinal cavity preparation, owing to the anxiety that may be associated with the injection needle itself

Table 1: The questionnaire

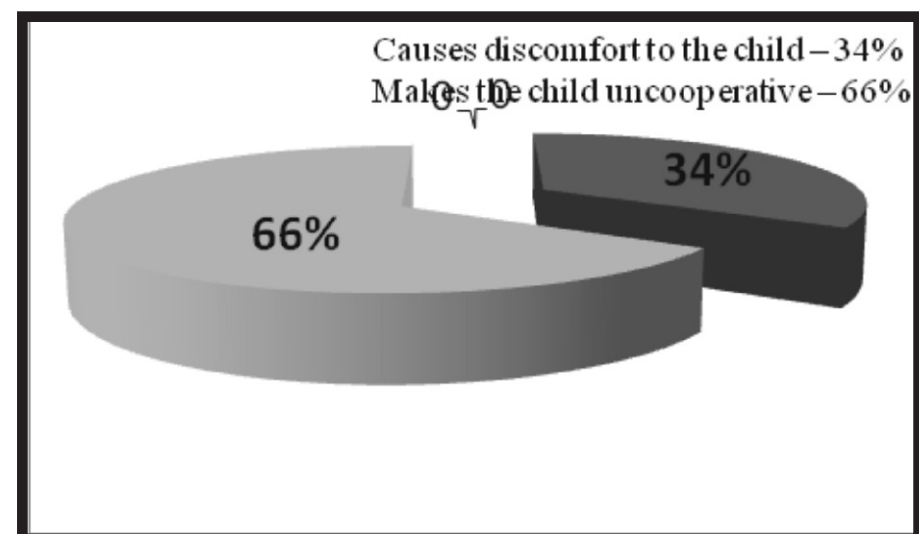
Sr no	Questions	Yes	No	Other
1	Are you in favor of using local anesthesia for dentinal cavity preparation amongst paediatric dental patients?			
If YES, please answer questions 1 and 2				
2	Which method of administration of local anesthesia do you prefer	Local anesthesia	Nerveblock	Other
3	Does this technique make the child reluctant to accept treatment in the subsequent visits?	Yes	No	Other
If NO, please answer questions 4-6				
4	Why don't you prefer local anesthesia as a painless technique for dentinal cavity preparation in paediatric patients?	Causes discomfort to the child	Makes child uncooperative	Other
5	Do you employ any other methods for painless dentinal cavity preparation in paediatric dental patients? (Name the technique)			
6	Do these techniques elicit child better cooperation?	Yes	No	Other



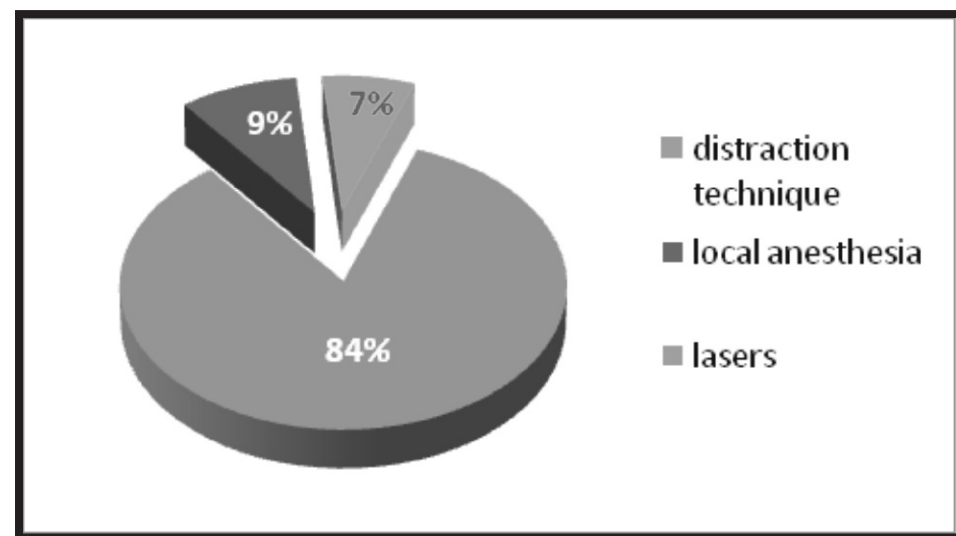
Graph 1: Response from Paediatric dentists



Graph 2: Preferred method of administration of local anesthesia



Graph 3: Reason for not using local anesthesia



Graph 4: Techniques preferred for painless dentinal cavity preparation (n = 375)

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Case Report

Mandibular Canine Impaction: A Case Report

Shanu Patel,

Post Graduate student,
Department of Orthodontics,
Pacific Dental College and Hospital,
Udaipur

Namit Nagar,

Reader,
Department of Orthodontics,
Pacific Dental College and Hospital,
Udaipur

Sumer Chand Meena,

Post Graduate student,
Department of Orthodontics,
Pacific Dental College and Hospital,
Udaipur

Abhijeet Masih,

Post Graduate student,
Department of Oral surgery,
Pacific Dental College and Hospital,
Udaipur

Krishna Prakash,

Post Graduate student,
Department of Orthodontics,
Darshan Dental College and Hospital,
Udaipur

Address for Correspondence:

Shanu Patel,

Post Graduate student
Department of Orthodontics,
Pacific Dental College and Hospital,
Udaipur

Abstract

Impacted teeth are those that have not erupted during the time of their normal eruption and remain in the jaws where they are surrounded completely or partially by hard or soft tissues. Since impacted canines are encountered often, with an incidence rate of 1 to 2 % in the general population. A 16 year old female patient presented with an irregularly placed upper and lower front teeth. The panoramic radiograph revealed mandibular left canine impacted. Non-extraction treatment plan followed by surgical exposure of 33. The comprehensive orthodontic treatment procedure with surgical exposure of mandibular left canine. However, this clinical report highlights the need for early diagnosis and management of mandibular left canine.

Keywords: Impacted Canine, Mandibular canine impaction, surgical exposure

Introduction

Impacted teeth are those, which are prevented from erupting by some physical barrier, in the eruption path and remain in the jaws, surrounded completely or partially by hard or soft tissues. The incidence rate of 0.8 to 2.3% has been reported for impaction of maxillary permanent canines.¹ The prevalence in adult of impaction of mandibular canines has been reported from 0.05 to 0.4%.²

The locations of impacted mandibular canines are common in the labial aspect of the dental arch than compared to maxillary canines.^{3,4} Various treatment options for impacted mandibular canines including surgical removal, exposure and orthodontic alignment, transplantation and observation.

The purpose of this case report is to describe the diagnosis and management of impacted mandibular canine by surgical exposure and orthodontic treatment mechanics.

Case Report

A 16 year adolescent female presented with an irregularly placed upper and lower front teeth. She was in good general health and had no history of major systemic diseases. The temporomandibular joint evaluation showed no signs of clicks or crepitation. The extra oral examination revealed a straight profile with competent lips. There were no gross asymmetries. The intraoral examination showed an Angle's Class I malocclusion. The mandibular left canine was impacted. The

maxillary and mandibular arch showed mild spacing with overbite of 1mm and reverse overjet 11 and 42. (Figure 1 and 2)

Cephalometrically, the patient had a Class III skeletal relationship (ANB angle: -1°) with mandibular prognathism. A horizontal growth pattern was seen (SN.GoGn: 26°). Maxillary incisors were proclined with the upper incisor – NA of 114° . The lower incisors were upright with an IMPA of 93° . The panoramic radiograph showed all permanent teeth erupted except maxillary and mandibular third molars. The mandibular left canine was impacted. (Figure 3) The commonly used radiograph for diagnosis of impacted canine includes OPG, occlusal view and Intraoral periapical radiograph. Apart from these PA and lateral cephalogram and CBCT were also used in selected cases.

