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Prosthodontic management of severely proclined maxillary anterior teeth using modified tooth preparation and osteotomy - A Case Report

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Abstract

A thorough understanding of the objectives and functional demands of the patient is very important in the prosthetic treatment outcome.This clinical case report represents the prosthetic management of a severely proclined maxillary anterior teeth due to failed orthodontic treatment. Treatment objectives were based on esthetics enhancement, psychosocial support of the patient, restoration of form function, phonetics and comfort.The treatment involves extraction with alveoloplasty done in the prescribed region,followed by FPD placement after the complete healing of the site.

Summary: This case illustrates the importance of proper diagnosis and treatment planning.A combined effort of prosthodontist,oral and maxillofacial surgeon and an endodontist helped in the better outcome of the treatment. Through this approach, the patient had a dramatic dentofacial improvement. The patient has reported self-confidence enhanced with the treatment outcome.

Keywords: Proclined Teeth, Maxillary Teeth, Alveoloplasty, FPD, Esthetics, Lip Competency

Case Report

A 34 year old female patient reported to the Department of Prosthodontics, St. Gregorios Dental College, Chelad, Ernakulam with chief complaint of severely proclined maxillary anteriors and was totally unsatisfied with her appearance and desired for better esthetics (Figure 1).There was no relevant medical history. Extra-oral examination showed a convex profile with incompetent

lips (Figure 2 & 3). The past dental history revealed that the patient had undergone orthodontic treatment from a private clinic before 6 years which was not properly completed. As a part of the same treatment uneventful extraction done on 14,24,34 and 44. The panoramic radiograph showed week periodontal support of the maxillary incisors and generalized bone loss of both maxillary and mandibular arches (Figure 4).

Figure 1

Figure 2

Figure 3

Intraoral Examination

The patient presented with bilaterally Angle's class II molar relation and skeletal class II relation with protruded maxillary incisors and canines, producing an overjet of 8.5mm, Grade III mobility on 11,12,21 and spacing between maxillary anterior teeth with moderate gingivitis on remaining dentition. The occlusion was group function bilaterally.

Figure 4

Radiographic Findings

Panoramic and IOPA revealed trabecular bone pattern was irregular with severe bone loss around maxillary anterior and maxillary left posterior teeth. Root morphology of canines and maxillary left lateral incisors was favorable with crown-to-root ratio of 1:2.

Based upon clinical findings, articulated cast, radiographic examination and considering patient's views the following objectives were considered.

- Aesthetics enhancement
- Achieving lip competency
- Socio- psychological support to the patient
- Restoration of function, phonetics and comfort
- Long term stability of treatment.

So prosthetic rehabilitation of the case was decided in two phases as follow:

Phase I

1. Oral hygiene instruction and oral prophylaxis.
2. Mock-up of alveoloplasty on diagnostic cast.
3.Intentional RCT on 22.
4.Tooth preparation on 13,22,23.
5. Extraction of maxillary incisors (11,12,21) and alveoloplasty.
6. Immediate provisional FPD placement replacing 11,12,13,21,22,23.

Phase II

1. Fixed Prosthodontic restorations using PFM (porcelain fused to metal) FPD replacing maxillary incisors and canines. Patient was informed about the chances of persistence of the space distal to 13 and 23 due to the extracted 14 and 24. Patient was given option of including 15 and 25 for closing the same space,but was not willing for the same. After explaining treatment plan, including the risk and benefits of treatment consent was taken.

Treatment Sequence

A study model was fabricated for treatment planning and mock wax-up. In the first phase of treatment, patient received oral prophylaxis and oral hygiene instruction. On diagnostic cast maxillary incisors (11,12,21) were trimmed and tentative alveoloplasty mock-up with labiolingual reduction done. A surgical stent was prepared to guide the surgical procedure. Also mock up wax patterns fabricated including 11,12,13,21,22,23 respectively (Figure 5).

Figure 5

The patient was sent for intentional RCT on 22. After completion of RCT, tooth preparation done on 13,22,23 under LA. The tooth preparation is done in such a way that the labial tooth reduction of 22 is done at an angulation of 45 degrees to accommodate it in the arch, with shoulder finish line in the labial and chamfer finish line in the palatal aspect of the tooth. Impressions of maxillary and mandibular arches recorded using alginate for provisional FPD fabrication (SC-10; Dr Jagdish Lal Sethi; A-a5/1, Wazipur industrial area,Delhi-110052),which was to be cemented immediately after extraction of 11,12,21 and osteoplasty of the labial cortical plate of the same region. Shade of the teeth was selected before the extraction.

Maxillary incisors (11,12,21) were extracted, full thickness mucoperiosteal flap was raised and alveoloplasty with labial reduction was done (Figure 6) under LA with the help of surgical stent. Primary closure of the surgical site was achieved using non-resorbable 3-0 black silk suture material (Lifeline black braided silk USP) (Figure 7) and the provisional FPD was cemented immediately using zinc oxide eugenol cement, which

acts both esthetically and serves as a shield for the surgical site.

Figure 6

Figure 7

Post-operative instructions given and medications prescribed. Patient was instructed to report back after 1 week for suture removal. After suture removal, the provisional FPD was recemented (Figure 8) on the patient and was asked to report back after 3 weeks for healing assessment, final tooth modifications and for final impression.

Patient reported after 3 weeks and upon verification of the healing, the healing was found to be satisfactory. Patient was comfortable from phonetics and functional aspects except the initial temporary phonetics, after that the patient readily adapted to the change made in the anterior teeth. The final tooth modifications was done on 13,22,23.The sub-gingival finish line of radial-shoulder and chamfer design were done on the selected abutment teeth.

Gingival displacement was achieved using knitted gingival displacement cord. Definitive impression of the prepared maxillary teeth was obtained using vinyl polysiloxane impression material. Final casts were generated from type IV die stone. The patient was recalled after 1 week for metal try in.

Figure 8

Figure 9

After 1 week, the metal try in was done and the fit and occlusion verified(figure 10).

Figure 10

Patient was recalled after 1 week for cementation of PFM FPD on 11,12,13,21,22,23.

After 1 week,the PFM FPD on 11,12,13,21,22,23 was verified for its fit and occlusion and cemented using Glass Ionomer luting Cement(figure 11).The patient was satisfied with the esthetics and occlusion.The lips were also found to be competent.

Figure 11

Instructions to Patient

Oral hygiene instructions were given, emphasizing cleaning the restoration margins using dental floss. The patient was given the instructions to seek 6- months Prosthodontic and periodontal recall. Oral hygiene instructions were reviewed. The patient maintained good oral hygiene stated that she was pleased with esthetics, function, and comfort of the prosthesis.

Results & Discussions

This treatment option produced a drastic change in the patient's appearance, by which the patient was very much satisfied. The problem with lip incompetency and the proclined teeth were corrected with the combined approach of a Prosthodontist, Oral and maxillofacial surgeon and an Endodontist. The patient was very much satisfied with the results.

Conclusion

A thorough treatment planning and the execution of the same is important in the success of the treatment. Thus this combined approach treatment modality is a good option for patients with similar concerns.

Abbreviations

FPD: Fixed Partial Denture

PFM: Porcelain Fused Metal

LA: Local anaesthesia

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