CASE REPORT

ORTHODONTIC MANAGEMENT OF CONGENITALLY MISSING MAXILLARY LATERAL INCISORS: A MULTIDISCIPLINARY TREATMENT APPROACH

Dr. Arkaprava Saha*, Dr. Subhra Mandal**
Dr. Rupam Kumari***, Dr. Manoj Singh****

ABSTRACT

Missing maxillary lateral incisors create an esthetic problem with specific orthodontic and prosthetic considerations. Because of congenitally missing lateral incisors, alveolar bone are not developed in this place. For choices of implants for prosthesis of missing lateral incisors depend upon how much cortical or quality bone present in between central incisors and canine for proper stability of implant prosthesis.For this reasons basal implant or bi-cortical dental implants are now choice of implant for prosthesis of congenitally missing lateral incisors. Nowadays the successful rehabilitation of these cases involves the adequate installation of dental implants with suitable prosthetic contour, color, and emergence profile closer to that found in natural dentition.

Several treatment options are available for restoring patients with congenitally missing teeth such as maxillary lateral incisors. Fixed prosthodontics and orthodontics managements are considered acceptable treatment protocols.

However, the gold standard rehabilitation of congenitally missing maxillary incisors is performed with implant-based prosthesis since no tooth wear neither extensive tooth movements are necessary.

This is a 25 year old female patients case report, who reported to the department with chief complain of spacing in upper anterior region. this report involves orthodontic and prosthodontic approach in which pre-treatment,mid-treatment & post-treatment records of the patients are presented.

KEY WORDS

Anodontia / Therapy, Dental Implants, Orthodontics /Corrective

ABOUT THE AUTHORS

* MDS (Orthodontics), **Post Graduation Trainee 3rd year
***Associate Professor
Department of Orthodontics and Dentofacial Orthopaedics
Guru Nanak Institution of Dental Sciences and Research
****Ex Reader, Department of Periodontics
Guru Nanak Institution of Dental Sciences and Research, Kolkata

CORRESPONDING AUTHOR

Dr. Arkaprava Saha
Consultant Orthodontist
drarkaprava.saha@gmail.com, Tel 8918182117

INTRODUCTION

Present-day demands and expectations of esthetic dentistry are growing. To provide esthetic anterior tooth shape and correct agenesis, patients must be informed of their total dental needs, not just those associated with a limited specialty.

To integrate and coordinate treatment, patients need to be offered a total treatment approach. that maximizes function, esthetics, and oral health. In many routine dental malocclusions, just orthodontic treatment alone may not be enough. We must evaluate the patient's facial profile, smile line, buccal corridor, black triangles, lip line, and crowding. One sided approach to multifaceted problems often produce compromised results.

Agenesis of one or more teeth constitutes one of the most common developmental anomalies in man.[1]

Familial tooth agenesis is transmitted as an autosomal dominant, recessive or X-linked condition.[2]

The reported incidence of permanent tooth agenesis varies from 1.6 to 9.6%, excluding third molars, which occurs in 20% of the population.[3]

Studies vary on what the second most commonly missing teeth are. Some studies[4-8] have shown that they are the maxillary lateral incisors, whereas others[9-12] indicate there is a higher incidence of mandibular second premolar agenesis. Muller and colleagues 5 found an interesting correlation that maxillary lateral incisors are the most frequently missing teeth when only one or two teeth are absent, whereas second premolars are the most frequently missing teeth when more than two teeth are absent.

Maxillary lateral incisors show the highest genetic component of variability in the general population, whereas the smallest genetic influence on size of an anterior tooth is seen in the canine.

Numerous twin studies[13–15] illustrate hereditary factors in the mesio-distal dimensions of the teeth, and populations with chromosomal aberrations, such as those that occur in Down's syndrome, display a generalized reduction in tooth size and number.[16] Tooth agenesis is more frequent in the parents and siblings of individuals with missing teeth than in the population as a whole, a finding that

supports the hypothesis that this condition is genetically determined.[17,18]

The management of missing lateral incisor requires an integrated multidisciplinary approach[1]. Generally the choice between space opening with tooth replacement and space closure with canine substitution relies on several parameters to be considered before treatment planning.

