

“Redefining Smile-A Multidisciplinary Approach”

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ABSTRACT

This article presents a case report of a 20 year old female who was very much dissatisfied with her facial appearance and smile. On examination, it was found that there was a Angles class II division 1 malocclusion and a generalised spacing in the anterior teeth, with a retained, deciduous, left maxillary canine and a malposed 15. On radiographic examination, an impacted 18, 23 was noticed. As the part of the treatment plan, the retained deciduous canine and the impacted permanent canine were extracted and an orthodontic

correction of the malocclusion was accomplished. The missing canine was planned to be replaced with a fixed partial denture. The short clinical crown height of the abutment teeth was increased by crown lengthening procedures and the pontic space was contoured to receive a ovate pontic by using diode lasers. The missing tooth was restored by using an all ceramic three unit zirconia bridge. This multi-disciplinary approach improved the smile of the patient and it ultimately enhanced her aesthetics and self confidence.

Key words: Class II division I malocclusion, Edge wise appliance MBT 0.022 slot, Impacted canine, Crown lengthening, Diode lasers, Ovate pontic, Zirconia bridge

CASE REPORT

A 20-year-old female reported to the SIBAR Institute of Dental Sciences, with the chief complaint of a disproportionate display of teeth [Table/Fig-1]. On intra-oral examination, it was found that there was a Angles class II division 1 and a generalised spacing in the anterior teeth, with a retained deciduous left maxillary canine [Table/Fig-2] and a malposed 15. On radiographic examination, an impacted 18, 23 was noticed [Table/Fig-3].



[Table/Fig-1]: Pre-operative photograph



[Table/Fig-2]: Pre-operative intraoral view



[Table/Fig-3]: Pre-operative radiograph

The treatment plan was explained and a written consent was taken from the patient. The treatment plan involved extraction of the impacted teeth, orthodontic correction of the malocclusion with a Pre-adjusted edge wise appliance MBT 0.022 slot [Table/Fig-4],



[Table/Fig-4]: Abutments-compromised clinical crown height

crown lengthening of the abutment teeth, and recontouring of the pontic space by using a diode laser. The amount of soft tissue recontouring in the pontic region was determined by the proximity of the underlying bone, the final aesthetics and the emergence profile of the pontic. A radiographic and probing assessment revealed sufficient sulcular depth which could allow the removal of sufficient amount of gingival marginal tissues, which was consistent with the desired outcome.

There was sufficient free gingival margin which could allow a simple gingivoplasty procedure at the abutment and adequate soft tissue for the pontic space modification. It was deemed appropriate to remove 2 mm of gingival tissue, and the need for accuracy demanded the use of a contact-mode fibre delivery laser. In this case presentation, an 810-nm diode laser (DENLASE) was used to establish the clinical crown lengthening and the pontic space modification [Table/Fig-5]. A study which was done on the clinical evaluation of the crown lengthening by Shobha et al had concluded that the biologic width can be re-established to its original vertical dimension along with 2 mm gain of coronal tooth structure at the end of six months [1].



[Table/Fig-5]: Crown lengthening and pontic space modification with diode Laser

This procedure was accomplished by using a diode laser of wavelength 810-nm (DENLASE). The other parameters include the Beam diameter: 320 μ m, the Emission mode: Gated pulse wave, the Delivery: quartz fiber-contact mode, the Average power: 1.5 W and the Exposure time: 1.0 minutes per tooth.

Following infiltration and local anaesthesia (2% lidocaine, 1:80,000 epinephrine), the gingival tissue was incised with the laser to a point at which a separation was anticipated. In order to preserve the contours and the crown length, the abutments were prepared and the provisional restorations were fitted on the same day [Table/Fig-6]. At the one week's recall visit, the healing was



[Table/Fig-6]: Cemented Provisional restoration

found to be uneventful and the patient had neither post-operative complaints nor any discomfort. At 2 weeks, the final impressions were taken, at which stage the soft tissue surgical sites appeared healed, firm, and healthy. The prosthetic stages proceeded as per the normal restorative treatment and a 6-month post-operative view of the final all ceramic bridge showed good adaptation of the gingival tissues at the crown margins [Table/Fig-7]. The patient's consent was taken for presenting her pictures for publication.



[Table/Fig-7]: Post-operative view

DISCUSSION

During the early times, the conventional surgical techniques (scalpel gingival recontouring) were the main treatment modalities for performing soft tissue surgeries [2]. Although the dental laser was initially introduced in 1959, the entire practice of dentistry has been revolutionized ever since Lasers for dental applications were introduced in 1985 [3]. For most of the soft tissue surgeries, lasers were available treatment option. Some of the authors used the Nd:YAG laser for defining the emergence profile of the abutment and the pontic space in a combined natural tooth/implant-supported fixed prosthesis. Stuart Coletton utilized the CO₂ laser which was set at 4 W in a continuous wave for performing gingivoplasty procedures [4]. Govila V, Gulati M and Govila M, in 2011, performed various soft tissue surgical procedures like frenectomies, gingivoplasties, gingivectomies, vestibuloplasties, depigmentations and second stage implant surgeries by using diode lasers and they achieved significant results [5]. Kenneth used a diode laser to correct the gummy smile of a patient [2].

In the present case, we made use of a 810 nm gated pulse wave diode laser to recontour the tissues and also for crown lengthening. The teeth were prepared and the provisional restorations were given on the same day of the surgery, in order to maintain the surgically gained space. The clinical crown height and the gingival contour which were achieved with the laser therapy were highly remarkable. The ovate pontic which was initially described in the year 1933, was chosen as the pontic design, as it has been suggested to accurately duplicate the emergence profile for the natural teeth, in order to provide an aesthetic, cleanable prosthesis, a pleasing appearance and strength and also, it could act as a matrix for the formation of the stratified squamous epithelium. After two weeks, the patient was recalled and a permanent zirconia prosthesis with an ovate pontic design was fabricated and it was cemented in the patient's mouth. All the ceramic restorations provide a solution for the patients with high aesthetic demands. The monolithic zirconia restorations have been proved to be the most popular materials for restoring the anterior single crowns and a full mouth rehabilitation and also for the patients with para-functional habits.

The ceramic zirconia prosthesis which was cemented had an excellent colour match, which ultimately enhanced the aesthetics and the beauty of her smile.

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