Treatment Objectives

The initial treatment objectives were surgical exposure of the mandibular left canine and bring it into alignment. The orthodontic procedure would align the maxillary and mandibular dental arches. Our treatment objective also included correcting the Class I incisor relationship. The comprehensive treatment objectives were to establish good functional and stable occlusion and to improve the smile characteristics and dental esthetics.

Treatment plan

1. Non extraction treatment plan followed by surgical exposure of 33 and alignment of the same in the arch.

Treatment progress

The case was started with MBT 0.022" slot pre adjusted edgewise appliance. The initial alignment was achieved with 0.016" NiTi arch wire. The leveling was carried out with 0.018" AJ Wilcock arch wire and impacted mandibular canine was surgically exposed with full thickness flap under local anesthesia. The bracket was bonded on exposed canine and ligature wire was tied (Figure 4) Elastic traction was given from the ligature wire attached to the bracket on the exposed canine. In order to bring the mandibular left canine in the arch, a overlay ("Piggy Back") wire of 0.014" NiTi, over the 0.017 X 0.025" Stainless steel base arch wire was engaged on the bracket of the mandibular left canine (Figure

5). The alignment and leveling was completed with 0.019 X 0.025" NiTi and 0.019 X 0.025" stainless steel archwires. It took 14 month to bring the canine into the arch. (Figure 6)

Treatment result

Intraorally, ideal overjet and overbite was achieved with Class I molar and canine relationship with consonant smile arc. The radiograph showed good bone support and root parallelism.

Discussion

Impacted permanent mandibular canine are detected quite regularly in the clinical and radiographic examination of a young dental patient. The most important step in the management of impacted teeth is the diagnosis and localization of impacted teeth. Failure of eruption of the mandibular canine is an unusual event.^{4,5} There is very few number of studies revealing the occurrence of mandibular canine impactions.⁴

Delayed tooth eruption can cause necrosis of the pulp, ankylosis and external apical root resorption. It is difficult to predict when root resorption will start. Thus, all impacted teeth having a high risk of external apical root resorption or damage to the adjacent tooth. Periodically radiographic examinations should be used to monitor the impacted canine for above risk.^{6,7}

The surgical extraction of impacted mandibular canines are the most favored treatment, rather than a heroic effort to bring the tooth back to its original place.⁸ In our case, the canine was in favorable position, and since canines are considered important keystones in the dental arch, we decided to orthodontically bring it into most ideal position.

Therefore, a good knowledge of the clinician may improve situation in future treatment options, which can have a significant impact on the treatment outcome.

Conclusion

Satisfactory functional and esthetic results were achieved in this case with ideal skeletal and dental relationships. The combined effect of surgical exposure of impacted mandibular canine and orthodontically correcting its positing and reestablishing the major components of a balanced smile.

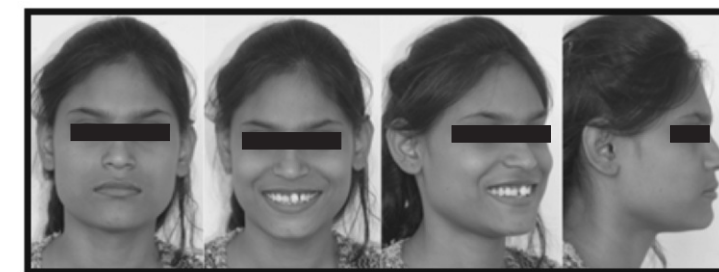


Figure 1: Pre-treatment Extraoral photographs

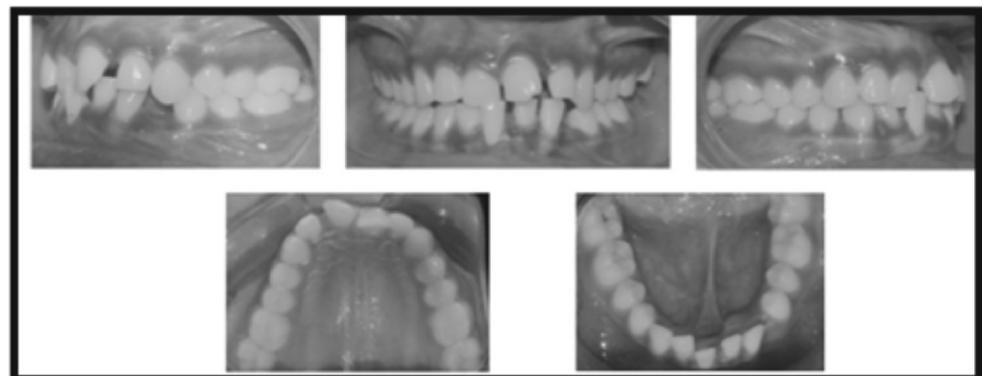


Figure 2: Pre-treatment Intraoral photographs

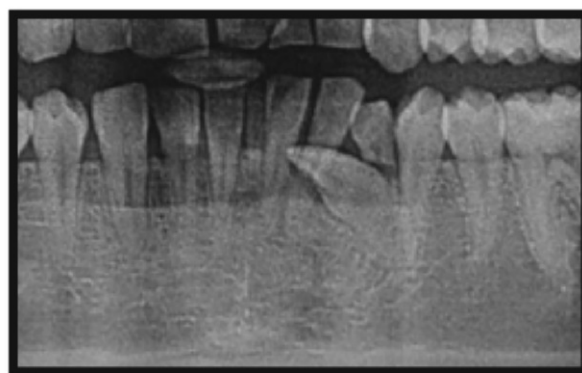


Figure 3: Showing close up OPG. Note the horizontal position of 33

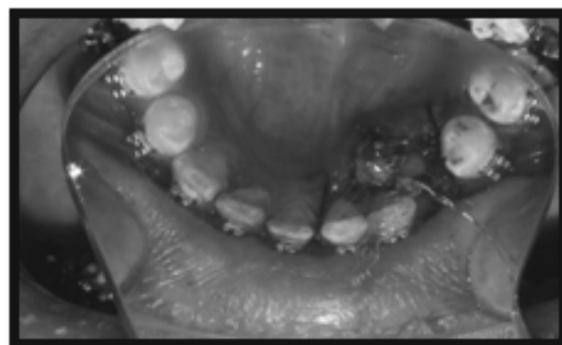


Figure 4: Surgical exposure of impacted tooth and bonding of bracket

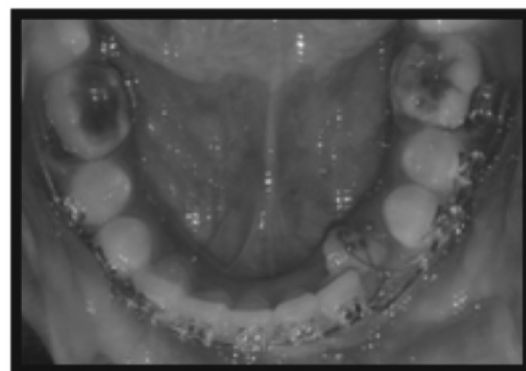


Figure 5: "Piggy Back" wire of 0.014 NiTi, over the 0.017 X 0.025 Stainless steel engaged on the bracket of the mandibular left canine

