

Multidisciplinary Approach for the Management of Widely Open Interdental Spaces with Malformed Teeth: A Case Report

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ABSTRACT

Aim: To describe the management of 45 year old male patient with generalized wide open interdental spaces between anterior teeth, peg lateral incisors by periodontic, endodontic, oral surgery and prosthodontic approach.

Summary: Management of anterior malalignment teeth with open interdental spaces in young individuals generally requires orthodontic treatment. But when this problem is compounded by middle age, poor oral hygiene; the treatment plan changes from orthodontic treatment to prosthodontic intervention preceded by periodontal care. A 45 year old male patient with generalized widely open interdental spaces between anterior teeth, peg lateral incisors was treated by periodontic, endodontic, oral surgery and prosthodontic approach. Multidisciplinary approach to manage such cases results in acceptable esthetics and function. Patient was highly satisfied esthetically as well as functionally after the treatment was completed.

Keywords: Open interdental space, Tongue thrusting, Extra pontic, Peg lateral incisor.

INTRODUCTION

“Esthetics is for young individuals” this axiom does not hold true in today’s world of awareness, and there seems little question that appearance is a key element in social interaction and success. The decision to take care of dental health and smile is not always an easy one. The marked open interdental space with malaligned dentition in an area which is esthetically prominent, associated with disharmony of soft tissue profile in lip region, affects the esthetics of patient and may even cause some psychological problem. Such condition brings many difficulties to routine orthodontic treatment and moreover, the middle aged patients are generally not comfortable with wearing fixed appliances for a period of 1-2 years because of professional and/or social reasons. The paper describes a case report of a patient with marked esthetic disability due to wide open interdental spaces between anterior teeth, cross-bite in canine on one side and edge to edge relationship between canines on the other side. This malocclusion not only had a great impact on the facial appearance of the patient, but was also functionally unacceptable.¹

CASE REPORT

A 45 year old male reported to the Department of Prosthodontics, BBD College of Dental Sciences, Lucknow, India with chief complaint of unaesthetic appearance due to unsatisfactory facial profile with wide open spaces between his maxillary and mandibular anterior teeth (Fig. 1). Medical history did not reveal any specific systemic disease and bad oral habits. Periodontal examination revealed below average oral hygiene, presence of shallow to moderately deep probing pockets in relation to all teeth, and pathological migration in maxillary central incisors (11 and 21), mandibular central incisors (31 and 41), and left lateral incisor (32) along with grade III mobility in 41, 31 and 32. Crossbite was present with respect to left canines and edge to edge bite in right canines. Maxillary lateral incisors were peg shaped and there was generalized wide spacing in the anterior teeth (Fig. 2). On further examination, mild tongue thrusting habit was observed in the patient. Based on clinical and radiographic findings, patient was diagnosed as generalised chronic periodontitis.



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Figure 1: Preoperative extra oral photograph.



Figure 2: Preoperative intra oral photo.

As per the esthetic concern and functional limitations, treatment objectives were to reduce the lip protrusion, correct the axial inclinations of the anterior teeth and also to close the wide open spaces. His tongue thrusting habit was also to be corrected for maintenance of stable occlusion.

Before explaining the treatment plan to the patient, he was motivated to obtain satisfactory oral hygiene and was emphasised on maintaining meticulous oral hygiene for obtaining longterm results. The treatment plan included extraction of grade III mobile teeth, periodontal intervention by scaling and root planing, intentional root canal therapy of maxillary incisors (21, 11), mandibular left canine (33), mandibular right lateral incisor (42) and canine (43), custom cast post- core for mandibular left canine to correct cross-bite. Intentional root canal therapy was done as it was estimated that pulp exposure would occur, while biomechanical preparation of abutment teeth. Extra pontic was planned in between maxillary central and lateral incisor on both sides to manage the wide open interdental spaces.

Crown on maxillary right canine was planned to correct edge to edge bite and esthetics. Mandibular fixed partial denture with extra pontic was planned to replace the extracted teeth and to manage wide space. Habit breaking appliance was also planned after the prosthodontic intervention to correct his mild tongue thrusting habit.²

Diagnostic impressions were made with irreversible hydrocolloid impression material (Plastalgin, Septodont, India) and casts were poured in type III dental stone (Calstone, Kalabhai, Mumbai). Casts were articulated for diagnostic waxing, which was shown to the patient for approval (Fig. 3). Radiological evaluation of abutment teeth revealed sound supporting bone with a crown root ratio of approximately 1:1.



Figure 3: Diagnostic waxup.



Figure 4: Extraction of grade III mobile teeth.

