

Replacement of Congenitally Missing Maxillary Lateral Incisor with Ipsilateral Canine: A Case Report

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Abstract

Congenital missing lateral incisor of maxilla is a common tooth anomaly. Its replacement can have many options. The choice ought to be understandable for patients or guardians hence effectively address the patient's issues. Regardless of canine replacement, solitary inserts, tooth-supported prosthesis are techniques for patients with missing maxillary missing lateral incisors, although numerous confronts are engaged with acquiring and holding ideal outcomes.

In this case report, a case of 16-year-old boy is discussed who has the diagnosis of Class II division 1 with missing upper laterals and anterior open bite. Plan was to perform space closure by canine lateralization and retraction of upper anterior to reduce the overjet followed by extraction of lower 5s to alleviate anterior crowding, correct molar relationship, maintain lower anterior teeth position, finishing, and alignment followed by retention.

Keywords: Malocclusion, congenital, incisor, maxilla

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Introduction:

The art and technique of choice in treatment sketch suggests recognizable proof of elective strategies, forecast of the relative chances for the ideal long pull result for choice, and assessment of the cost-hazard advantage proportions of every other option¹.

The agenesis of the maxillary lateral incisor is very common and is usually diagnosed early. It is also one of the most common tooth anomaly reported by the patients².

Many options available since the advent of modern dentistry to permanently replace missing lateral incisors. They can range from hybrid composite build-ups to ultra-thin enamel bonded thin veneers to modern implant replacement of the tooth. The treatment of choice depends on multiple factors, especially in the anterior maxilla, where optimal aesthetic achievement is the ideal requirement³.

The ideally formulated treatment objectives are to address congenitally missing 12 and 22 by space opening and maintaining for tooth-supported restoration, or a single-tooth implant.

Other treatment objectives include space closure using canine to serve as lateral incisor and 1st premolars as canines or to address open bite by decreasing the posterior vertical projection of the maxilla and auto rotation of the mandible, to address overjet by retroclination of upper incisors, decreasing posterior vertical projection of the maxilla

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and increasing horizontal projection of the mandible, to address incompetent lips by decreasing overjet and decreasing open bite, to address midline discrepancy by differential tooth movement, to address retrognathic mandible and mild class II by increasing the horizontal projection of the mandible and differential tooth movement, to address lower anterior teeth irregularities by space creation and aligning these teeth to the ideal position and angulations, to address proclined and protruded upper anterior teeth by retroclining them to the ideal angulations and position, to address exaggerated curve of spee in maxilla by reclining relatively extrusion of upper anterior and to address narrow maxilla by relative dental maxillary expansion⁴.

This case report was reported in order to aware the orthodontists for proper evaluation, diagnosis and management of cases especially with missing maxillary lateral incisors.

Case Report:

This case was reported at the department of Orthodontics, King Khalid University, Kingdom of Saudi Arabia in 2016. The duration of treatment was 2 years. The patient's guardian had given informed consent for the publication of case report.

A 16 year 6 month old mesocephalic, caucasian male, reported with the complaint of retained primary teeth along with crooked teeth in the upper jaw. He had no relevant and significant medical history.

He had non-significant family history. The facial analysis showed an ovoid, slightly non symmetrical face with chin deviation on the left side. He has convex profile and incompetent lips. He had a normal nasolabial angle. He also has a retrusive chin. Intraoral examination revealed normal and healthy oral mucosa. The patient was in permanent dentition as revealed by dental cast with congenital absence of 12 and 22 and the 3rd molars were unerupted.

Mandibular midline was not coinciding with facial midline; it was shifted on left by 2 mm. Right

lateral examination showed canines in ½ unit Class II relationship and molars in Class I relationships. Left lateral view revealed that canines in ½ unit Class II relationship and molars in ½ unit Class II relationships. Maxillary occlusal examination revealed a relatively symmetrical V-shaped arch with anterior irregularity index of 5 mm. The upper laterals were congenitally missing. The maxillary arch-width is 32.6 mm. Mandibular occlusal inspection revealed an asymmetrical U-shaped arch with crowding of 9 mm. The curve of spee is exaggerated in the maxilla. (Fig 1).

The patient was advised for orthopantomogram (OPG), posteroanterior skull (PA), and lateral cephalometric radiographs. (Fig 2,3,4). The OPG revealed that 30 teeth are present including developing third molars with congenital absence of 12 and 22. The PA skull film revealed that the upper and lower dental midlines are not coincident. Mandibular midline did not coincide with facial midline and it was deviated to left by approximately 2 mm. Cephalometric examination illustrates a hyperdivergent CLII skeletal pattern. It is distinguished as the retrognathic mandible and proclined and protruded upper anterior teeth. In the light of history, examination, and investigations (cast analysis, OPG, PA, and Cephalometric analysis) the diagnosis of CLII Div 1 with missing upper laterals and anterior open bite was made.

