



Aesthetic Correction Of Missing Central Incisor with An Ovate Pontic Bed Preparation and Smile Makeover Using Porcelain Laminate Veneers - A Case Report

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Abstract:

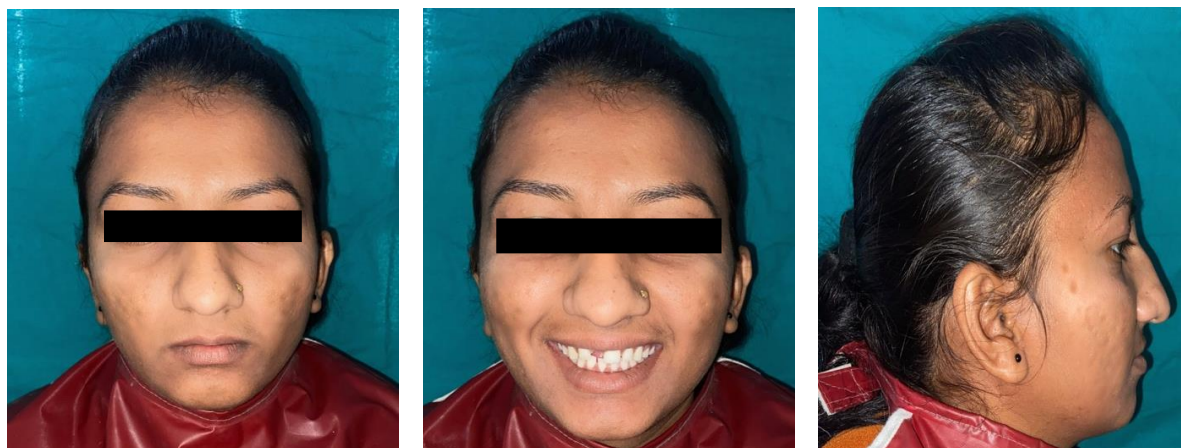
Modern day dentistry aims to restore the form, function, and aesthetics of patients who are fully or partially edentulous. Despite of many therapeutic options available, replacing an anterior tooth remains a significant undertaking. A pontic is an artificial tooth attached to a fixed dental prosthesis that replaces a lost natural tooth, restores its function, and often takes up the area that the clinical crown once filled. It fulfils both the functional and cosmetic needs of replacing a tooth. It's crucial to construct a pontic in the anterior aesthetic zone that can be easily cleaned and doesn't have any "black triangles." The ovate pontic was created to give the appearance that a tooth is poking through the gums. Its convex shape results in the formation of concave gingival tissue. The shortcomings of the ovate pontic were addressed by the development of a modified ovate pontic design. The modified ovate pontic is less curved and has a smaller soft

tissue-contacting surface than the ovate pontic. To replace an upper front tooth with healthy tissue and aesthetics, this article gives a case report of aesthetic correction followed by pontic bed preparation.

Keypoints: PLV'S- Porcelain laminate veneers, ovate pontic, aesthetics.

Introduction: It is generally recognized that tooth loss has an adverse effect on the patient's facial aesthetics, phonetics, mandibular posture, swallowing, and chewing, all of which may cause social and emotional pain^{1,2}. When aesthetics are concerned, replacing missing teeth has always been a challenge in fixed prosthodontics³. Therefore, proper attention must be paid to achieve a precise treatment outcome. Different prosthodontic techniques are available to treat lost papillae or alveolar ridge defects when surgical pre-treatment is undesirable or contraindicated, such as adjusting the contact point, shrinking the embrasure space to produce a papillary illusion, and using pink ceramics⁴. To improve aesthetics and functionality in the anterior region, the basal contour of the pontic has also been altered. A successful therapy must include long-term temporary restorations.

Pre-treatment Extraoral Photographs:



Case report

- A 26-year-old female patient reported to the Department of Prosthodontics with the chief complaint of the missing teeth and poor aesthetics in anterior region and uneven spacing in maxillary anterior region. Patient had history of RTA due to which she lost her tooth
- A full functional occlusal evaluation was done as a part of the clinical examination. This included the following: -
 - ❑ The incisal level of adjacent and opposing teeth,
 - ❑ Inclination of all anterior teeth and the type of occlusion.
- On examination: It was observed that her right maxillary central incisor was missing (11). The right maxillary lateral incisor (12) was tilted slightly palataly and mesially. There was spacing in between lateral incisor and canine of right side (12 and 13) also in between left central incisor, lateral incisor and canine (21,22 and 23). The right mandibular first molar (46) was grossly decayed. It was observed that the pontic space was wider than the required width of central incisor (11).
- The following treatment options were available.
 - ❖ Implants
 - ❖ Fixed partial denture
 - ❖ Removable partial denture
- Implant was excluded as treatment option due to anatomic limitations also the placement of implant would not have solved the aesthetic concern of the patient.
- Removable partial denture option was eliminated as patient was not willing for it.
- To get a good aesthetic results, a multidisciplinary approach was undertaken for this patient.

