

“Technique to Improve Retention & Support for Natural Tooth Pontic Resin Bonded Bridge.”

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Abstract: Use of natural tooth (autologous or homologous) as pontic for resin bonded bridges in anterior region of jaws, present many advantages in cases where other treatment options are precluded due to poor economic condition of the patient. Two methods are used to connect the natural tooth pontic to abutments i.e. either by directly bonding the pontic to abutment teeth using composite resin, or by use of bonded metal framework to attach pontic to abutment teeth. In either case high long term failure rates are reported to be due to inadequate retention & support to the pontic. A technique is illustrated to improve retention & support of natural tooth pontic in the following clinical report.

Keywords: Resin bonded bridges, Natural tooth pontic, Pontic support, Pontic retention.

I. Introduction

Loss of anterior teeth results in psychological & social trauma to the patient. Of the various treatment options available to replace missing anterior teeth like, removable prostheses, conventional fixed prostheses, an adhesive bridge or dental implant, choice depends on several factors like condition of adjacent teeth, occlusion, patient's desire & financial implications of proposed treatment. In conditions where patient's economic condition is poor, desire of the patient for fixed prostheses can be fulfilled by resin bonded bridge.

The first adhesively bonded fixed partial denture & splint was introduced by Ibsen^[1] & Rochette^[2]. This was followed by introduction of different methods to enhance the micromechanical retention like; lost salt technique, cast mesh, electrolytic & chemical etching. This in conjunction with development of luting cement resulted in “Resin Bonded Bridges” as one of the established treatment options for replacement of missing teeth.

Usually two methods are followed to attach natural tooth pontic to abutments. First one involves directly bonding the pontic to abutments using composite^[3], while second one uses cast metal framework to bond pontic to abutment^[4].

Studies on resin bonded bridge failure showed that peeling force is generated at metal wing & adhesive cement interface resulting in debonding^[5]. Occlusal forces acting on natural tooth pontic tends to push the pontic apically away from the metal framework resulting in bond failure. In order to overcome this problem, instead of using metal wing on the natural tooth pontic, a stump like extension from metal framework in to the pulp chamber is used in present case. Cingulum rests are prepared on the abutment in the form of ledge.

II. Case Report

A 37 years old male patient reported to the department of prosthodontics with chief complaint of missing tooth in anterior region of lower jaw. Past dental history revealed that patient had lost his mandibular left lateral incisor due to accidental blow to anterior region of lower jaw 8 months back. On clinical examination periodontal condition of remaining dentition was good; there were no wear facets or any parafunctional habits (Fig.1). After considering various treatment options available & patient's economical condition, it was decided to replace the mandibular left lateral incisor with natural tooth pontic adhesive bridge. Treatment plan was explained to the patient & patient accepted it.

As patient's own natural tooth was not available, a recently extracted lateral incisor of appropriate shape & form stored in normal saline from another patient was used as pontic. Tooth crown was separated from the root at the level of cements/enamel junction using diamond separating disc. Pulp chamber of the separated crown was debrided & disinfected with sodium hypochlorite. With the help of Gates Glidden drill pulp chamber was enlarged to create divergence cervically. Incisal half of the pulp chamber was filled with glass ionomer restorative cement (Vitro Molar, Brazil), while cervical half was kept open. Natural tooth pontic was adjusted for occlusion & proximal contacts on mounted diagnostic casts.

Cingulum rests were prepared in the form of ledge on lingual surfaces of abutments using diamond points (Fig.2). Impression of the prepared teeth was made by putty wash technique using elastomeric impression material (Speedex, Switzerland.). Impression was poured in type IV dental stone (Kalabhai Karson, Mumbai, India). A separating medium was applied on prepared teeth & adjacent area. Natural tooth pontic was stabilized on the cast at appropriate position using sticky wax on labial portion. Pattern for wings on abutment & stump like extension in pulpal chamber of natural tooth pontic was prepared in pattern resin (GC Dental products, Japan), with pontic at appropriate position on the cast. Pattern was invested & cast in Ni- Cr alloy. Resultant metal framework was sandblasted & checked for fit on the cast. After verifying the fit framework was finished & polished (Fig.3). Natural tooth pontic was cemented to the framework using dual cure self-adhesive universal resin cement (Rely X U100, 3M ESPE, Germany.) extraorally. Framework along with natural tooth pontic was tried intraorally to check occlusion & proximal contacts. After minor adjustments framework was cemented in place using dual cure self-etch adhesive resin cement. Instructions regarding proper oral hygiene maintenance were given to the patient. At 6-month recall visit the prostheses was in proper function with adjacent soft tissue healthy (Fig.4).

III. Discussion

Using natural tooth as pontic for the adhesive bridges has many advantages like; conservation of tooth structure, economical, aesthetic, psychological feeling of having own tooth, favorable soft tissue response to contacting natural tooth, & reduced laboratory time. Despite these advantages, use of natural tooth as pontic is not so popular technique because of high failure rates associated with it on long term basis. This high failure rates are mainly due to inadequate retention & support to the natural tooth pontic. Literature reports that the occlusal forces acting on pontic tends to separate pontic from the metal plate, resulting in bond failure. Thus in order to adequately resist the occlusal forces & thereby enhancing retention & support, a stump like extension from metal framework is used to engage pulpal chamber of natural tooth pontic instead of using metal plate. Further evidence is required to validate the technique on long term basis.

Figures And Tables



Figure.1 – Missing mandibular left lateral incisor at presentation.



Figure.2 – Cingulum rests on mandibular left central incisor & canine.



Figure.3 – Cast metal framework with stump like extension in to pulpal chamber of natural tooth pontic.



Figure.4 – Natural tooth pontic in place at 6-month recall.

Conclusion

A clinical report is presented to illustrate a technique to improve retention & support of natural tooth pontic for long term success.

References

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