

## Esthetic Provisional Restoration after Implant Placement in Patients with Bilateral Congenital Missing Maxillary Lateral Incisors, Case Series

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### Abstract

**Introduction:** Provisional restorations are important and often a challenging part of dental implant. Besides the fact that provisional restorations need to maintain an acceptable function and esthetic appearance until a permanent restoration is placed, they also serve as placeholder to prevent migration of neighboring teeth and extrusion of opposing teeth. They are also important for determining the best restorative design for the given scenario and providing a template for soft tissue contouring and maturing.

**Objectives:** To describe the different types and techniques of how to do temporary (provisional) for patient who have had implant surgery during period of healing for esthetic wise. The information contains the following elements: a- Types of provisional restorations used during healing periods. b- Discussion 3 patients who have had implant surgery in the esthetic zone and replacing by different types of provisionalization. c- Techniques how to do esthetic provisionalization in these special types of patients.

**Material and Method:** Six implants were placed in esthetically demanding sites (Bilateral congenitally missing lateral incisors) in three patients (1 female, 2 male) age range of 19 to 25 years old, following second stage approach and different provisional methods were used (Maryland bridge, essix retainer with crowns, Hawley retainer with crowns, and screw retained provisional crowns), then clinical observation was performed with the aid of periodontal measurements, patient satisfaction scale, gingiva and supporting structures features and x-rays.

**Conclusion:** There are several ways used in Provisionals of implants in case of congenitally missing lateral, each way has its advantages and drawbacks.

**Keywords:** Provisional Restoration; Implant Placement; Bilateral Congenital; Maxillary Lateral Incisors

### Introduction

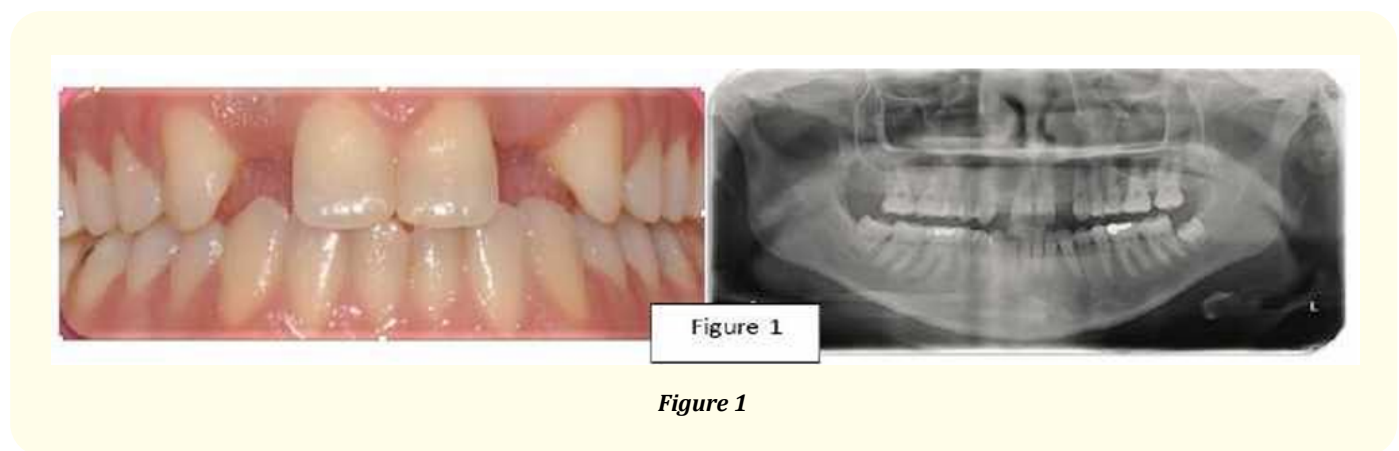
Provisional restorations are prosthesis designed to enhance aesthetics, provide stabilization and/or function for a limited period of time, and should be replaced by a definitive prosthesis after a period of time [1]. Provisional restorations are an important and is often a challenging part of dental implant. In addition, provisional restorations are needed to maintain an acceptable function and esthetic appearance for a temporary time until a permanent restoration is decided to be placed. Provisional restorations also act as a placeholder to

the edentulous area in order to prevent migration of neighboring teeth or extrusion of opposing teeth. Provisional restorations are also important for deciding the most suitable restorative design for each case, in addition to provide a template for soft tissue healing and contouring.