Pre-treatment Intraoral Photographs:



Frontal



Left Lateral



Right Lateral



Maxillary Occlusal



Mandibular Occlusal

Endodontic Corrections:

- RCT of right lateral incisor (12) was performed due to its mesial tilt leaving less space for crown of central incisor (11) compared to crown width of left central incisor(21) as tooth preparation required more preparation on mesial surface.

Periodontal Corrections:

- Pontic width was less, so pontic bed preparation was done following bone reduction and suturing (figure 1A and 2B). Crown lengthening procedure and gingival zenith corrections of the patient was done in order to achieve better aesthetic outcome (figure 2A and 2B)..

Pontic Bed Preparation with Bone Reduction



Fig. 1A Pontic bed preparation with bone reduction



Fig. 2B Post-operative suturing

Crown Lengthening Procedure Done for Gingival Zenith Correction



Fig. 2A aesthetic Zenith correction



Fig. 2B Operative

Prosthetic Corrections

- Diagnostic impressions were made to evaluate the space for pontic followed by mock preparations and diagnostic wax up was done for maxillary central incisor(21) and lateral incisor(12), with right canine(13), left lateral incisor(22) and canine(23) being prepared for laminates. A interim restoration was fabricated in tooth coloured acrylic resin by indirect technique using putty index, to avoid irritation to prepared pontic bed tissue surface of interim crown was kept highly polished.
- The interim restoration was inserted immediately right after pontic bed preparation. The interim crown was retained using composite resin and orthodontic SS ligature wire.(figure 3A and 3B)
- The tissue condition was monitored after every 1 week for 2 months in each recall, the health of soft tissue was assessed by removing the interim restoration, in each visit the provisional pontic was modified by relining and polishing the tissue surface.
- Following principles of tooth preparations the right latera incisor(12) and left central incisor(21) was prepared to receive a 3 unit bridge of full coverage monolithic zirconia.

- Right canine(13), left lateral incisor(21) and canine(23) was prepared to receive PLV'S- Porcelain laminate veneers with palatal wrap.
- Following the tooth preparation, gingival retraction was done with the prepared teeth and final impression was taken with elastomeric impression material (Figure) and was poured in die stone and the master casts was prepared.
- Appropriate tooth shade selection was done and master cast was send to ceramic laboratory.
- On receiving the restoration, it was checked for proper marginal adaptation and complete seating of restoration was verified.
- As no adjustments were required, the anterior region was isolated and 3 unit bridge was bonded using glass ionomer cement.
- To receive laminates 13, 22, 23 were etched with 37% phosphoric acid, bonded and cured with flowable composite.



Fig. 3A Splinting of interim crown



Fig. 3B Occlusal view



Pre-operative



Post-operative

Discussion:

Implant-supported prosthesis has significantly reduced the need for two abutments to support a pontic, and is one of the most conservative approach. But in certain cases with spacing where spaces cannot be managed, Fixed partial dentures are the preferred option, considering tooth structure conservation and minimal restorative material contact with gingival tissues. The ovate pontic was developed to fulfill esthetic and functional requirements, but its convex design may not allow floss to pass through the center, especially in the anterior teeth area. A modified ovate pontic is less convex and requires minimal ridge augmentation.

The modified ovate pontic offers lateral tissue support and food deflection, with axial contours forming a deflection ridge to prevent food impaction while providing a massaging action to the gingival. Studies by Ursula et al⁵ in 2002 suggested that long-term mucosal health can be maintained with an ovate pontic design, provided the infra-pontic area is carefully adapted and regularly cleaned.

The ovate pontic comes in contact with a larger area of underlying soft tissue and applies very light pressure, resulting in a thinner epithelium with shorter rete pegs. Adequate adaptation to the alveolar ridge mucosa with daily hygiene management did not cause substantial changes in the height of the epithelium and rete pegs.

The keratin layer in the pontic site is thinner than in the reference area, contributing to the protection of the masticatory mucosa against mechanical and/or microbial insult. The enhanced volume of inflammatory cells in the subepithelial zone of pontic sites may be due to this thinner keratin layer.

Oral hygiene procedures are crucial for the health of the tissue. The modified ovate pontic allows dental floss to push the labial gingival margin away and cleanse the tissue surface without difficulty.

Conclusion:

It can be concluded that whenever anterior aesthetic restoration is considered, a multi-disciplinary approach should be taken into consideration to achieve the best aesthetics and

function. As in this case aesthetics were corrected by preparing pontic bed with bone reduction to get more natural and aesthetic looks.

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