Commonly the choice is related to occlusal relationship (i.e., overjet and overbite, molar relationship), facial typology and profile, arch length, and tooth size discrepancies. The morphology of the canine, in terms of size and shape, and its colour[2] also may address different treatment strategies. Finally, patient expectation and compliance can influence the treatment planning.

In case of unilateral tooth agenesis, space opening is often recommended to improve the aesthetics of patients and preserve smile symmetry. On the contrary, in case of bilateral agenesis, space closure and space opening could be both performed with respect to the issues previously reported[3-6].

Space opening is advised in low-angle subjects, whilst in high-angle individuals space closure should be preferred to preserve arch anchorage and avoid clock-wise rotation of the lower jaw. Retruded profiles should be better treated with space opening and tooth substitution, in order to improve labial sagittal relationships. This treatment strategy should be avoided in subjects with bimaxillary dental protrusion, in which it could result in worsening of the profile.

Molar relationship should be also considered. Molar class I or class III tendency should be better treated with space opening to preserve ideal occlusal anterior and posterior relationship (i.e., canine and molar relationship) and establish a solid angle class I. In case of full cusp or partial molar class II, space closure should be preferred to facilitate orthodontic biomechanics and reduce treatment duration. A stable molar class II and canine class I are then obtained. However, in case of arch length discrepancies extractions in the lower arch should be considered, thus obtaining a molar and canine class I.

Anterior relationship, that is, overjet and overbite, must be taken into account in terms of facilitation of biomechanics. Reduced overjet and increased overbite may easily be improved by space opening mechanics, whilst increased overjet and reduced overbite may benefit from space closure.

Shape and size of canines affect the possible rehabilitation choice. Differently from cases with large canines, in which space opening is advocated, small canines can be easily transformed in lateral incisors by using porcelain veneers or composite materials. The original position of the canine should be considered. Teeth closer to the midline are best candidate for incisor substitution.

Dental agenesis is the absence or failure on teeth formation. Absence of permanent maxillary lateral incisors represents approximately 20% of all cases of dental agenesis, and this anomaly is more common to occur unilaterally (GALLER, et al. 2009). Restorative dentists and orthodontists have many treatment plan options when restoring partially edentulous patients. However, the use of endosseous dental implants has become the treatment of choice for restoring patients with congenitally missing teeth. Dental implant therapy can restore such patients with acceptable esthetic and functional outcomes as well as enhanced clinical prognosis and patient satisfaction (ADELL, et al. 1981). Missing maxillary lateral incisors create an esthetic problem with specific orthodontic and prosthetic considerations. Dental implants are commonly used to replace congenitally missing lateral incisors in young orthodontic patients (DE AVILA, et al. 2012).

However, an interdisciplinary approach should be observed during the diagnosis, prognosis and treatment plan to provide a result with good predictability, reaching the esthetic and functional expectations of the patient (ZARONE, F. et al. 2006). If a patient presents congenitally missing maxillary lateral incisor, the width of the space for the implant and crown is determined by opposite lateral incisor. However, in other situations, when both lateral incisors are congenitally absent, the amount of space for the implant and crown is determined by crowding, profile, crown shape and color, smiling lip level and occlusion (ZARONE, etal. 2006, KOKICH, 2004). The orthodontic phase must achieve several clinical criteria before the initiation of the implant surgical stage (SPEAR, et al, 1997). The occlusion must ensure a stable posterior intercuspation with an ideal overjet and overbite. The anterior edentulous area needs to allow sufficient space between an implant and the adjacent tooth, thereby allowing for stable crestal bone levels and ideal dental papilla formation (ESPOSITO, et al.1993).