### Case Series and Discussion

#### Case 1

A 20 Year old female referred from orthodontic department to implant clinic after finishing re-distribution of spaces, her chief complaint was “I feel shy when smiling without teeth”, she was physically healthy with no history of dental trauma, she had slightly convex facial profile with lip competence. Upon intra-oral examination patient was shown to have class I molar relationship right and left, and class I canine relationship right and left. Congenitally missing tooth #12, 22. Speaking of prevalence of hypodontia and developmental malformation of permanent teeth in Saudi Arabia among schoolchildren it was found that the most frequently missing teeth in Saudi Arabian children were the lower second premolars, followed by the maxillary lateral incisors and the maxillary second premolars. Agenesis of Saudi Arabian lateral incisors were significantly more frequent in maxilla ( $p < 0.05$ ) than in the mandible [2]. The patient maxillary dental midline was coincided with facial midline, but mandibular dental midline was shifted 2 mm to the left side, overbite was 10% (Figure 1). According to house classification patient was philosophical type.



**Figure 1**

The restorative replacement of congenitally missing maxillary lateral incisors raises several treatment planning concerns. Therefore, it is beneficial to use an interdisciplinary treatment approach to obtain the most predictable outcome [3]. Upon soft tissue examination, patient was found to have healthy attached gingiva of 5 mm width with pink, firm, and stippled appearance. As well as free gingiva with pink, firm, and flat consistency. Probing depth was generalized 2 to 3 mm all over. With thick biotype. Patient had no mobility in any of the teeth. Upon space analysis the mesiodistal width of tooth #12 was found to be 6 mm, while #21 was 7 mm. bone width was read at 3 sites, at crestal bone, then 3 mm from crest, and 6 mm from crest. At the site of tooth #12 readings were 3 mm, 7 mm, and 8 mm respectively. For tooth #33 bone readings were 4 mm, 5.8 mm, 6 mm, 9 mm respectively.

Proposed treatment plan for the missing upper lateral incisors was to surgical place implant fixture are the missing area of #12, #22 (Figure 2) followed by implant retained all ceramic crowns. Two stage technique was chosen for this treatment which included Local anesthesia 4% articaine with epinephrine, followed by Midcrestal with intrasulcular incision one tooth mesial and distal for #12, #22. As-

traTech (Osseospeed) size 3.0 x 11 mm implant fixture for both sites and cover screw were placed. Followed by simple interrupted suture using Vicryl 4-0 and left for 2-month healing period. Hawley retainer with #12, #22 porcelain crowns was placed (Figure 3).



**Figure 2**



**Figure 3**

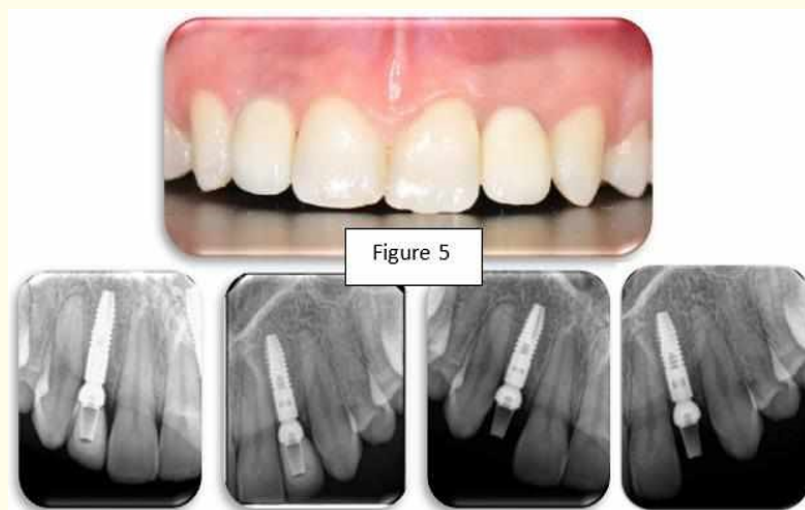
After the 2-month duration, a second stage surgery was done to the implant sites, and temporary implant abutment and provisional crowns were placed (Figure 4). One of the advantages of placing custom provisional restoration instead of healing abutment at second stage surgery is to generate the exact emergence profile immediately and to allow the soft tissue to heal to its desired dimension.



*Figure 4*

Reaching to the prosthetic phase of treatment, conventional loading was done using cement-retained IPS [4].

