

## **Tracking Tooth Movement with Digital Technology Post Total Glossectomy**

### **Introduction:**

Skeletal growth and dentoalveolar changes throughout life is expected. Recent study demonstrated tooth positional changes for normal aging varied from 1.42 to 1.94 mm over a 40 year span as a baseline. <sup>(1)</sup> This report demonstrates significant tooth displacement in a total glossectomy patient, who had contraindication for orthodontic treatment due to history of external-beam radiation therapy. The purpose of this report is to visualize tooth movement using digital technology. This report will aid in future dental recommendations for total glossectomy patients.

### **Case Details:**

Patient is 38-year-old female with extensive adenoid cystic carcinoma of the left base of tongue treated with surgical resection and microvascular reconstruction with a Profunda Artery Perforator flap. Subsequently, patient was treated with intensity-modulated proton radiation therapy, that resulted in noticeable atrophy of the free-flap reconstruction, as well as impacting her speech and swallowing. A prosthesis was made to reconstruct the anatomical missing structures, provide maximum intercuspation, and aid in speech and swallowing functions. She was followed for two years and needed multiple adjustments for passive fit of the prosthesis around her dentition.

From the impressions made during the prosthetic rehabilitation, the initial and followup stone casts were scanned using Degree of Freedom scanner (3DDDS, Alpharetta, GA) and exported as STL files into three-dimensional inspection and metrology software (GeoMagic; Patterson Dental, Saint Paul, MN) for measurement of tooth movement. The casts were superimposed according to the position of the clinical crown of premolars for best alignment. The extent of movement in 3D represents the inclination of supra-eruption and/or tilting/rotation of the teeth in two years. The initial and follow-up mounted casts were compared in the Y-axis, to be translated into changes in vertical dimension of occlusion. Color surface maps visually display the direction and amount of tooth movement. The supraeruption of the incisors is concerning due to the bone loss accompanied with the crowding; hence, a guarded prognosis. The reduction of vertical dimension and increased horizontal overjet was also noted.

### **Conclusion:**

Clinical relevance of tracking tooth movement using digital technology enhances the timing and type of intervention. Stabilization of the dentition to prevent unpredictable dental movement in this type of patient is certainly needed.