The decision to keep spaces from missing lateral incisors or to close them orthodontically should be evaluated carefully after consideration of both the treatment plan and the biomechanics (SABRI, 1999, BAIDAS; HASHIM 2005). In addition, the Golden Proportion parameters allows for the establishment of the ideal width proportion of the maxillary lateral incisor to its adjacent central incisor (LOMBARDI, 1973). Further, anterior maxillary aesthetics can be improved by minimally invasive aesthetic procedures such as ceramic laminates supplementing the outcomes of orthodontic and implant treatments.

Since missing lateral incisors are not rare in population and the multidisciplinary planning is fundamental on treatment success, the aim of the present paper was to report a case of maxillary lateral incisor bilateral agenesis in a young patient in which the multidisciplinary treatment allowed suitable resolution with excellent reestablishment of function and aesthetics.

Fig. 1: Pretreatment extraoral views

Fig. 2: Pretreatment intraoral views

Fig.3: Orthopantomogram

CASE REPORT

A 25-year-old female patient complains of spacing in the upper anterior region.

EXTRAORAL EXAMINATION:

Extraoral examination reveals a mesomorphic facial form, orthognathic facial profile with competent lips and acute nasolabial angle (Fig. 1).

INTRAORAL EXAMINATION:

Angle's class I molar relation on both sides and class II canine relation on both side with overbite of 2 mm and overjet of 2 mm. Bilateral rotated first maxillary premolar present. Spacing in the maxillary anterior region due to the absence of upper lateral incisors, (Fig. 2)

DIAGNOSIS

A case of skeletal class I, average growth pattern with Angles class I molar relation on both sides and end on canine relation on both side, overbite of 2 mm and overjet of 2 mm, spacing in the maxillary anterior region, congenitally missing upper lateral incisors.

RADIOGRAPHIC EXAMINATION

Panoramic radiograph examination shows congenitally missing maxillary lateral incisors bilaterally (Fig. 3). Cephalometric findings revels orthognathic maxilla and mandible with mild proclined upper and lower incisors.

TREATMENT OBJECTIVES

- To open up the spaces for the missing lateral incisor
- To achieve class I canine relation.

Fig.4: Lateral cephalogram & Analysis

SKELETAL ANALYSIS I

PARAMETERS	NORM	PT.VALUE	INFERENCE
MAXILLA			
SNA	81.1± 3.8°	81	Maxillary orthogenetic
N Pr. To A(mm)	-2.3± 3	0	
Eff. M. Length(mm)	86 ± 2.3	84	
MANDIBLE			
SNB	79.3±3.9°	78	Mandibular orthogenetic
N Pr. To Pog (mm)	-6.7±5.1	-6	
Eff. Mn Length (mm)	113.4±4.7	110	
MX-MN			
Wits AO/BO (mm)	0 to -1	1	Class I skeletal base
ANB	3.8±2.2°	3	
Angle of convexity	8.5 to 10°	4	
Mx – Mn diff (mm)	21.1 ±2.7	26	

SKELETAL ANALYSIS II

PARAMETERS	NORM	PT.VALUE	INFERENCE
VERTICAL			
FMA	24.2±3°	20	Horizontal growth pattern
SN Go Gn	32°	24	
Y –Axis	53 to 66°	59	
Jarabaks ratio(%)	62 to 65%	70	
LAFH	60.1±4.6mm	61	
Saddle angle	123± 5°	128	
Articular angle	143±6°	145	
Gonial angle (U)	128±7°	120	
(L)	52 to 55°	56	
	70 to 75°	68	

PARAMETERS	PT. VALUE	INFERENCE
Naso-labial angle	90°	nasolabial angle with in normal value
L lip to E-line(mm)	-2	
L .lip to S-line(mm)	1	
U .lip to E-line(mm)	-2	