The patient was counselled for two treatment options orthognathic surgery and orthodontic treatment: Orthognathic surgery would allow us to achieve the treatment aims with skeletal discrepancy correction, FF A's, address missing upper laterals by space opening, and refer the patient for subsequent treatment such as tooth-supported restoration, or a single-tooth implant with extraction of upper 4's. space closure by canine lateralization, surgical impaction of the maxilla, extraction of lower 4's and advancement and autorotation of the mandible, retention.

The treatment plan was fixed as orthodontic treatment with extraction and canine substitution, space closure by canine lateralization and retraction



Fig 1. Showing pre-treatment orthodontic extraoral and intraoral clinical pictures.



Fig 3. Showing pre-treatment lateral cephalogram

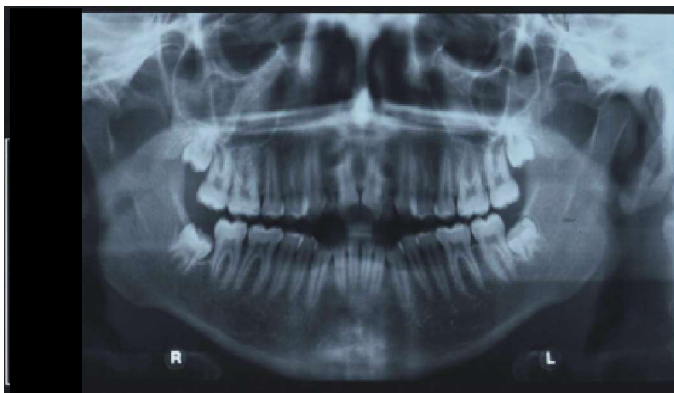


Fig 2. Showing pre-treatment. orthopantomogram (OPG)

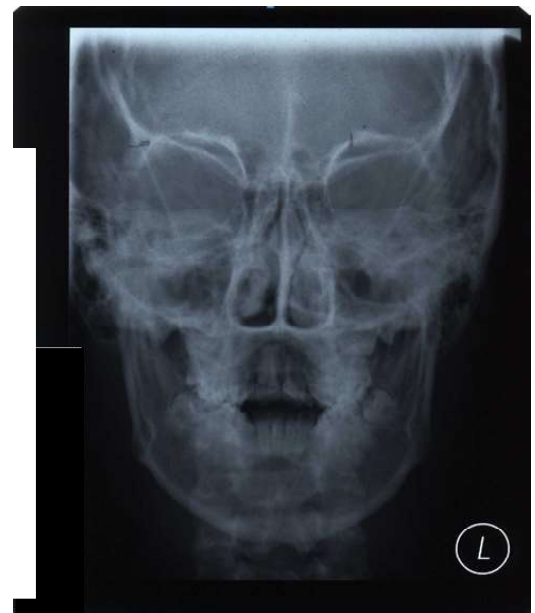


Fig 4. Showing pre-treatment posterior-anterior view.

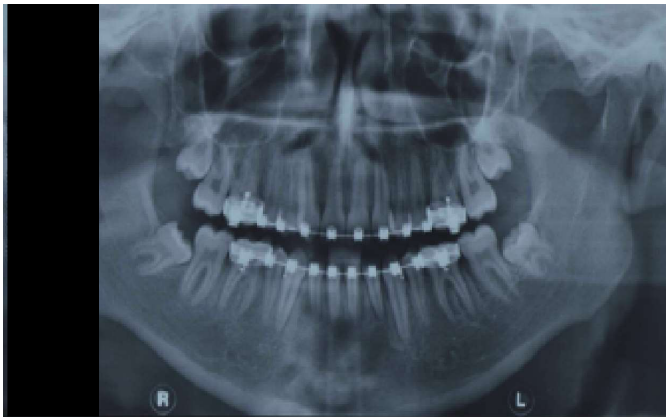


Fig 5. Showing intratreatment orthopentomogram.



Fig 7. Showing post treatment orthodontic extraoral and intraoral clinical pictures