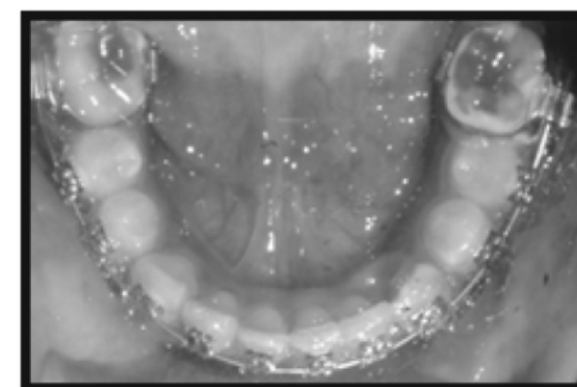


Figure 6: Mandibular left canine after 14 month

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Case Report

A Unique Technique of Restoring Fractured Anterior Teeth Using Template Method

Krutika Mistry

Postgraduate student
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Dinesh Rao B

Professor and Head
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Sunil Panwar

Reader
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Sachin Franklin

Senior lecturer
Department of Paediatric Dentistry
Pacific Dental College & Hospital

Address for Correspondence:

Krutika Mistry

Postgraduate student
Department of Paediatric Dentistry
Pacific Dental College & Hospital
Udaipur

Abstract

Children and adolescent are prone to trauma. Dental trauma may happen because of a sports mishap, a fall while playing, or other causes. Trauma associated with fracture of permanent anterior teeth is an unfortunate occurrence for the pediatric patient and creates a mental and emotional impact on both the parents and youngsters. Complexity in managing a fractured anterior tooth, the current technique of restoring using template method proved as an easy, cost-effective and suitable procedure which will justify all the requirements of aesthetic dentistry.

Keywords: Trauma, Uncomplicated crown fracture tooth, Polyvinyl siloxane, Template

Introduction

Variation was unavoidable. Mass media has caused people to realize more and more regarding aesthetic smile. This has caused our profession to seek a definitive cosmetic restoration an ideal technique for achieving of desired aesthetic. Diversity and revision were showed with time. Numerous procedure and restorative materials were tried and discarded. Advancement was stumbling.¹

Dentoalveolar fracture is the most well-known type of head and neck trauma. Dental trauma may happen because of a sports mishap, a fall while playing, or other causes. Traumatic injuries to teeth and their associated structures can take place in any age group, but children are most common candidate followed by adolescents; with males showed more probability than females, because of activeness and risky sports of children.^{2,3} Mutilation from trauma to dearticulation may involve pulp or osseous fracture.³

The teeth utmost usually affected by trauma are the maxillary incisor which was reported as 96% of all the crown fractures of which 80% central incisor and 16% lateral incisor are seen.⁴ Anterior anatomic crown fractures are a usually site of trauma. Uncomplicated crown fracture of the permanent teeth has a strong consequences not only on the patient's looks and also psychological effects; speaking defects and social effects.⁵ The treatment for such trauma depends upon whether the injured tooth is of primary or permanent dentition and the type of injury. Treating a young adult with fractured anterior dentition offers a great encounter to the dental professionals both from a functional and

aesthetic perceptive.⁶ Definitive management is essential for the well-being of the dentoalveolar fracture.

The current case report describes an innovative procedure in rehabilitating uncomplicated fractured maxillary central incisors teeth in a pediatric patient with composite resin material. It is easily available, cost-effective and requires a lesser amount of operating time with direct technique.

Case Report

A 12-year-old male came to the Department of Paediatric Dentistry, Pacific Dental College & Hospital, and Udaipur, with chief complaint of broken upper front teeth. The history revealed of trauma to upper front teeth about 6 days back, due to a fall during playing. Extraoral examination revealed no gross facial abnormality nor any wound. Intraoral examination revealed Ellis class II (uncomplicated) fractured tooth 11 and Ellis class I fractured tooth 21 (Figure 1). These teeth and related soft or hard tissue injuries were asymptomatic and reacted well to electric pulp tester, indicating positive teeth vitality. Intraoral periapical radiograph confirmed the absence of pulpal or periapical pathology (Figure 2). Thus, it was planned to rehabilitate the traumatized teeth using composite resin material, with a direct technique using the template.

A 45° bevel was made for removing the unsupported enamel and which increased the surface area. Primary impressions of the maxillary and mandibular arches were made using irreversible hydrocolloid i.e. alginate material (Chromatic Jeltrate, Dentsply, Gurgaon). Study casts were prepared in Type III dental stone (Neelkanth, Jodhpur) and mock build-up of the lost fragment of teeth with modeling wax (Y-Dents, MDM Corporation, New Delhi) was prepared. Putty index was fabricated on the cast using elastomeric impression material (Aquasil, Dentsply, Germany). Labial surface of the template made of putty index was removed up to the middle third of the crown, which benefits in the restoration of the fractured tooth structure (Figure 3). Clinically, in order to ensure a satisfactory fit, try-in of the template was done inside the oral cavity. After apt selection of shade of the composite resin material (Spectrum®, Dentsply, Germany), this template was used to restore the traumatized teeth swiftly with minimal finishing. (Figure 4).

Discussion

Trauma along with fracture of a permanent incisor is a terrible acquaintance for the paediatric patient and creates a mental as well as emotional brunt on both the parents and children.² There is a change in the child's appearance and makes him the object for teasing by peers.

Treatment goals may vary depending on intraoral

examination at the time of treatment planning, socioeconomic status of the patient and the age of the patient.⁷ Numerous treatment options are available, for restoration of traumatized teeth like composite resin restoration, reattachment of the fracture fragment (if available) followed by post and core held restorations and fixed prosthesis.^{7,9} Mostly restorative management like full-coverage restoration or laminate veneers can be considered after multiple fragment rebonding/ composite resin restorations have been done but this option is no longer functional. These methods might have a tendency to lose the sound tooth enamel and dentin and challenge the dental professional to achieve desired aesthetic with the nearby sound teeth.¹⁰

Management of the young patient with front tooth fracture offers a great challenge to the dental professional both starting from an aesthetic and functional perceptive. The expected aesthetic restoration of the fracture incisal edge of maxillary anterior is a difficult as well as the technique sensitive.⁶ Incremental composite resin build up restoration to achieve precise combinations of opaques and tints, an illusion of varying opacities and translucency to match desired aesthetics.¹¹

These anterior composite resin restorative materials offer a cost-effective management alternative among young adults with fractured dentition, where aesthetics is a most important concern. With advancement in restorative dentistry we will be able to achieve near to perfect aesthetic due to further improvements in bonding chemistry and the polishing system.⁹

In the current case, an innovative technique which comprises both indirect and direct technique of rehabilitating using putty index which is polyvinyl siloxane rubber base impression material. When compared to other invasive procedures, this technique is easy, fast and cost-effective. The use of the polyvinyl siloxane rubber template offers incremental layering of the composite restorative material, optimal depth of curing, precise contours with least finishing.^{12,13}

Conclusion

Template method using direct composite restorative materials magnificently manage the aesthetic problems of maxillary anterior teeth in addition to the painless approach resulting in greater satisfaction for the patient as well as a successful outcome for the dental professional. Despite of complexity in managing a fractured anterior tooth, the current technique of restoring using template method proved as an easy, cost-effective and apt procedure which will fulfill all the necessities of aesthetic dentistry.

