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Hemisection: A Silver Lining for the Mandibular Molar

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ABSTRACT

Hemisection of mandibular molar refers to a procedure involving sectioning a multi-rooted tooth with its crown portion followed by the removal of the sectioned tooth with unfavorable prognosis. Hemisection helps in retention of the tooth which otherwise would have undergone extraction. This case report highlights hemisection of mandibular molar with advanced furcation involvement and concomitant endo-perio lesion. This case report also aims at focusing attention in proper diagnosis, treatment planning and management of teeth with advanced periodontal involvement.

Keywords: Hemisectioning, mandibular molar, restoration

Hemisectioning refers to sectioning of a multi-rooted tooth followed by the removal of the sectioned part of the tooth along with its coronal portion. It is a conservative approach, since relatively less affected portion of the tooth is still retained. Loss of first molar can not only lead to drifting of the teeth, but also cause decrease in the vertical dimension of the jaw due to supraeruption of the opposing teeth. Thus, it becomes prudent to preserve the first molar wherever possible. In case of mandibular molar with endodontic and periodontic involvement, careful management and retention of the tooth is challenging. In such cases, hemisection helps in successfully retaining the tooth. The present case report highlights a case of a 35-year-old male patient with endodontic and periodontic involvement of mandibular left first molar, which was treated with hemisectioning and removal of mesial root.

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CASE REPORT

A 35-year-old male patient reported to the Dept. of Periodontics and Oral Implantology with the chief complaint of mobile tooth in lower left region of jaw since past 1-2 months. Patient was apparently alright 1-2 months ago, when he noticed slight mobility in lower left back region of jaw. With passing days, the patient started experiencing difficulty while chewing food and hence reported to the department for treatment of the same. The patient did not present with relevant medical or family history. Past dental history revealed history of root canal treatment with mandibular left first molar 9 years ago and history of re-root canal treatment with the same tooth 6 years ago with recurring abscess in the same region.

Examination

On intraoral examination, the mandibular left first molar presented with Grade I mobility and Grade III Glickman's furcation involvement. The tooth was sensitive on percussion. On probing, the tooth revealed a probing pocket depth of 10 mm on the mesial aspect and 5 mm on the distal aspect. Intraoral periapical radiograph revealed bone loss in the region of furcation (Fig. 1). Bone loss could be observed on the mesial aspect of the mandibular molar. The radiograph also revealed adequate obturation for the tooth. The hematological investigations revealed blood parameters within normal range. Plaque disclosing agent was applied and Turesky-Gilmore-Glickman's modification of the Quigley Hein plaque (1970) index was recorded, which gave a score

Figure 1. Preoperative radiograph.

of 1.2, indicating low plaque score. The gingival index by Loe and Silness (1963) gave a score of 0.9, inferring to mild gingivitis. Intraoral examination also revealed presence of supragingival calculus.

After thorough examination, full mouth scaling was carried out.

Diagnosis

Taking into consideration the history of the patient, diagnosis was given as "Dental biofilm associated gingivitis and localized periodontitis" based on 2017 World Workshop on the Classification of Periodontal and Peri-Implant Disease and Conditions.

Management

Full mouth scaling was carried out and patient was advised 0.2% chlorhexidine mouthwash twice a day. The patient was appointed for follow-up and the area was re-evaluated. At follow-up visit, there was decrease in gingival inflammation. There was no decrease in the mobility and probing pocket depths. The patient was appointed for periodontal flap surgery.

Two percent lignocaine with 1:80,000 adrenaline was injected as local anesthetic agent. Figures 2 and 3 show preoperative buccal and lingual view. With a 15 No BP blade, intracrevicular incisons were given extending from distal half of mandibular second premolar to mesial half of mandibular second molar. A full thickness mucoperiosteal flap was raised. With the help of Gracey's curettes, granulation tissue was removed. After debridement of the area, a vertical fracture line was seen (Figs. 4 and 5). The vertical fracture involved the mesial part of the mandibular left first molar. It was decided to section the tooth and remove the mesial part of the tooth with vertical fracture and retain the distal

Figure 2. Preoperative photograph showing the buccal view.

Figure 3. Preoperative photograph showing the lingual view.

Figure 4. Intraoperative buccal view showing vertical fracture.

root, which had adequate bone support. The distal half of the mandibular molar was relatively unaffected by the vertical fracture. Vertical sectioning was carried out

Figure 5. Intraoperative lingual view showing the vertical fracture.

Figure 6. Intraoperative buccal view after sectioning of the mandibular molar.

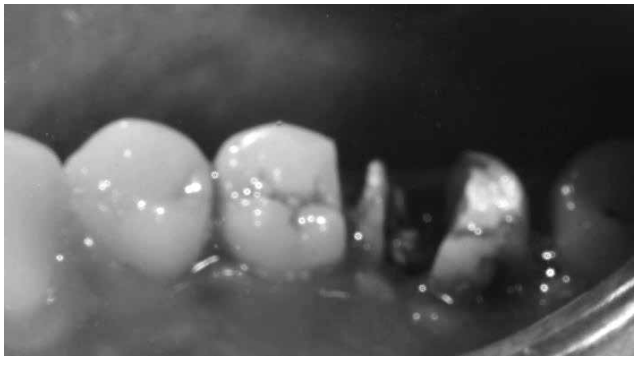

Figure 7. Intraoperative lingual view after sectioning of the mandibular molar.