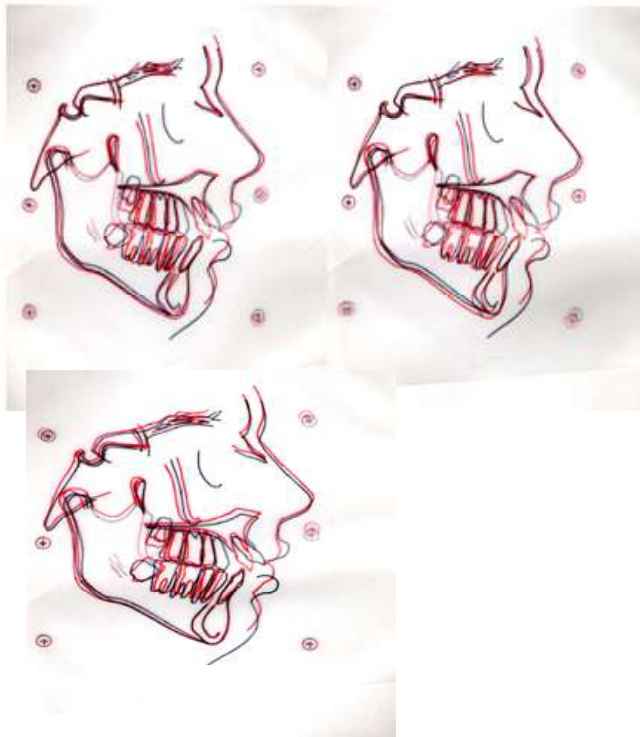


Fig 6. Showing cranial, maxilla and mandibular superimposition of lateral cephalometric.



Fig 8. Showing post treatment orthopentomogram.



Fig 9. Showing posttreatment lateral cephalogram.

of upper anterior to reduce the overjet, extraction of lower 5s to alleviate anterior crowding, correct molar relationship and maintain lower anterior position and fixed functional appliances or FFA's. Retention was achieved by positioner followed by upper 3-3 fixed by Hawley's retainer and lower 3-3 fixed by Hawley's retainer.

Therapeutically modifiable treatment objectives were formulated after considering the patient's age and choice. Orthodontic treatment with extraction and canine substitution, space closure by canine lateralization and retraction of upper anterior to reduce the overjet, extraction of lower 5s to alleviate anterior crowding, correct molar relationship and maintain lower anterior position, FFA's and retention was achieved by Positioner followed by upper: 3-3 fixed and Hawley's retainer, lower: 3-3 fixed and Hawley's.

After thorough reassurance and counselling, taking written consent and discussion of all possible treatment complications and problems the treatment was started with the Extraction of upper

primary laterals and lower 5's. After healing and radiographic evidence of bone formation banding of maxillary and mandibular first molars was done bilaterally. We started with the self-ligation bracket system. In the first stage of treatment, alignment and levelling, we used 014 Nickel titanium (NiTi) progressing to 17x25 NiTi archwire in the upper arch and 014 NiTi archwire progressing to 17x25 NiTi in the lower arch. In the second stage, arch coordination and space, the closure was achieved through upper 19x25 stainless steel (SS) archwire, followed by 19x25 SS in the mandibular arch along with minimal CLII elastics. In the third stage, finishing and detailing was achieved through upper 016/018 SS and lower: 016/018 SS. The retention was achieved through positioner followed by upper: 3-3 fixed by Hawley's retainer and lower: 3-3 fixed by Hawley's retainer. The patient was referred to the oral surgery department to remove all 3rd molars Fig 5.

The total duration of treatment until the final insertion of the retainer was 2 years and 5 months approximately. Patient satisfaction was achieved with a favorable outcome and his facial aesthetics. (Fig 6,7,8,9) He was advised to come for follow-ups for any further consultation.

Discussion

The significant focal points of orthodontic space closure for young patients with upper incisor agenesis and a coinciding disturbance in occlusion are the perpetual quality of completed outcome and the probability to complete treatment in near the beginning of adolescence⁵. In the presented case, objective of treatment was to address; congenitally missing 12 and 22 with retained primary upper laterals, anterior open bite due to vertical maxillary excess, increased overjet, incompetent lips, midline discrepancy, mild retrognathic mandible with retrusive chin, mild CL II (left side), lower anterior teeth irregularities, proclined and protruded maxillary incisors, the exaggerated curve of spee upper arch and mild narrow maxillary arch. The major benefit of this approach is that the alveolar bone stature in the actual region was kept up by early mesial growth of

canine and so there was a requirement for removable or fixed retainers until inserts were set in order to prevent versatile modifications that would have occurred⁶.

The reopening of the gap among the front teeth for the youthful patients is an impediment to the cure of choice. However, the inclination after cure may be overwhelmed along with long haul fixed maintenance with a lingual retainer, legitimate reclamations of the focal incisors and first premolars adjoining the substituted canines, bolstered by an even useful impediment with changed gathering capacity on the working side. The ultimate result ought to be enhanced with a removable plate to be utilized ceaselessly for a half year and afterward around evening time⁷.

A group approach of amalgamation if done meticulously during orthodontic space closure and porcelain veneer on few teeth will make it conceivable to treat patients with agenesis of maxillary lateral incisor to an outcome that gives the appearance of an unblemished regular dentition. Favourable circumstances of such methodology are; Child patients will get the conclusive outcome as of now as youthful youngsters, the general treatment can be finished after the orthodontic intercession, and long haul adjustments of the teeth and supporting structures will seem normal^{8,9}.

Conclusion

Thorough history and clinical examination followed by appropriate investigations and their interpretation leads the clinicians towards comprehensive treatment planning and are the keys of success for favourable, optimal and intended outcome of treatment.

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