Figures

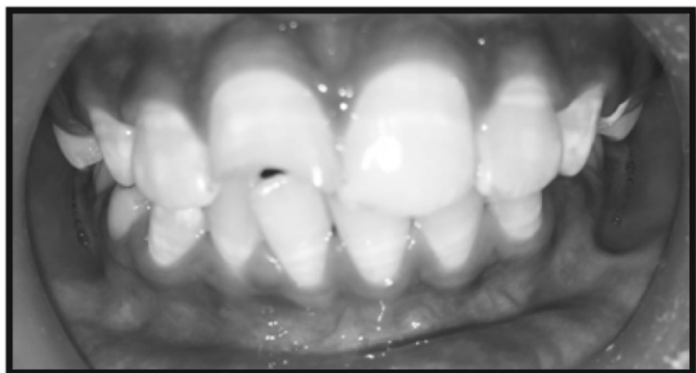


Figure 1: Pre-operative view



Figure 2: Intraoral periapical radiograph

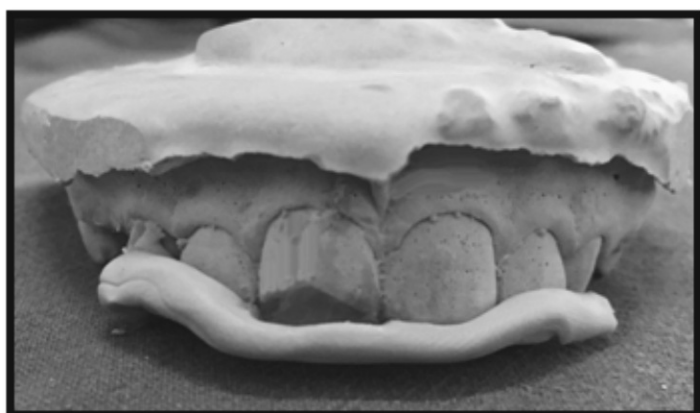


Figure 3: Putty template on cast

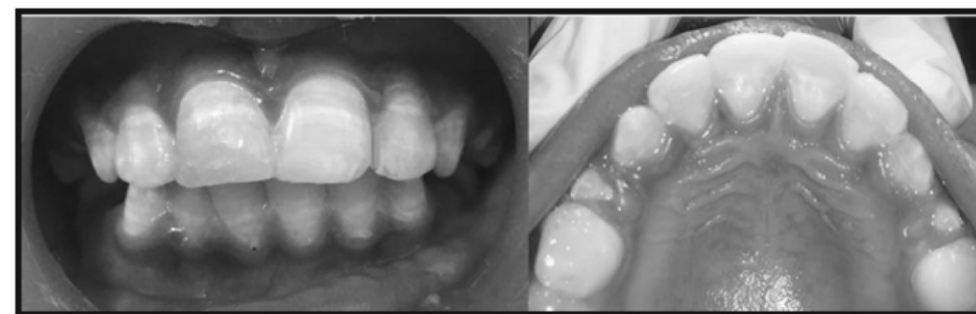


Figure 4 (A & B): Post-operative view

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Case Report

Radiopaque mass extending into the maxillary sinus: A rare case report

Ravleen Nagi,

Reader,
Dept. of Oral Medicine and Radiology,
New Horizon Dental College & Research Institute,
Sakri, Bilaspur, Chhattisgarh

Supreet Jain,

Senior Lecturer,
Dept. of Oral Medicine and Radiology,
New Horizon Dental College & Research Institute,
Sakri, Bilaspur, Chhattisgarh

Yash Agrawal,

PG Student,
Dept. of Oral Medicine and Radiology,
New Horizon Dental College & Research Institute,
Sakri, Bilaspur, Chhattisgarh

Akanksha Yadav,

PG Student,
Dept. of Oral Medicine and Radiology,
New Horizon Dental College & Research Institute,
Sakri, Bilaspur, Chhattisgarh

Juhi Bhandari,

PG Student,
Dept. of Oral Medicine and Radiology,
New Horizon Dental College & Research Institute,
Sakri, Bilaspur, Chhattisgarh

Ankita Giri,

PG Student,
Dept. of Oral Medicine and Radiology,
New Horizon Dental College & Research Institute,
Sakri, Bilaspur, Chhattisgarh

Address for Correspondence:

Supreet Jain,

Senior Lecturer,
Dept. of Oral Medicine and Radiology,
New Horizon Dental College & Research Institute,
Sakri, Bilaspur, Chhattisgarh

Abstract

Odontomas are benign odontogenic hamartoma composed of epithelial and mesenchymal tissue. They are classified histologically into 'compound' and 'complex' odontoma. They are usually asymptomatic although sometimes pain, infection and swelling may occur due to their presence. They are usually discovered as incidental findings on routine radiographs and could impede the eruption of impacted or unerupted tooth or may also expand cortex or involve the maxillary sinus. This paper describes a case of 18 year old male with yellowish hard immobile mass distal to right maxillary second molar. Provisional Diagnosis of complex odontome was made and mass was further diagnosed by conventional radiographs and computed tomography where dumbbell shaped radiopaque mass was seen involving half of the right maxillary sinus. The mass was surgically excised and after two months follow up no recurrence of the pathology was noticed.

Keywords: complex odontome, computed tomography, maxillary sinus, non-aggressive, surgical excision

Introduction

Odontomas are hamartomatous benign tumors (not true neoplasms) mainly composed of dental tissues such as enamel and dentin but can have variable amounts of pulpal tissue and cementum.¹ Paul Brauca in 1866 first used the term 'odontoma' and defined it as 'the tumors formed by the overgrowth of transitory or complete dental tissues'.² World Health Organization (WHO) in 2005 has classified odontomas based on histopathological findings into 'complex odontomas' in which dental tissues are well formed but exhibit more or less disorderly arrangement; 'compound odontomas' in which dental tissues are arranged in more orderly pattern so that they resemble tooth like structures; and 'ameloblastic fibro-odontome' which consists of variable amounts of calcified dental tissue and dental papillae like tissue resembling ameloblastic fibroma. It is an immature precursor of complex odontome.³ The incidence of occurrence of complex and compound odontomas is 1:2.¹ Although the etiology of odontomas are unknown but local trauma, infection, genetic factors, cell rests of serres, hereditary anomalies (Gardner's syndrome, Hermann's syndrome), odontoblastic hyperactivity have been hypothesized as contributing factors for development of lesion.^[3,4] Here we present a

case of 18 year old male patient with yellowish white hard mass present distal to right maxillary second molar occupying half of right maxillary sinus.

Case Report

An 18 year old male reported to the department of Oral Medicine and Radiology with the chief complaint of pain in the upper right posterior tooth region since 2 days. Pain was sudden in onset; dull, intermittent in nature with no history of associated swelling. Patient's medical and family history was not relevant. Intraoral examination revealed rough yellowish white bony hard, immobile mass distal to right maxillary second molar of approximately 1x1 cm in size (Figure 1a). On the basis of clinical examination, provisional diagnosis of complex odontome distal to right maxillary second molar, 17 was made. Compound odontoma, osteoma, cementoblastoma, and calcifying epithelial odontogenic tumor were considered under differential diagnosis.

Routine conventional radiographs and computed tomography (CT) for the patient were performed. Panoramic radiograph revealed round to oval shaped radiopaque mass distal to 17 (dumbbell appearance) measuring 5x3 cm approximately extending from alveolar process to inferior orbital margin superoinferiorly and from mesial root of 17 to posterior border of maxillary sinus antero-posteriorly. Posteroanterior view of the patient also showed radiopaque mass extending mediolaterally from right lateral wall of nasal cavity till posterior border of right maxillary sinus and superiorly from infraorbital margin till middle third of right maxillary sinus (Figure 1 b,c). CT scan (coronal view) revealed hyperdense well defined mass, roughly dumbbell shape measuring 5x3 cm approximately extending within the right maxillary sinus and covering half of the sinus with expansion of the buccal cortical plate and erosion of the infraorbital margin (Figure 2 a,b). All the hematological parameters were within normal limits.

