CASE REPORT

Alternatives for restoration of a hemisected mandibular molar

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SUMMARY

Hemisection is a common conservative treatment option for periodontally or endodontically compromised teeth. It is most likely to be performed on mandibular molars with class II or III furcation involvement. Their restoration is more critical than implant surgery to ensure the ability to masticate along with the ability to maintain good oral hygiene. There are various alternatives to restore such types of teeth: the remaining root restored as an individual tooth, restoring individual roots with either a molar or premolar morphology using the adjacent tooth as an abutment in a full coverage fixed partial denture, restoring individual roots with either molar or premolar morphology using an inlay type of restoration on the adjacent abutment tooth. This article reports two cases, one treated with molar morphology and an inlay type of restoration and the other with a premolar morphology and a full coverage fixed partial denture.

BACKGROUND

Hemisection leads to an increased risk of caries in the area of resection due to the increased difficulty in maintaining hygiene of the area and increased stress on abutment teeth if the span is too wide because of the loss of 50% of the root structure resulting in mobility or fracture due to structure loss.^{1 2}

CASE PRESENTATION

Case 1: A 35-year-old female patient reported to our hospital with a symptom of pain and decay on the right side of her mouth. On radiographic examination, the mandibular first molar showed the presence of carious involvement in the distal root ([figure 1](#)). The adjacent premolar and molar were intact and healthy, so a hemisection of the distal

Figure 2 Clinical examination of a hemisected molar (case 1).

root was planned ([figure 2](#)). The opposing first molar and left mandibular molar were absent.

Case 2: A 39-year-old male patient reported with a 3-week history of pain on the lower left side of his mouth. The patient reported a history of root canal treatment in the mandibular first molar since 6 months. Radiographic examination showed a broken instrument in the mesial root of the mandibular first molar ([figure 3](#)), and therefore a hemisection of the mesial root was planned ([figure 4](#)). The examination revealed that all other teeth were intact.

INVESTIGATIONS

Case 1: Intraoral periapical radiograph of 46 confirmed root caries in the distal root ([figure 1](#)). Posthemisection, an intraoral periapical radiograph in relation to 45, 46 and 47 showed the presence of the mesial root and crown structure of the first

Figure 1 Preoperative intraoral periapical radiographs (iopa) (case 1).

Figure 3 Preoperative iopa (case 2).

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Figure 4 Clinical examination of a hemisected molar (case 2).

mandibular molar. The second premolar and molar were sound with good bone support and an appropriate crown-root ratio (figure 5).

Case 2: Intraoral periapical radiograph of 36 confirmed the presence of a broken instrument in the mesial root (figure 3). Posthemisection, an intraoral periapical radiograph in relation to 35 and 36 showed the mesial root of the left first mandibular molar. The second premolar and distal part of the molar were sound with good bone support and an appropriate crown-root ratio (figure 6).

TREATMENT

Case 1: An all metal fixed partial denture with molar morphology for the hemisected 46 and an inlay type of restoration on 47 was planned. Tooth preparations for the same were performed according to biomechanical principles (figure 7). The pontic was of the sanitary type. This option assured conservation of healthy tooth structure, easily cleansable margins, wide

Figure 5 Postoperative iopa (case 1).

Figure 6 Postoperative iopa (case 2).

embrasures and least gingival involvement, which would enable the patient to maintain oral hygiene (figure 8).

Case 2: Tooth preparation was performed using principles of tooth preparation and full metal fixed restoration (figure 9) with pre molar anatomy. Point design was selected as hygienic one to ensure easy clinic and maintenance of tissue (figure 10).

OUTCOME AND FOLLOW-UP

These treatments restored the form and function of the hemisected tooth and improved the patient's ability to chew on the concerned side. It allowed the patient to maintain good oral hygiene and reduce the risk of caries associated with hemisection.

DISCUSSION

Hemisection has been used successfully to retain teeth with furcation involvement. However, there are a few disadvantages associated with it. It can cause pain and anxiety; more susceptibility to caries especially at the site of hemisection, an improperly shaped occlusal contact area, may convert acceptable forces

Figure 7 Tooth preparation (case 1).

Figure 8 Final prosthesis (case 1).

into destructive forces and predispose the tooth to trauma from occlusion.

It is important to consider the following factors while restoring a hemisected molar:

- ▶ Advanced bone loss around one root with an acceptable level of bone around the remaining roots.
- ▶ Angulations and position of the tooth in the arch. A molar that is buccally, lingually, mesially or distally tilted cannot be resected.
- ▶ Length and curvature of roots.^{3 4}

Previously, in 2010, Anthony and his associates demonstrated an alternative treatment for extraction of a whole tooth and salvation of a healthy tooth structure where the patient did not wish to have the tooth removed. In this case, a hemisected molar was restored with individual premolar morphology on

Figure 10 Final prosthesis (case 2).

Figure 9 Tooth preparation (case 2).

the molar and adjacent premolar.⁵ Another case was reported by Anshuman Kharbanda et al⁶, in which a hemisected mandibular first molar was restored with a molar morphology and an inlay type of restoration on the second molar.⁶

For successful treatment outcome one should select the suitable procedures which results in good long term prognosis and key to this is correct diagnosis and treatment planning.

Learning points

- ▶ Hemisection of a mandibular molar may be a suitable treatment option when the decay is restricted to one root and the other root is healthy.
- ▶ This procedure represents a form of conservative dentistry, aiming to retain as much of the original tooth structures as possible.
- ▶ Risk of caries and fracture of the remaining tooth section are complications associated with hemisection.
- ▶ The planned restoration should enable the patient to maintain oral hygiene.
- ▶ The success rates in such procedures are very high if cases are selected judiciously.

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REFERENCES

- 1 Rosenstiel S, Land MF, Fujimoto J, *et al.* *Contemporary fixed Prosthodontics*. 3rd edn. Mosby, Inc: 2001.
- 2 Zafiropoulos GG, Kasaj A, Willerhausen B, *et al.* Mandibular molar root resection versus implant therapy: a retrospective nonrandomized study. *J of Oral Implantology* 2009;35:52–62.
- 3 Ashima BB. Hemi section of a multirrooted tooth-a case report. *Open Access Sci Rep* 2010;1. <http://dx.doi.org/10.4172/scientificreports.336>
- 4 Parmar G, Vashi P. Hemi section: a case-report and review. *Endodontology* 2003;15:26–9.
- 5 Anthony T, Alex S, Igor J. Hemi section as a treatment option: a case report. *Oral Health Group* 2010. <http://www.oralhealthgroup.com/news/hemisection-as-a-treatment-option-a-case-report/1000364333/>
- 6 Anshuman K, Rajiv B, Vineet S, *et al.* Hemi section: an alternative prosthetic management. *Indian J Dent Sci* 2012;4:74–6.

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