

Posterior Maxillary Prosthetic Treatment with Molar Hemisection – A case report

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ABSTRACT

Background: Hemisection is an alternative treatment option for maintaining tooth with multiple root that indicated for extraction. **Purpose:** To reported tooth with multiple root indicated by extraction to be used as a fixed-fixed bridge abutment by extracting the infected root and maintain the healthy one. **Case:** A 53-year-old woman with caries in upper 1st molar teeth in mesiobuccally root that can't be maintained. Patients refuse the teeth to be extracted. **Case Management:** Hemisection treatment was performed on 26 mesiobuccal root, with the addition of bone graft. After the healing process, fixed-fixed bridges were made on 25, 26, 27, 28, with PFM on 25, 26, 27 and full cast crowns on 28 as the material. **Discussion:** Hemisection as a conservative treatment, can be an option for multiple root teeth that has been indicated for extraction but still have root that can be maintained. **Conclusion:** Teeth performed by hemisection treatments can be used as abutments with attention to the selection of patients to achieve long-term success.

Keywords: Fixed-fixed Bridge, Furcation involvement, Hemisection.

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INTRODUCTION

The development in dentistry is currently leads to conservative treatment. The purpose of the treatment is to maintain teeth for as long as possible but with consideration of periodontics, endodontics and prosthodontics for case selection.¹

If a tooth with multiple roots has a caries that involved in one root, a hemisection procedure can be performed. Hemisection is a conservative way of preserving tooth. This procedure aims to maintain as much tooth structure as possible. The end result is predictable, and has a high success rate if periodontal, prosthodontic and endodontic considerations are carried out correctly.^{2,3,4}

Indications of hemisection from an endodontic perspective are endodontic failure, vertical fracture of one root and severe damage. While the contra indications of hemisection include the absence of a root canal so that the endo treatments cannot be done and also fused roots.^{5,6}

Hemisection involves taking the root structure of the tooth through a surgical approach. Good endodontic therapy must be done before hemisection to avoid calcification

of intrapulpal dystrophy and postoperative tooth sensitivity. The furcation area is then smoothed so that it can be cleaned properly to prevent plaque accumulation.² Since hemisected teeth may fail by fractures of root, it is important to restore them with an extra-coronal restoration^{7,8,9}. The purpose of this article was to reported tooth with multiple root indicated by extraction to be used as a fixed-fixed bridge abutment by extracting the infected root and maintain the healthy one.

CASE

A 53-year-old woman came to the Universitas Airlangga Dental Hospital with a chief complaint of wanting to make dentures for her missing upper jaw teeth. Patient was used a bridge denture in the lower jaw. The patient had no history of systemic disease. History of the last dentition was extracted on teeth complained about 7 months ago. No extra oral abnormalities were found.

Intra-orally, there was a loss of teeth 16 and 27, a caries, tartar, and reddish of the gingival. There is a stable occlusion with unilateral balanced occlusion as the dynamic occlusion. The intra oral view can be seen in

Figure 1. Patients do not have bad habits. From X-ray examination, a radiolucent image is found on the crown of the tooth 26 mesial parts reaches the pulp chamber that is not visible on the visual examination of the teeth. The periapical radiographic can be seen in Figure 2.

CASE MANAGEMENT

Preliminary impression was performed and showed in Figure 3. The initial treatment was carried out on patients, DHE, scaling and root canal treatment for 26. The patient was referred to Conservative Department and it was found that the buccomesial root could not be maintained. The patient refuses extraction so that hemisection treatment is an option in this case. The hemisection was performed by the endodontist. Measurement of the work length and endodontic treatment according to

the work length was done and the separation of bifurcation and infected root extraction was performed. Bone graft (Gamacha, Kimia Farma) was given to the bone socket and sutured with the membrane. The post endodontic radiographical view was shown in Figure 4. Fiber splinting is given to the occlusal to prevent mobility.

On the 7th day, the stitch was removed and the fiber splint was disassembled. Patient had no complaints after hemisection treatment, so patient was referred back to prosthodontic department. The treatment was continued on abutment teeth preparation which is 25, 26, and 28. The amount of preparation is in accordance with the material to be used, namely PFM on teeth 25, 26 and full metal in teeth 28 because it has difficult access and a short clinical crown.¹⁰ The result of preparation was shown in Figure 5.