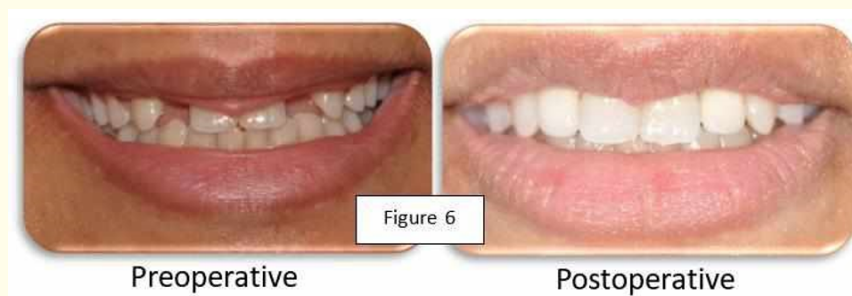
e.max press crowns abutments with an implant level impression type. Hybrid abutments were used with shade A3 selection. Concerning Using Lithium-D-silicate Hybrid Abutments for Implant Restorations, IPS e.max, pressable lithium disilicate offers a solution in combination with a titanium abutment, enabling laboratory ceramists and dentists to provide implant restorations that demonstrate predictable function, esthetic, without compromising strength, durability and life-like optical characteristics [5]. Figure 5 shows site of #12, 22 after prosthetic part insertion.



*Figure 5*

Furthermore, concerning screw-retained Versus Cement-Retained Implant Restorations current concepts shows that no differences were significantly found between the two types of prosthesis in terms of implant survival or success rates. Prosthesis success rates (> 72 months), cement-retained prostheses demonstrated a 93.2% success, compared with 83.4% with screw-retained prostheses.

It is generally agreed that the current trends to favor cement-retained implant restorations for their superior esthetics, occlusion, ease of fabrication, and reduced chairside time [6]. Finally Implant maintenance and recall consisted of 3 months recall in the first year, followed by 6 months recall in the second year, then an annual visit every year. Figure 6 shows preoperative and postoperative.



**Figure 6**

**Case 2**

18 years old male patient presented to implant clinic referred from orthodontic department, his chief complaint was “I feel ugly while I am smiling due to my front teeth spacing” upon examination patient had congenital missing laterals #12, #22. Patient had no medical history. Family history consisted of diabetes and hypertensive from father’s side and diabetes from mother’s side. Oral hygiene habits included brushing twice daily. Patient is philosophical type according to house classification (Figure 7).



**Figure 7**

Upon clinical examination; extra-oral and intraoral shows normal measures with facial symmetry and an average smile line. Patient had class I molar occlusion right and left sides. With an overbite 3 mm and overjet 2 mm.

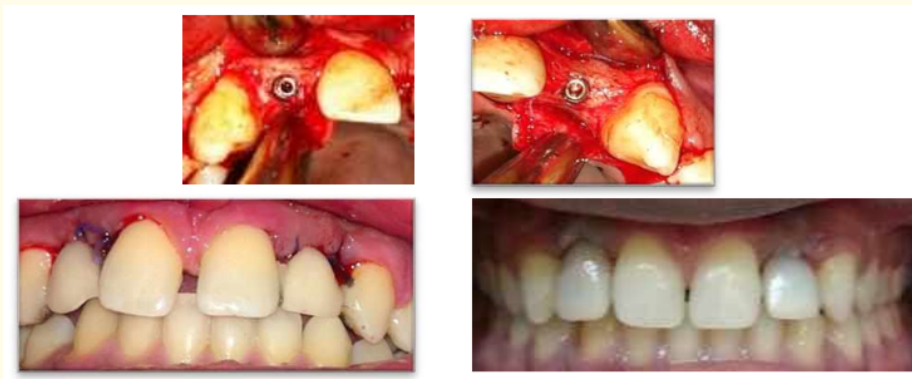


Proposed Treatment plan consisted of orthodontic redistribution for space regaining at side #12, #22, followed by surgical placement of implants at the same site, and with implant supported ceramic crowns. (Figure 8) shows intraoral photo after orthodontic space distribution.



