Introduction

Oligodontia could be defined as a rare hereditary condition which involves the congenital absence of more than six teeth in primary, permanent dentition or both. Oftentimes, oligodontia presents as a part of a syndrome and very rarely it occurs as an isolated entity. Familial and sporadic presentations of the condition are often linked to different mutations or polymorphism of the Paired Box 9 (PAX9) or Muscle Segment Homebox 1 (MSX1) genes in the oligodontia cases not associated with syndromes. [1] Oligodontia often impacts occlusion and occlusal vertical dimension, which usually results in poor facial appearance and esthetics. Partial edentulism cases resulting from oligodontia usually require multidisciplinary approach. The utilization of All-of-4 dental implant approach has been on the rise and heavily relied on in many full mouth reconstruction cases. The evolution of the dental implants and their components resulted in a more predictable and easier treatment of complicated dental conditions. [2] This treatment modality gained its fame by offering many advantages which include, minimizing the need for grafting procedure by avoiding anatomical structure and allowing more predictable immediate implant placements. The M-4 configuration is a modification of the All-on-4 concept where the two anterior implants are mesially tilted, while keeping the posterior implants distally tilted. This modification of the anterior implants trajectory, allows placement of longer implants without invasion of the nasal cavity. Longer implants are more preferable according to many studies due to the increase of the bone implant contact (BIC) which has a positive impact on the dental implant primary stability and osseointegration. [3]

Case History

61 year-old, Caucasian male patient presented for comprehensive treatment with a medical history that consisted of diabetes with the latest Hb A1c 6.2 which indicates that it’s very well controlled. Chief complaint consisted of that he wanted to restore his dentition and fix his smile. Intraoral examination revealed interclass II mobility, significantly deep anterior bite, lack of restorative space, attachment retained remora partial dentures with defective attachments. Vertical Dimension of Occlusion (VDO) was significantly collapsed. Prosthetic treatment plan included All-On-4 implant supported prostheses for maxillary and mandibular rehabilitation. Surgical treatment plan included full mouth extraction and immediate implant placements. Maxillary and mandibular complete denture setup was done following maxillary cast surgery/modification which was determined based on the maxillary cast correction over positioning and the new plane of occlusion. A maxillary interim complete denture and a mandibular interim partial were processed in ceramic full acrylic resin. A full thickness flap was elevated from 03 – 04, the maxillary central incisor incisal edge was used as reference to make markings on the facial aspect of the maxillary ridge to determine the level of alveoplasty. A Surgical maxillary bone was used to remove the alveolar bone around the maxillary teeth to the line that was marked. Extraction of all maxillary teeth was done with very minimal resistance. Extraction was facilitated by the fact that alveoplasty was initiated first. Surgeone ruler was used to remove the lingual aspect and to plateau the maxillary ridge. The same process was repeated for the mandibular arch. Alveoplasty was done to allow for 10mm of restorative space for each arch and also to hide the PTJ (Prosthesis Tissue Junction). Implants were immediately placed with M-4 Configuration for the maxillary arch. Interims were delivered to restore esthetics. After 3 months of healing, the implants were uncovered surgically and multisplit “Angled” abutments were delivered and torqued to 30N/cm2, the interim dentures were converted into fixed prostheses for better function and comfort. After soft tissue healing, fixture level impressions were made using RVS. The impressions were poured using Polyurethane IV dental stone with minimal expansion. The master cast was verified using verification jig. The case was mounted on a semi-adjustable articulator using facebow and centric relation record. A denture teeth setup was done and was tried in the patient mouth to evaluate esthetics and function. The setup was sent to Atlantis Dentsply for fabrication of Screw Retained Titanium framework with Angled Screw Access in for the maxillary arch. Titanium framework was tried in and verified clinically and radiographically for adequate passive fit. The Phonares Ivoclar denture teeth were mounted on a semi-adjustable articulator using facebow and centric relation record. A maxillary cast surgery/modification which was determined based on the new incisal edge position and the new plane of occlusion. A maxillary central incisor incisal edge was evaluated by esthetics and phonetics and was moved 7mm. The increase in the VDO not only prepared space for the planned implant supported prostheses but also significantly improved the facial esthetics and harmony. The incisal edge was evaluated by esthetics and phonetics and was moved 3mm gingivally. After the prostheses were planned, the amount of the intended alveoplasty was measured. Using implant implant planning software, with the consideration of the amount of alveoplasty, the maxillary alveolar bone was assessed, there was space to place only 8mm long anterior implants. Mentally tilting the anterior implant allowed for placement of 11.5mm long implants. This placement led to the M-4 configuration. The use of multisplit abutments [5] and the angled screw access [6] helped significantly with making the final prostheses more esthetic by keeping the screw access holes in areas of the prosthesis with least visibility. On the left side of the maxillary prostheses, the access hole was made to facially emerge in the prosthetic gingiva and was sealed with pink Trax. This allowed for superior esthetics.

Discussion

For a full-mouth rehabilitation case, three factors are crucial: the vertical dimension of occlusion (VDO), the centric relation (CR), and lastly the incisal edge position. In this presented case, the VDO was significantly collapsed even with the existence of the removable partial prostheses. The VDO assessed was increased by 7mm. The increase in the VDO not only prepared space for the planned implant supported prostheses but also significantly improved the facial esthetics and harmony. The incisal edge was evaluated by esthetics and phonetics and was moved 3mm gingivally. After the prostheses were planned, the amount of the intended alveoplasty was measured. Using implant implant planning software, with the consideration of the amount of alveoplasty, the maxillary alveolar bone was assessed, there was space to place only 8mm long anterior implants. Mentally tilting the anterior implant allowed for placement of 11.5mm long implants. This placement led to the M-4 configuration. The use of multisplit abutments [5] and the angled screw access [6] helped significantly with making the final prostheses more esthetic by keeping the screw access holes in areas of the prosthesis with least visibility. On the left side of the maxillary prostheses, the access hole was made to facially emerge in the prosthetic gingiva and was sealed with pink Trax. This allowed for superior esthetics.

Conclusions

Proper diagnosis and treatment planning of full mouth cases will result in achieving of excellent esthetics and function. The M-4 configuration allowed for placement of longer maxillary implants and allowed also for good anteroposterior spread (A-P spread). The utilization of multisplit abutments and angled screw access facilitated the manipulation of the screw access holes which lead to excellent esthetics.

References