PARAMETERS	NORM	PT. VALUE	INFERANCE
MAX. INCISORS			
U. Incisors to NA (deg/ mm)	22/4°	20/2	Incisor position mild linguoversion
U . Incisor to A vert. (mm)	3.3±1	-5mm	
U. Incisor to A pog (mmm	-1 to 5	+7mm	
U. Incisor to FH	107		
U . Incisor to SN	102°	97	
MAN. INCISORS			
L incisors to NB (deg/mm)	25°/4	27/4	Incisor position mild labioversion
L incisor to Mn. Plane	90	93	
L incisors to Occ.plane	14.5	20	
L incisors to A-pog (mm)	1.6 sd 2.3	7	
MX—MN			With in normal limit
Inteincisal Angle	135°	133°	
Overjet (mm)	2mm	1mm	
VERTICAL PLANE			
Overbite (mm)	2mm	2mm	

• To replace the missing lateral incisors with implant prosthesis.

• To maintain the class I molar relation on both sides.

TREATMENT PLAN

Treatment plan is divided in to two phases:

A. Orthodontic phase

B. Prosthodontic phase.

ORTHODONTIC PHASE

Aim of the orthodontic phase is to open the space by distalizingthe canines. The option of space closure by mesializing canine was not preferred due to class I molar relation well inter digitated posterior occlusion, and also for recontouring of canine to lateral incisor the morphology of canine with sharp cusp, need for intentional root canal treatment of a sound natural teeth.

Treatment Progression Orthodontic treatment started with 0.022" MBT preadjusted edgewise

appliance. The sequence of archwires started initial with 0.016" NiTi archwire followed by 0.018"SS, 16× 22"SS, 17 × 25"SS and 19 × 25"SS archwires. In 19 ×25"SS archwire canine was retracted on both sides by beneath method of retraction. Sufficient space was gained for replacement of lateral incisors by distalizing the canine to class I relation and also closing the mid-line space (Figs 4). Treatment period lasted for 12 months.

After retraction radiographs were taken to assess the bone level and root parallelism for the implant placement. After final finishing and detailing of the occlusion the fixed appliance were debonded and upper Hawley's retention appliance were given.

PROSTHODONTIC PHASE

The prosthodontic phase includes the following:

Implant Selection and Template Fabrication:

Template was fabricated for guiding implant placement during surgical procedures. Based on bone density, height and width implant was selected.

SURGICAL STAGE:

First stage surgery:

In the first surgical stage, utilizing a surgical template prepared from a wax-up of the proposed implant-supported restoration, a 3.5 to 11 mm Biconuncoated implant fixture was placed under local anesthesia.

Second surgical phase:

The second surgical phase involved placement of the abutment and fabrication of a temporary crown. Under local anesthesia, a Bicon 4.0 to 6.5 mm angled abutment was installed and a temporary crown was placed.

The Bicon abutment utilizes a locking taper for retention of the abutment to the implant fixture. The locking taper allows any sized abutment to fit onto any sized implant, improving prosthetic versatility.