**Figure 8**

Surgical placement of implant consisted of local anesthesia 2 carpules of 2% Lidocaine with epinephrine. Followed by crestal with intra-sulcular incision one tooth mesial and distal + T-shape modified papillary regeneration incision, reflection of flap, then expansion of bone was done for #22 and implant placement of Astra Tech implant system size 3.5x 11 mm for both #12 and 22 then cover screw. Suturing Vicryl with simple interrupted suture technique done and left for four-month healing period. Post-surgical medications prescription included Augmentin 1 gm, Solpadine, ibuprofen and chlorohexidine mouth wash. Then on the same day Maryland Bridge on site #12, 22 was placed after surgery (Figure 9).



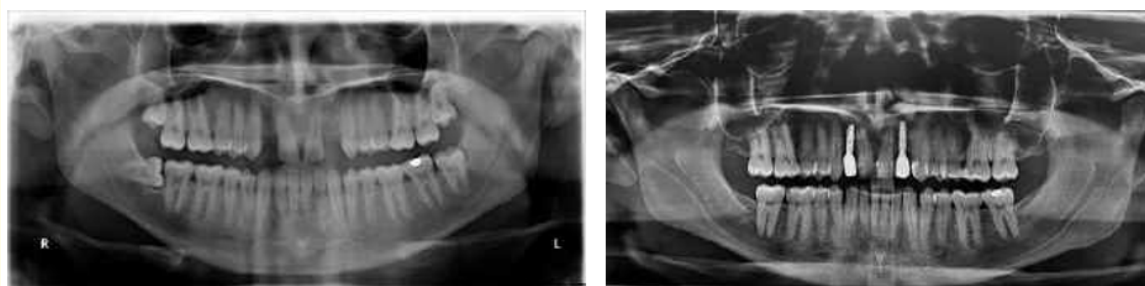
**Figure 9**

After 4 month of healing 2<sup>nd</sup> stage was done and final impression was taken and screw retained provisional crowns were placed for emergence profile and soft tissue healing. After 2-month period insertion of Zirconia cemented crowns was done (Figure 10).



**Figure 10**

Postoperative radiographic OPG (Figure 11). Preoperative radiographic OPG.



**Figure 11**

### **Case 3**

29 years old male patient presented to implant clinic complaining of missing front teeth. Patient is smoking ASA II. Patient had no significant medical and family history, with good oral hygiene brushing twice a day. House classification was philosophical patient. Extraoral examination showed facial symmetry with no swellings and no muscular tenderness. Smile line was average. Intraoral examination showed all parameters within normal limits and bilateral class I molar relation. Vertical overbite was 3mm and horizontal overjet was 2 mm.

Proposed treatment plan consisted of implant placement at site #12, 22. Patient underwent smoking cessation protocol 2 weeks prior implant placement by using 5 A's protocol which consisted of - Ask, Advise, Assess, Assist and Arrange. At the day of implant placement, procedure done consisted of local anesthesia 2 carpules 2% Lidocaine with epinephrine. Midcrestal and sulcular flap with one tooth mesial and one distal + T shape modified papillary regeneration incision, osteotomy site preparation, (Biomet 3i) size 3.25 x 11.5 mm implant with GBR was placed and cover screw then vicryl suture with single interrupted technique. (Figure 12). After 3 weeks provisional essix retainer with crowns at site of #12, 22 was placed.



**Figure 12**

After 6 month of implant placement 2<sup>nd</sup> stage and provisional screw retained crown was placed. Lastly, after 2-month final impression was taken using implant level technique with heavy and light putty impression material and porcelain fused to metal cemented crown was placed at site of implants #12, 22 (Figure 13).



**Figure 13**

## **Conclusion**

This article reviewed the function of implant temporization therapy through implant placement to the final implant restoration. Different provisionalization options were discussed with some cases. Hawley retainer with crowns, Maryland resin bonded bridge, and essix retainer with crowns.

Hawley retainer and essix retainer with crowns serve as a placeholder for tooth in addition to serving as a retainer for post orthodontic phase. Nevertheless, its disadvantage includes that patient would have to place and remove them daily. On the other hand, fixed resin-bonded Maryland provisional would also help those patients that have not had removable prostheses before, in addition to superior gingival healing around the prosthesis. Providing a restoration which has superior comfort and aesthetics. The decision of provisionalization type should be considered during the treatment planning stage and re-considered throughout the implant phase treatment.



In conclusion, there are several ways used in provisionals of implants in case of congenitally missing lateral, each way has its advantages and drawbacks. Clinicians need to be aware of the various options of temporary techniques, materials and temporary implant components.

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