Surgical excision and curettage was done under General Anesthesia followed by antibiotic coverage. The excised specimen was sent for histopathological examination (Figure 3 a,b). Decalcified biopsy section of the specimen showed disorganized dental tissue composed of irregular dentin masses containing multiple hollow circular spaces with pulpal tissue, calcified small spicules that looked like cementum and enamel matrix. All the features were suggestive of complex composite odontome. After 2 months of follow up, patient was asymptomatic. Follow up panoramic radiograph was normal (Figure 3c).

Discussion

Odontomas are hamartomatous developmental benign tumors of the jaws which are usually slow growing, nonaggressive and found incidentally on routine

radiographic examinations.⁵ They are common in second decade of life, are generally asymptomatic but sometimes signs and symptoms of pain and swelling occur due to their presence.^[3] In our case the patient was 18 years old and the lesion was associated with symptoms of local pain. Their association with unerupted, impacted and retained deciduous teeth has been well documented. Odontomes impede the eruption of impacted teeth into the oral cavity leading to malpositioning of adjacent teeth. They may also cause cortical expansion.^{1,6,7} In this case odontome was distal to 17 and was not associated with any impacted or unerupted teeth but cortical expansion was observed on CT scan.

Various classifications have been proposed in the literature for this anomaly. In general odontomas could be extra osseous (peripheral) and intraosseous (erupted odontome).³ WHO has classified odontomas into compound, complex and ameloblastic fibro-odontome. A new variant 'hybrid odontome' has also been reported in the literature.^{1,3} Thoma and Goldman in 1946 divided odontomes into Geminated composite odontomes, in which two or more, more or less well developed teeth fuse together; compound composite odontome which is made up of more or less rudimentary teeth; complex composite odontome in which calcified structure bears no resemblance to the normal arrangement of dental tissues; Dilated odontomes, in which crown or root part of tooth shows marked enlargement; cystic odontomes, an odontome that is normally encapsulated by fibrous tissue.⁸⁻¹⁰

The incidence of compound odontomas in the anterior segment of jaws was 61% and that of complex odontomas in the posterior segment of jaws was 34%.⁵ Mostly odontomas are common on right side of jaw than left side and in our patient yellowish hard mass was present on right maxillary posterior segment i.e distal to 17 and it was diagnosed as complex odontome as it showed no resemblance to normal tooth like structures and was hard on palpation. Radiographic findings of present case were comparable to diagnosed cases of Sotobori M et al¹¹ and Arunkumar KV et al³ in which odontome was seen as hyperdense mass in maxillary sinus on CT although there was no association with impacted tooth or effect on sinus lining in our case.

It is important for a dental clinician to distinguish complex composite odontome from compound odontoma, osteoma, cementoblastoma and calcifying epithelial odontogenic tumor. Radiographic method is the best clinical method to differentiate between compound and complex odontomas. Compound odontomas consists of well-organized malformed tooth like structures are usually radiolucent cyst like lesion but complex odontomas consists of irregularly shaped oval radiopaque mass surrounded by radiolucent rim.¹² cementoblastoma is a odontogenic neoplasm and is characterized radiographically as a well-defined radiopaque

mass attached to the tooth root mostly mandibular first molar and surrounded by radiolucent capsule. In some cases they may cause root resorption but the involved tooth remains vital.¹³ Cranio-facial osteomas are usually asymptomatic but as the size increases, may occlude sinus ostium leading to retention of secretion and onset of sinusitis. Radiographically they are characterized by more or less homogeneous radiopaque mass attached to the sinus wall with a small pedunculated stem.⁶ Calcifying epithelial odontogenic tumor is a rare odontogenic neoplasm found in males above 40 years of age, common in premolar molar area, associated with impacted or unerupted teeth like odontomes. But radiographically they are unilocular or multilocular in appearance. In the early stages the lesion is radiolucent but later foci of radiopacities appear close to impacted tooth.¹⁴

Although they have limited growth potential should be diagnosed early to prevent future complications as they could impede eruption of unerupted or impacted teeth and cystic transformation may occur.^{5,6} These lesions are

surgically treated by simple local excision and usually do not recur. However it may be difficult to manage large complex odontoma especially in posterior maxilla which requires proper lip cheek retraction and employment of large triangular or trapezoidal mucoperiosteal flap under general anesthesia.⁷ In the present case it was removed by intraoral approach under general anesthesia and after 2 months follow up patient was asymptomatic.

Conclusion

Odontomes are benign odontogenic neoplasm which is slow growing, non-aggressive, usually asymptomatic and incidentally discovered on routine radiographs. Sometimes signs and symptoms of pain, swelling, infection could occur due to their presence. These pathologies could also involve maxillary sinuses as noticed in our patient. Clinicians should diagnose these lesions with routine radiographs and surgically remove these pathologies at an early stage to prevent the development of future complications. Early treatment ensures better prognosis of the patient, prevents the chances of recurrence and reduces the cost of treatment.

Figures

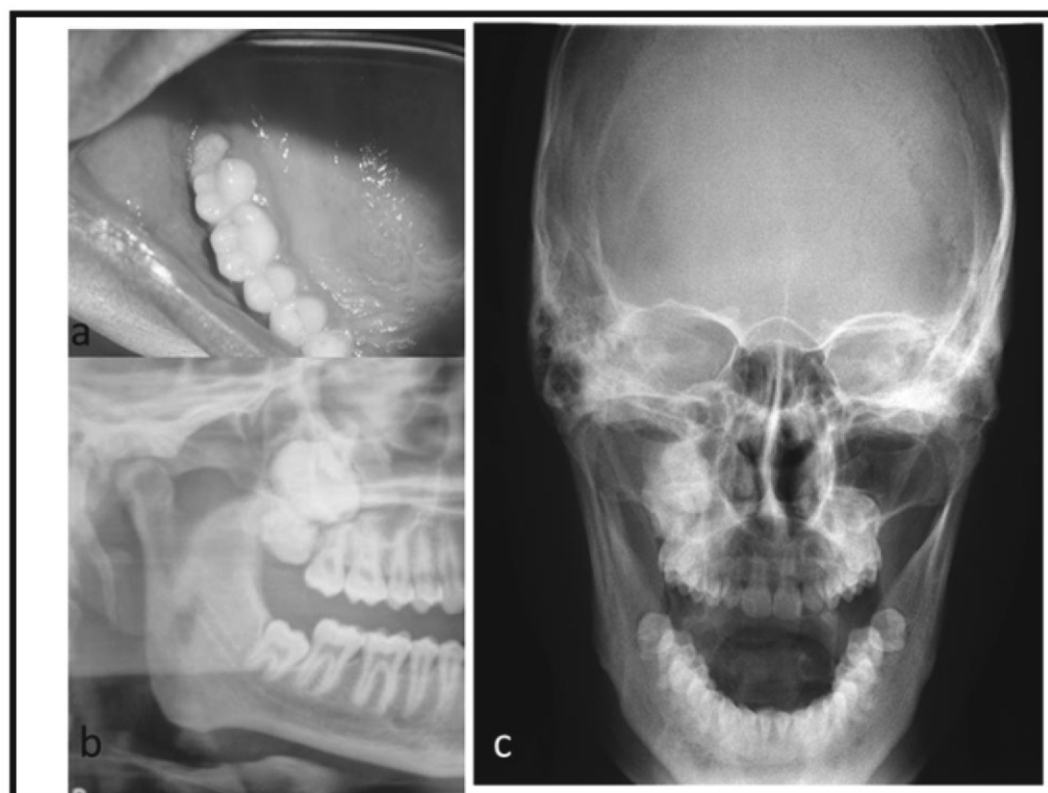


Figure 1 (a) Intraoral preoperative photograph showing yellowish hard immobile mass distal to right maxillary second molar (b) Preoperative panoramic radiograph with dumbbell shaped radiopaque mass occupying half of right maxillary sinus (c) Posteroanterior view showing radiopaque mass occupying maxillary sinus