Fig.7 Pilot drilling & final drilling with physiological handpiece

Fig.8 Intraoral periapical view before implant placement

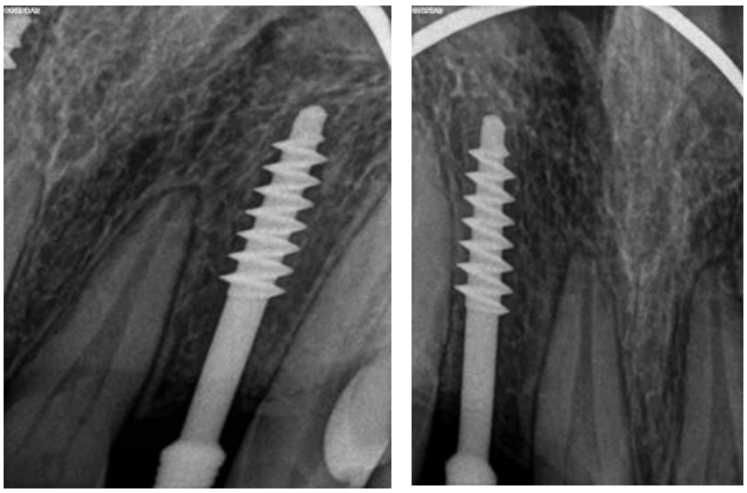


Fig.9 : Intraoral periapical view after implant placement

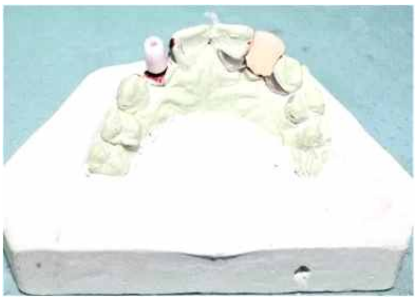
Fig.10 : Implant placement

The abutment was prepped to provide ideal alignment and emergence profile of the crown. The tissue sallowed to mature for 6 weeks, and the patient returned for the impression appointment.

Impression Making

After the fixture was placed, impression copings were placed and an open tray impression technique was used to transfer the exact position of implants to the cast (Fig11)

Fig.11 Impression



Prosthesis Fabrication

The completed prosthesis was given with all ceramic crowns for upper right and left lateral incisors and was cemented with resin cement.

Post-treatment

The post-treatment result shows an improved smile with better facial esthetic. The post-treatment radiographs show the implants replacing the maxillary incisors.

TREATMENT RESULT:Parameters		Standard values	Pre-treatment	Post-treatmer
Sagittal skeletal relationship	SNA (°)	82	81	82
	SNB (°)	80	78	80
	ANB (°)	2	3	2
	Wits appraisal (mm)	1	-1	0
Dental base relationship	Upper incisor to NA (mm/°)	4mm/22	2/20	4mm/28
	Lower incisor to NB (mm/°)	4/25	4mm/27	5mm/29
	Upper incisor to SN plane (°)	102±2	97	113
	Lower incisor to mandibular plane angle (°)	90±3	93	96
Dental relationship	Inter-incisal angle	131	130	120
Vertical skeletal relationship	SN plane-Mand. plane (°)	32	24	25
	Facial height index (%)	65	61	63
Soft tissues	Upper lip thickness mm	15	13	14

FIG. POST TREATMENT INTRA-ORAL & EXTRA-ORAL VIEW

Fig. Pretreatment smile

Fig. Post treatment smile

DISCUSSION

Missing lateral incisor leads to an obvious asymmetry in the patients smile, shift in the dental midline. The use of dental implants in the esthetic zone is well-documented in the literature, and numerous controlled clinical trials show that the respective overall implant survival and success rates are similar to those reported for other segments of the jaws. When maxillary lateral incisors are congenitally missing, permanent canines frequently erupt mesial to their normal positions. After the canine has erupted, it can be moved distally into its normal position by orthodontic treatment.

By moving the tooth distally, bone is laid down, forming an alveolar ridge with adequate buccolingual width to allow proper implant placement. Since implants are most suitable as a restorative option for adults after facial growth is complete, the need to maintain alveolar bone for several years until growth has ceased presents another challenge.[19,20]

When planning for the placement of a single-tooth implant, the orthodontist must ensure adequate space between the crowns and roots. Both the quantity and quality of alveolar bone must be assessed before implant placement is considered.[21]

To accommodate a standard implant there should be a minimum of 10 mm of inciso-gingival bone and a minimum of 6.0 mm of facial-lingual bone.[22]

In cases where there is insufficient alveolar bone for implant placement, ridge augmentation may be necessary in addition to orthodontic repositioning of adjacent teeth.[21]

Adequate space for the implant is also required between the adjacent roots.[23,24] The average dental implant fixture is 3.75 mm wide, and 1 to 2 mm of space is necessary between the fixture and the adjacent roots.[25] Typically, between 6 and 8mm of bone between the central and canine roots is recommended. Creating adequate space between the roots must be specifically addressed since the central and canine roots may be brought into closer proximity when the teeth are initially aligned orthodontically.[22]