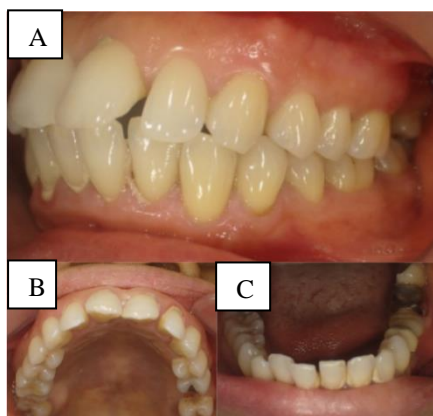


Figure 1. (A) Patient occlusion (B) Maxillary occlusal view (C) Mandibullary occlusal view



Figure 2. X-Ray shown a radiolucency in mesial 26 reaches the pulp chamber

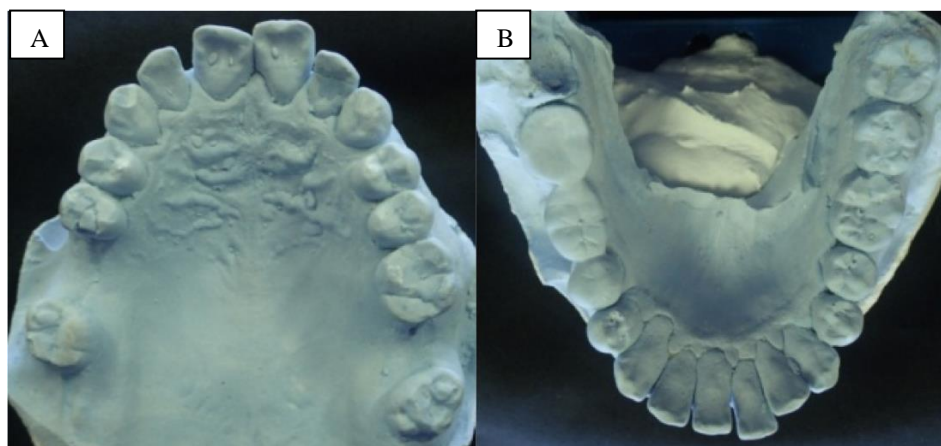


Figure 3. (A) Maxillary cast (B) Mandibullary cast

The application of retraction cord surrounding the abutment and impression was done using double impression techniques with silicone material. This material was used because this material meets the requirements of dimensional accuracy and stability, elasticity, flow, wettability and good versatility.¹¹ Temporary bridge (Structure, Vocco) was made with a putty template from the diagnostic model that has been waxed up. Temporary bridge dentures are inserted with temporary luting. The laboratory process was

done to make a coping for 25,26,27 and full cast crown for 28.

Try in coping were carried out, evaluated and sent back to the dental lab for processing porcelain (Figure 6). A week later the patient returned for control. Patients had no complaints, an evaluation of surrounding tissue and occlusion showed good results so that the bridge denture was inserted permanently using Glass Ionomer Cement Luting (Fuji I GC). At the next control visit the patient had no complaints, clinical examination showed good results (Figure 7).



Figure 4. Radiographical images post hemisection with composite resin splinting



Figure 5. Intraoral view after abutment preparation. (A) Lateral view; (B) Occlusal view



Figure 6. Try in Coping



Figure 7. Final results of fixed-fixed bridge on teeth number 25,26,27 dan 28

DISCUSSION

Hemisection of multiple root teeth has a good prognosis. This tooth can be used as an abutment for bridge dentures. It is a more conservative treatment than having an extraction for the treatment. The teeth treated with hemisection still had the physiological tooth mobility from the remaining roots, making it a better fixed denture abutment compared to osseointegrated implants. To get a high success rate, the margin of the crown must surround the furcation portion of the tooth.²

Hemisection success is influenced by the working procedures. Consideration of case selection, periodontal conditions, restoration, endodontics and treatment should be done with caution. Some conditions that can be considered include local factors like dental anatomy, tooth mobility, crown: root ratio, loss of attachment severity, occlusal relationship between jaws; patient factors like patient's systemic condition, patient's commitment to visit time and costs; and clinical factors like diagnostic capabilities and treatment planning, planning alternative treatment options, and clinical abilities.^{7,10}

Hemisection has been widely used and managed to maintain teeth in the dental arch. However, there are deficiencies associated with surgical procedures, the endodontic failure will cause failure in the entire treatment, the existing surface shape is more susceptible to caries, and must have a good occlusal shape so that it does not give trauma to the periodontal tissues. Since the main cause of failure after hemisection procedure, it needs an occlusal modification to balance occlusal forces on the remaining tooth.^{6,7}

Another alternative treatment option is implant which is a treatment option that can be predicted with good functionalities.² In this case, 26 teeth were extracted and can be implanted in regions 26 and 27. However, patients refused this implant treatment option because of financial reasons and refused tooth extraction.

This case report showed that a hemisection as a conservative alternative treatment, can be an option for multiple teeth that are indicated with extraction. Teeth treated with hemisection can be used as an abutment with consideration to the selection of patients with good oral hygiene, surgical treatment and restoration planning to obtain long-term success.

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