Following thorough scaling and root planing, patient was recommended the use of 0.2% chlorhexidine gluconate oral rinse, twice daily for two weeks. The mandibular central incisors and left lateral incisor were extracted on the same visit (Fig. 4). Immediate removable partial denture with one extra tooth was delivered to the patient (Fig. 5). Intentional root canal therapy was performed on 11, 21, 33, 42 and 43. Post and core preparation was done on left mandibular canine (33) for correcting the cross bite.



Figure 5: Immediate Removable Partial Denture.

Custom cast post and core (Ni –Cr alloy, Bellabond, Bego, Germany) was luted with resin modified Glass Ionomer luting cement (Fujicem, GC, Japan). Biomechanical preparations of teeth was done on maxillary incisors, mandibular right lateral incisor, right canine, left canine and left first premolar. Maxillary right canine was also prepared to correct the edge to edge bite with mandibular canine. Equigingival finish lines were prepared for optimal esthetics and maintenance of gingival tissue health. Provisional fixed partial dentures were cemented with non-eugenol based temporary luting cement (temposil, Coltene Whaledent, Switzerland) at the same appointment.

After the provisional restorations were duly adjusted for protrusive and lateral occlusion balance, impressions were made of maxillary and mandibular arch with provisional restoration in place with irreversible hydrocolloid impression material. Casts were poured in Type IV dental stone. Facebow record was transferred on the semi-adjustable articulator (Hanau H series). A custom incisal guide table was fabricated from self cure acrylic resin (Travalon, Dentsply, India). Final impressions of prepared maxillary and mandibular teeth were made with addition silicone by putty wash technique (Aquasil, Dentsply, Milford, USA). Impressions were poured in type IV dental stone, mounted on semi-adjustable articulator with the help of previous mounting. Metal coping trial for maxillary and mandibular fixed partial denture was done (Fig. 6).

In maxillary arch, three unit porcelain fused to metal fixed partial denture was fabricated on right and left side with extra pontic at lateral incisor position to close the wide interdental space. Porcelain fused to metal crown was also fabricated on right maxillary canine.

Eight unit porcelain fused to metal fixed partial denture in mandibular arch with extra pontic at central incisor position was fabricated. Gingival porcelain was added in the embrasure areas for proper gingival contouring and closing the dark



Figure 6: Coping Trial.

interdental spaces. Maxillary and mandibular fixed partial dentures were evaluated for incisal guidance on the custom made incisal table, adjusted and cemented intra-orally with glass ionomer luting cement (GC Gold Label, Tokyo, Japan) (Fig. 7).



Figure 7: Postoperative intraoral photograph.

Patient was instructed for proper hygiene maintenance with super floss and interdental brush.³ Patient was recalled after 24 hrs for post-insertion check up and removable habit breaking appliance was delivered at the same appointment. After this, patient was again recalled every month for minimum 6 to 8 months for regular follow up of appliance and tongue thrusting habit correction. Patient was highly satisfied with esthetics and function (Fig. 8).

DISCUSSION

Multi disciplinary approach was executed to manage the present case including oral surgery, endodontics, periodontics and prosthodontics. A multidisciplinary approach provides the patient with best of treatment



Figure 8: Postoperative extra oral photograph.

procedures and improves the outcome of the treatment. Orthodontic treatment was not advised due to poor anchorage available from posterior teeth and it would have also promoted bone resorption around anterior teeth.⁴ The treatment plan selected for the patient was least invasive, least time consuming and comparatively economical. The treatment plan was achieved after thorough radiological evaluation of abutment teeth in terms of crown root ratio, bone around abutment teeth. The removable partial denture would have not provided the needed esthetics and comfort to the patient; moreover, it would have involved removal of restorable anterior teeth. The implant supported fixed or removable partial denture have greater incidence of clinical complications than conventional fixed partial dentures⁵ due to involved invasive surgical procedures. The implant placement would be time consuming and expensive. Glass Ionomer cement has been advocated for use in cases of suboptimal moisture control.⁶

Meticulous oral hygiene maintenance and regular follow up visits are required for successful prognosis of present treatment option employed.⁷ Super floss is used for cleaning the tissue surface of pontic and thus facilitates oral hygiene

maintenance. The treatment plan and its outcome justify the functionality, phonetics, aesthetics, stability and patient satisfaction with improved appearance.⁸

Smile rejuvenation has a positive impact on an individual's self-esteem and emotional health. The clinical report helped in rehabilitation of an adult patient affected by maxillary protrusion and wide open interdental spacing associated with malposition of canines with a multidisciplinary approach, which has brought an extra ordinary alteration of esthetics and functions.

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