To create adequate space for the implant,further orthodontic treatment may be necessary to move the roots further apart. Space for the coronal restoration must also be assessed. The average implant platform, which is 4.0 mm wide, requires a space of 1.0 mm mesially and distally between the platform and the adjacent tooth to facilitate proper healing and the development of a papilla postoperatively.[24,25] Thus, a minimum of 6 mm of space for the lateral crown is required.[23,24]

Single tooth implants are a good treatment option for replacing the missing teeth provided that the subject's dental and skeletal development is complete and it has several improvements over resin-bonded prosthesis:

Preparation of adjacent teeth is not needed; the tooth replacement will function individually; a conventional oral hygiene technique can be used; preservation and stimulation of existing bone and soft tissues occur, including recreation of the interproximal papillae; and stability and function are improved because of the implant supporting the crown.

As discussed above, one goal of orthodontic alignment is to achieve sufficient bone between the roots to place the implant. The roots of the central incisor and canine should be parallel to slightly divergent to avoid complications resulting from root proximity.

Usually, the tip of the central incisor is approximately 5° while that of the canine is 13°,which means that the roots are slightly divergent. There are additional mechanotherapy treatment options that can be used to orthodontically position the roots of the adjacent teeth and create adequate space for the implant. These include ideal placement of brackets to achieve the correct root and crown positions; bending the archwire to accentuate root divergence; or bonding a contralateral bracket on a central incisor (such as placing the maxillary right central incisor bracket on the maxillary left central incisor) to accentuate root divergence in the implant area.[27]

The esthetic advantage of a single tooth implant vs a three unit bridge is, A pontic for a three unit bridge simply sits on top of the soft tissue, whereas a single tooth implant restoration emerges from the soft tissue. Maintenance of oral hygiene is not a major issue when a single tooth dental implant is placed as the patient can easily floss in the conventional fashion as with a natural tooth.

Advantages of single tooth implant include improved esthetics, improved hygiene accessibility, osseous preservation, and reduced future maintenance all at a comparable cost. The most important advantage of using implants to replacemissing lateral incisors is that they leave proximal teeth untouched.

Implants have become the restoration of choice for most patients when the treatment option is to open space. For implant treatment to be successful there must be an adequate intercoronal and interradicular space opening and root paralleling of the adjacent teeth, including the apical areas, and the abutment teeth must be completely stabilized.[19]

Placement of a dental implant is the most conservative approach from a biological standpoint as placing a dental implant in bone provides a functional stimulus to help preserve the remaining bone and prevent resorption while preserving the sound structures of the adjacent teeth.

CONCLUSION

Congenitally missing lateral incisors presents a challenging treatment dilemma for the clinician as they are usually associated with other malocclusions and abnormalities. For a successful outcome and patients satisfaction a coordinated orthodontic, prosthodontic, periodontal and restorative treatment approach, with careful concern toward patient expectations and requests are critical. For the replacement of congenitally missing upper lateral incisors single tooth implants should represent the treatment of choice. An implant will preserve tooth structure and alveolar bone and provide esthetics and function. As mentioned above successful restorative treatment involving implants depends on interdisciplinary treatment planning, especially if preprosthetic orthodontic tooth alignment is required. The roots of the teeth adjacent to the edentulous implant region must be parallel or slightly divergent to create sufficient bone for implant placement, and there must be sufficient space between the crowns to place an implant and restore.

REFERENCES

1. Shapiro SD, Farrington FH. A potpourri of syndromes with anomalies of dentition. In: Jorgenson RJ, editor. Dentition genetic effects. birth defects: original article series. New York: March of Dimes Birth Defects Foundation; 1983, pp. 129–40.

2. Burzynski NJ, Escobar VH. Classification and genetics of numeric anomalies of dentition. Birth Defects 1983;19:95– 106.

3. Graber LW. Congenital absence of teeth: a review with emphasis on inheritance pattern. J Am Dent Assoc 1978;96:266– 75.