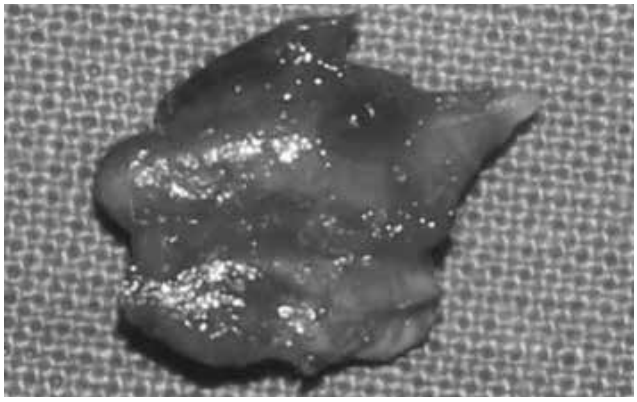

Figure 8. Hemisected mesial root.

Figure 9. 3-0 interrupted silk sutures placement.

Figure 10. Six months postoperative radiograph.

with the help of long shank tapered fissure carbide bur (Figs. 6 and 7). Probe was passed between the two halves of the sectioned tooth to confirm adequate separation has taken place. After verifying sufficient separation, the mesial half of the mandibular molar was removed (Fig. 8). The extraction socket was curetted and irrigated with betadine and saline. The part of the distal root that could be approached after the removal of mesial root, was curetted. The sharp edges of the retained distal root were rounded off. The occlusal table of the retained tooth was relieved to redirect the occlusal forces acting along the long axis of the tooth. The flap was positioned back and 3-0 silk interrupted sutures were placed (Fig. 9). Postoperative analgesics and antibiotics were prescribed. The patient was advised to continue the usage of 0.2% chlorhexidine mouthwash. The patient

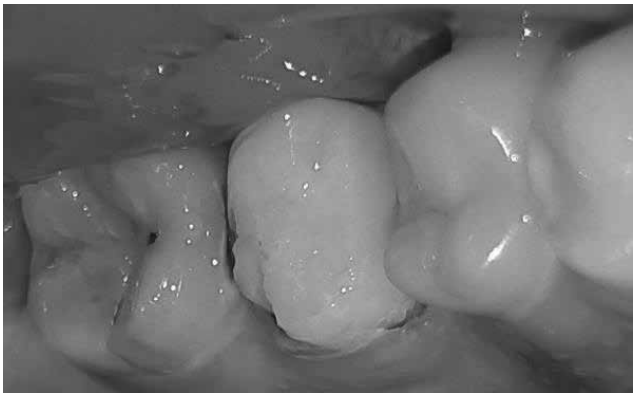

Figure 11. After composite build-up of the tooth.

was recalled for suture removal after 1 week. The patient was followed-up on monthly basis. At 6-month follow-up, the distal section of the tooth did not show any mobility. Intraoral periapical radiograph showed adequate amount of remaining bone present and no further bone loss was observed (Fig. 10). The tooth was built up and restored prosthetically (Fig. 11).

DISCUSSION

The process of hemisection is technique sensitive. In the present case report, endodontic treatment was already carried out. In endodontic-periodontic lesions, endodontic treatment should be carried out before initiating periodontic therapy. By doing this, it helps in eliminating focus of infection and thus preventing re-infection. In addition, there is decrease in postoperative hypersensitivity and intrapulpal dystrophic calcification. Periodontal therapy was indicated as the bone loss in the furcation area was advanced and was not likely to resolve after initial nonsurgical periodontal treatment. In the present case, vertical fracture could only be observed after opening of the flap. As the distal root of the molar showed good amount of remaining bone support and no periapical infection, it was decided to retain the distal root and perform hemisection of the mesial root involving the vertical fracture. Hemisection helps in eliminating furcation region, thus preventing further attachment loss and making oral hygiene maintenance possible. While performing hemisection, the root length, morphology of the roots and the root separation should be taken into consideration. As the roots of mandibular left first molar were adequately separated and were straight in this case, hemisection could easily be carried out. The mandibular molars with periodontal involvement can be maintained after hemisection for a long time depending upon the amount of periodontal destruction. After hemisection, there are chances of increased occlusal forces on the retained tooth section, which can lead to tooth loss due to root fracture. Hence, it is advised to relieve the occlusal table to redirect the occlusal forces.

A tooth with severe endodontic and periodontic involvement with advanced bone loss usually is indicated for extraction as it is challenging to manage such cases and prevent reinfection. Functionally restoring the tooth after extraction can be difficult at times and also can increase the cost of treatment for the patient. Hence, it is judicious to perform hemisection on a multi-rooted root as an attempt to not only preserve the tooth but also decrease the cost of the treatment.

CONCLUSION

The present case report focuses attention on diagnosis and conservative treatment of a tooth with endodontic-periodontic involvement. Proper periodontal maintenance can help in long-term survival of hemisected tooth. Hemisection thus is a viable conservative treatment option for a tooth for its long-term retention.

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