Figure 2 (a) Computed tomography (coronal view) showing hyperdense mass occupying half of right maxillary sinus with cortical expansion (b) 3-D reconstruction

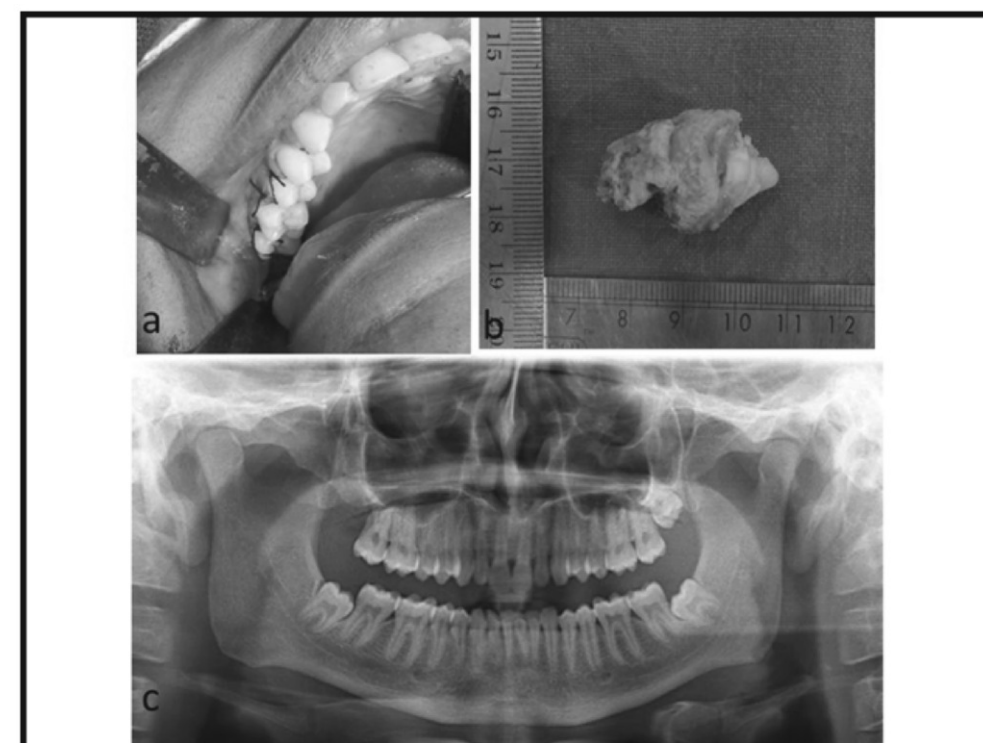


Figure 3 (a) Intra-Operative photograph (b) Excised specimen measuring 5x3 cm (c) Postoperative intraoral 2 month follow up photograph of patient.

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Case Report**Immediate denture: A case Report****Tushar Chauhan**

Postgraduate Student,
Department of Prosthodontics,
Pacific Dental College and Hospital,
Udaipur, Rajasthan, India.

DRV Kumar.,

Professor,
Department of Prosthodontics,
Pacific Dental College and Hospital, Debari,
Udaipur, Rajasthan, India.

Tushar Bansal,

Private practitioner,
Ujjain, Madhya Pradesh,
India.

Divya Chhajlani,

Sr Lec.
Department of Prosthodontics,
Pacific Dental College and Hospital and
Research Centre, bedla, Udaipur, Rajasthan

Sheenam Sirohi

Post-graduate student,
Department of Prosthodontics,
Pacific Dental College and Hospital, Debari,
Udaipur, Rajasthan, India.

Address for Correspondence:**Tushar Chauhan**

Postgraduate Student,
Department of Prosthodontics,
Pacific Dental College and Hospital,
Udaipur, Rajasthan, India.

Abstract

An immediate placement complete denture is a restore of the lost natural teeth which is inserted into the patients mouth at once after the extraction of present teeth or all. The removal of all the teeth and placement of the conventional removable prosthesis are important in patient's life. The transition from dentulism to edentulism should be psychologically atraumatic as far as possible. The cases presented here are conventional (classic) immediate denture which offer good esthetic and functions.

Keywords: Conventional immediate denture, Classic immediate denture, Immediate removable prosthesis.

Introduction

A removable complete prosthesis is a prosthesis which is fabricated restore to replace teeth and replica of oral tissue prior to the extraction of present or all teeth.

These prosthesis acts as the substitute in both arch. There are some limitations prosthesis in systemic condition and that effect blood clotting, acute periapical or extensive periodontal diseases, Indifferent unappreciative patients and Emotionally disturbed individuals.¹

The loss of teeth in an individual can lead to improper mastication, digestion, phonation and it may also affect the appearance of the patient leading to the psychological trauma to the patient. The tooth loss can occur due to these several reasons such as diseases of dentition, congenital absence, trauma, various systemic diseases, and even as a mechanical failure. To assuage these problems, various treatment alternatives have been already developing such as removable partial dentures, and fixed bridges but these methods still have lacunae's which make these methods unfavourable to the patients. For the same dental implants are stronger, functionally effective and more durable.²

Advantages Of Immediate Denture:¹

1. Main advantages of immediate denture it maintains patient appearance with less affect in muscle tone, circumoral support, maxillomandibular relations, and facial height can be maintained.
2. The tongue will not expand at the period of edentulism.
3. It leads better healing because it acts as surgical stent by applying continue pressure to soft tissue to facilitate healing and to prevent

cicatrization or tissue collapse which produce blood clot thereby reducing bleeding.

4. Patient does not develop undesirable masticatory habits and at the same time, patient is likely to adapt more easily to denture when recovery from surgery is progressing.

Disadvantages Of Immediate Denture:²

1. Complexity of treatment is high and it takes several appointments.
2. After extraction, rapid resorption of the alveolar process occurs and 8-12 months are required to become a more stable form. Therefore, immediate denture should be relined or remade.
3. Aesthetics and phonetics qualities of trial dentures are limited by the presence of natural teeth and cannot be evaluated truly until denture placement.
 - Patients is very confident for their demand. To attain the maximum degree of success, the following requirements should be satisfied: 1) similarity to oral structure; 2) restore the masticatory; 3) symmetry with all functions including deglutination 4) aesthetic solution and 5) maintenance of the oral structure.⁴

For the dental surgeon it is a questionable thing to fulfil patients desire and for it, primary concern is assessing the patient on an individual basis.

The subjects of immediate removable prosthesis should be logical type so, control dispute and organize practice in an orderly manner. They conquer annoyance and used to adapt swiftly. These patients should follow dictate in canny manner. These outlooks donate to a favourable prognosis for removable immediate prosthesis.

Case report

A 40-year-old woman reported to department of prosthodontics with chief complain of mobility in present teeth with no present medical terminology. The integral examination reveals that present of right first premolar and left later incisor, canine and second premolar in maxillary arch and right first premolar and left canine and second premolar present in mandibular arch. All the present teeth had poor prognosis with gingival recession and poor bone support resulted with mobility and She presented complete edentulous mandible arch the patient was determined for not being without teeth. She was very concern and philosophical type.

After complete examination, the patient was scheduled for the classic immediate prosthesis due to present of vertical stop was present in right side with premolar and left side with canine. Standard procedure for classic immediate prosthesis was performed.

Extra oral and intra oral enprint of the patient were made (Figure 1). Face negative reveals profile and frontal view. Intra imprints of upper and lower jaw with teeth were made which helps in shade selection. At present vertical dimension occlusion were recorded and noted down.