4. Brekhus P, Oliver C, Montelius G. A study of the pattern and combination of congenitally missing teeth in man. J DentRes 1944;23:117–31.

5. Muller TP, Hill IN, Peterson AC, Blayney JR. A survey of congenitally missing permanent teeth. J Am Dent Assoc 1970;81:101–7.

6. Baum BJ, Cohen MM. Studies on agenesis in the permanent dentition. Am J Phys Anthropol 1971;35:125–8.11. Balshi TJ. Osseointegration and orthodontics: Modern treatment for congenitally missing teeth. Int J Periodontics Restorative Dent 1993;13(6):495.

7. Wojtowicz N, Kondrat-Wodzicka H. Congenital absence of teeth and malocclusions. CzasStomatol 1972;25:969–77.

8. Malik SA. Missing and rudimentary upper lateral incisors: a statistical survey. J Dent 1972;1:25–7.

9. Grahnen H. Hypodontia in the permanent dentition: a clinical and genetical investigation. Odont Revy 1956;7:1–100.

10. Glenn FB. Incidence of congenitally missing permanent teeth in a private pedodontic practice. ASDC J Dent Child 1961;28:317–20.

11. Serrano J. Oligodontia and fusion. Oral Surg Oral Med Oral Pathol 1972;34:691–2

12. Hundstadbraten K. Hypodontia in the permanent dentition. ASDC J Dent Child 1973;40:31–3.

13. Osborne RH, Horowitz SL, De George FV. Genetic variation in tooth dimensions: a twin study of the permanent anterior teeth. Am J Hum Genet 1958;10:350–6.

14. Ludwig FJ. The mandibular second premolars: morphologic variation and inheritance. J Dent Res 1957;36:263–73.

15. Lundstrom A. Tooth morphology as a basis for distinguishing monozygotic twins. Am J Hum Genet 1963;15:34–43.

16. Arvystas MG, Cohen MM. Mesiodistal crown diameters of the permanent teeth in Down's syndrome. Am J Ment Defic 1970;74:563–7.

17. Goose DH. Preliminary study of tooth size in families. J Dent Res 1967;46:959– 62.

18. Lewis DW, Grainger RM. Sex-linked inheritance of tooth size. a family study. Arch Oral Biol 1967;12:539–44. Semin Orthod 1997;3(1):3-20.

19. Kokich VG, Spear FM. Guidelines for managing the orthodonticrestorative patient. Semin Orthod 1997;3(1):3-20.

20. Spear FM, Mathews DM, Kokich VG. Interdisciplinary management of single-tooth implants. Semin Orthod 1997;3(1):45-72.

21. Aktas G, Canay S, Aktas A, El H, Bayramo I. Interdisciplinary approach for congenitally missing maxillary lateral incisors. Int J Dent Sci 2010;8(2):226-29. 22.Park JH, Kim DA, Tai K. Congenitallymissing maxillary lateral incisors: Treatment. Dent Today 2011 May;30(5):81-82, 84-86; quiz 87.

23. Tuna H, Uzun G, Keyf F. The single-tooth implant treatment for maxillary central incisors loss after trauma: Case reports. Clin Dent Res 2011;35(1):47-52. 24.Hess D, Buser D, Dietschi D, Grossen G, Schonenberger A,Belzer UC.Esthetic single-tooth replacement with implants: A team approach. Quintessence Int 1998;29(2):77-86.

25. Phillips K, Kois J. Aesthetic peri-implant site development. The restorative connection. Dent Clin North Am 1998;42(1):57-70.

26. Balshi TJ. Osseointegration and orthodontics: Modern treatment for congenitally missing teeth. Int J Periodontics Restorative Dent 1993;13(6):495.

27. Orthodontic Diabogue. The role of the orthodontist on the maxillary anterior implant team. Am Assoc Orthodod 1998;10(2) (www.aaojufo.org; accessed on 12/09/2013).AD