Impression of maxillary and mandibular arch were made with alginate impression material and primary casts were made.

A custom tray for both the arches were made on the primary cast using Campagna technique (Figure 2 & 3).

Advantages of Campagna Impression Technique

- This impression technique uses a custom tray with a labial flange.
- The remaining anterior teeth are not covered by the custom impression tray.
- This tray allows accurate border moulding of all border areas.
- Following border moulding, an impression is made of all the border and denture foundation areas. The main advantage of this technique has over the combination impression technique is the potential for more accurate impression of the labial vestibule.

Border moulding was performed and final impression was made of the maxillary arch and mandibular arch with zinc oxide impression material. And pick up impression made using irreversible hydrocolloid (Figure 4 & 5). Master cast was poured with type IV die stone material, record base and occlusal rim were fabricated and jaw relation established at present vertical and horizontal relation (Figure 6 & 7).

The genuine shade and size of teeth were selected, according to present teeth as a guide. The posterior teeth arrangement was done and tried in the patient's mouth to secure jaw relation records. The wax-up was done. Anterior teeth were arranged. Ridge is evaluated and approximated what ridge shape will be after removing teeth on the stone model, then according to Frank C JERBI, it is a modification of Kelly's "Rule of thirds" technique where labial aspect of tooth was divided into three equal bands of space between gingival line and depth of vestibular space, i.e. gingival, middle and vestibular bands (Figure 8 & 9).

Teeth arrangement and wax-up were done, the surgical template was fabricated on trimmed cast which were served as a replica of cast to ensure that bone trimming is done accurate manner. The template should fit and be in contact with all tissue surfaces.

Extraction were performed (Figure 10) followed by acrylic denture were placed in patient mouth, and instruction were given to patient (Figure 11).

First 24 hours - The patient is directed for not to remove the

prosthesis from the mouth in insertion of 24 hours.

- Patients should avoid wash of prosthesis and stay away from consume hot beverage or alcohol.
- Diet for 1 day of insertion should be crash diet or soft appropriate with pain relieve medicine .

Post insertion care : One day of insertion occlusion is reverified Asked the patients where they feel sore .

- Remove the denture and wash it with mouth wash .
- Quickly check the tissue for sore spots relate to the denture there was appear as strawberry red spots usually these areas include canine eminence , lateral to tuberosities and retro mylohyoid undercuts .
- Adjusted gross occlusal discrepancy in centric relation or excursions .
- Re evaluated the denture for retention , place a tissue conditioner if retention in unsatisfactory .
- Advised the subject should wear the denture for three days in the night also .

Prior to 7 days suture removal was done and verify the occlusion , with pressure indicating paste Tissue surface evaluated for any soreness or irritation was there , it got relieve .

- 3 to 4 weeks later : After 3 weeks clinical remount was performed and refinement of occlusion is performed .

After 6 months If the patient meets with expectation then the denture is relined otherwise fabricate new denture ².

Figures

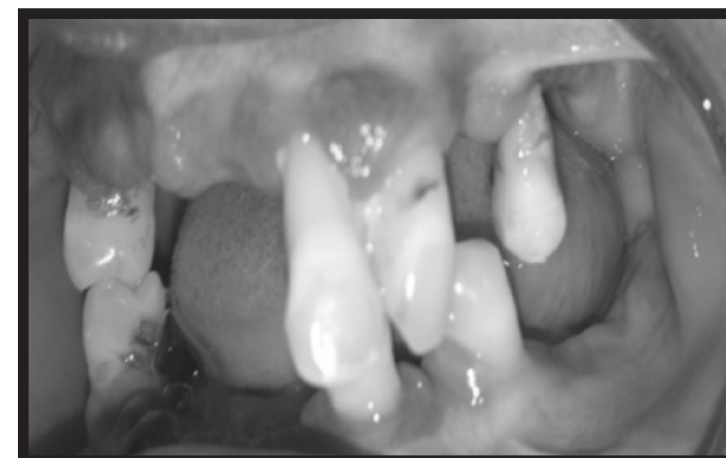


Figure 1 Several Missing Teeth With Bilateral Vertical Stop

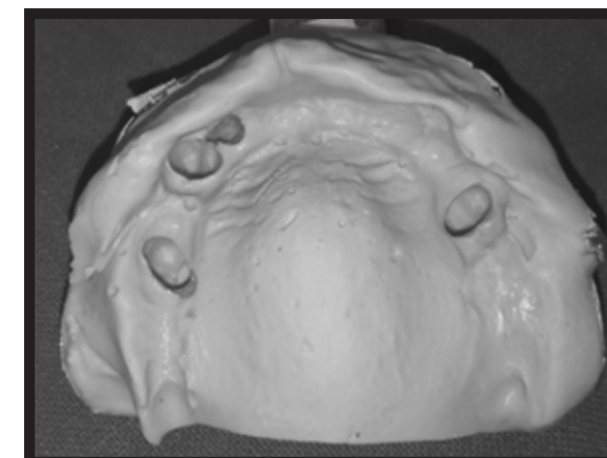


Figure 2: Maxillary Diagnostic Impression

Discussion

In spite of limitation of prosthesis , final result is quite positive specially for the patient who feel the trouble without teeth in social life ³.

One disadvantage of this prosthesis is unable to analysed aesthetics and phonetics for inserting of it as anterior teeth are in order to the patient's natural tooth. Sometimes these anterior teeth are not always as much as with athletics and it may not reasonable the patient appearance Careful evaluation of the maxillomandibular relation and arrangement of the teeth are essential factors for the necessary success of the treatment ².

Another limitation of removable prosthesis is that the lab assistant can not accommodate the teeth correctly and aesthetically because of lack of inter arch distance . Resorption takes place after several month ².

These prosthesis requires more appointments for correction , these several visit can stressful for patient as well as for dentist so at the starting of procedure choose the patient who understand the condition from psychological point of view ².

Conclusion

Immediate denture service is one of the exceptional line of treatment that dentistry to attempt the patients .

It achieves today ' s scenario for whom concern more adaptive functions and produce harmony during the healing phase. Method of treatment for those who want to become social without fear of edentulous but proper care and investigation is require for successful treatment .



Figure 3: Mandibular Diagnostic Impression

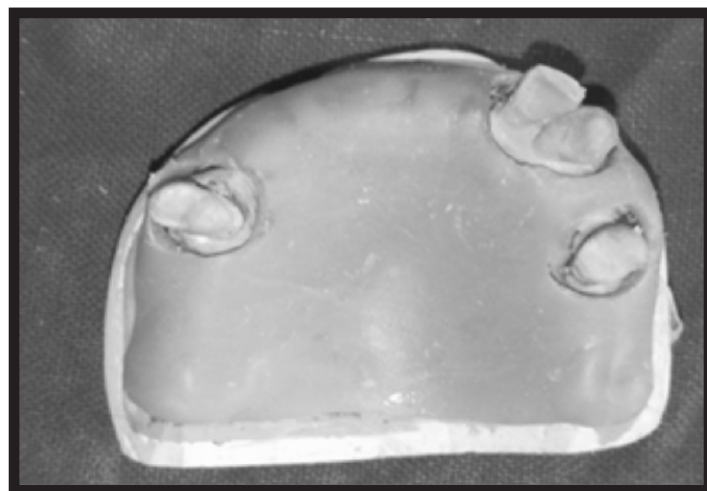


Figure 4: Custom Tray Of Maxillary Arch Using Campagna Impression

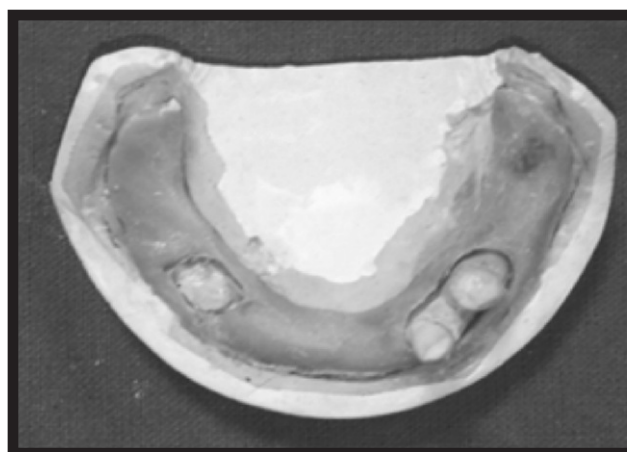


Figure 5: Final Impression of Maxillary Arch

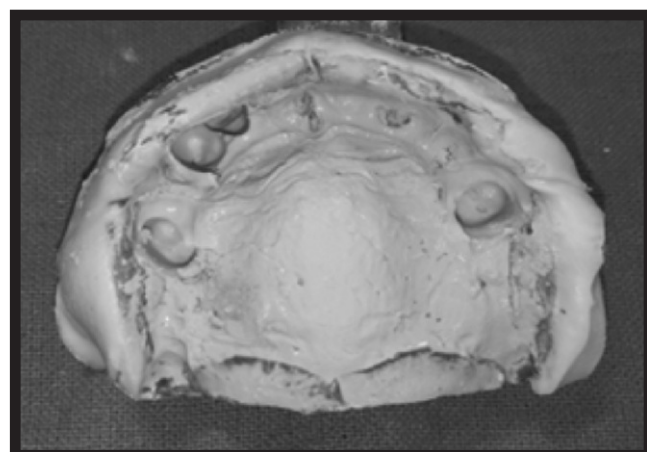


Figure 6: Final Impression of Mandibular Arch

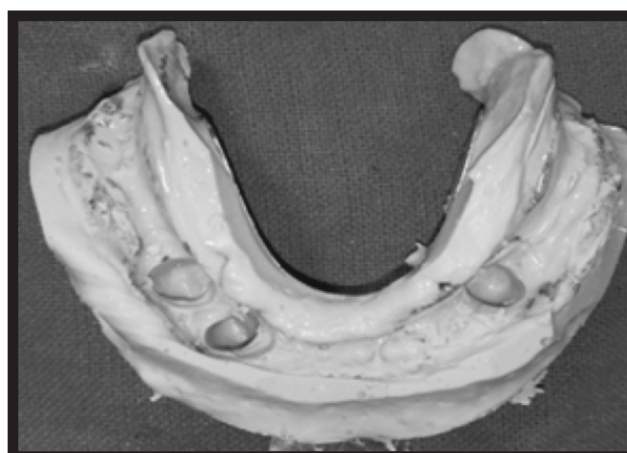


Figure 7: Maxillo-mandibular Relation

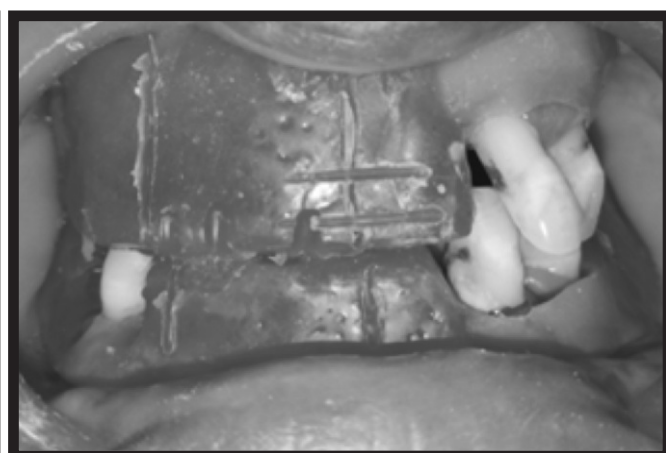


Figure 8: Gingival, Middle And Vestibular Line right lateral view

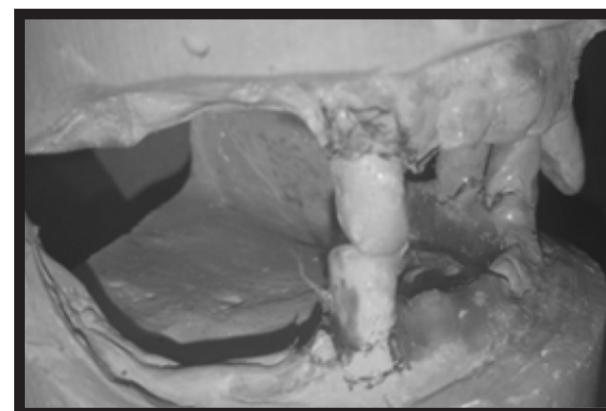


Figure 8: Gingival, Middle And Vestibular Line right lateral view

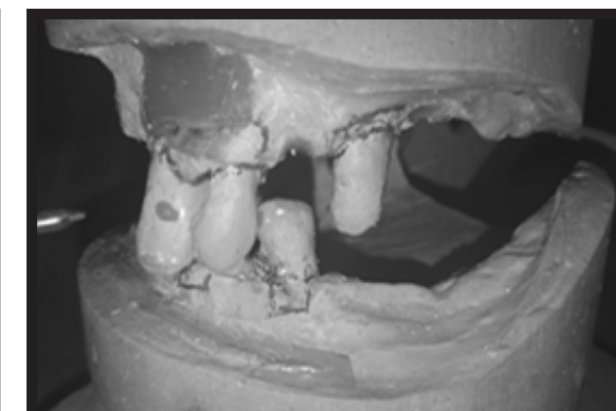


Figure 9: Gingival, Middle And Vestibular Line right lateral view

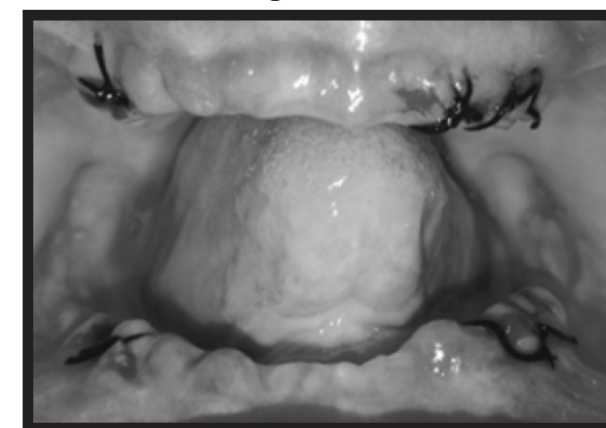


Figure 10: Extraction Performed and Suture Placed

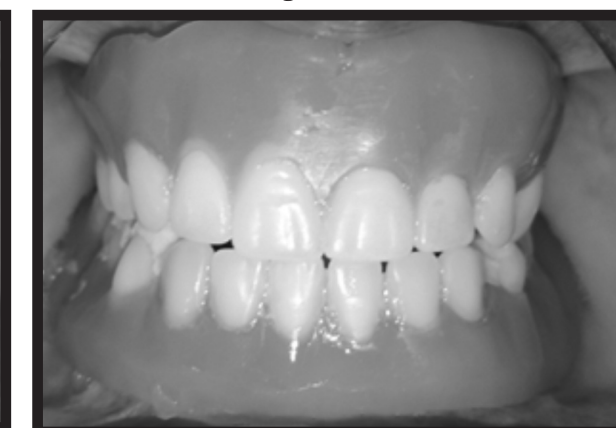


Figure 11: Denture Placement Immediate After Extraction

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