

Management of Disfigured Carious Tooth during Orthodontic Treatment

¹Dr. Dheeraj Gupta, MDS, Postgraduate student, Department of Conservative Dentistry and Endodontics, Rishiraj College of Dental Science and Research Centre, Bhopal, M.P., India

²Dr. Indra Gupta MDS, Professor, Department of Conservative Dentistry and Endodontics, Rishiraj College of Dental Science and Research Centre, Bhopal, M.P., India,

³Dr. Satyendra Gupta, MDS, Reader, Department of Orthodontics and Dentofacial Orthopaedics, Rishiraj College of Dental Science and Research Centre, Bhopal, M.P., India

⁴Dr. Priyal Singh Thakur, MDS, Postgraduate student, Department of Conservative Dentistry and Endodontics, Rishiraj College of Dental Science and Research Centre, Bhopal, M.P., India

⁵Dr. Anubhuti Agrawal, MDS, Postgraduate student, Department of Conservative Dentistry and Endodontics, Rishiraj College of Dental Science and Research Centre, Bhopal, M.P., India

⁶Dr. Gaurav Pandey, MDS, Postgraduate student, Department of Conservative Dentistry and Endodontics, Rishiraj College of Dental Science and Research Centre, Bhopal, M.P., India

Corresponding Author: Dr. Dheeraj Gupta, MDS, Postgraduate student, Department of Conservative Dentistry and Endodontics, Rishiraj College of Dental Science and Research Centre, Bhopal, M.P., India

Citation of this Article: Dr. Dheeraj Gupta, Dr. Indra Gupta, Dr. Satyendra Gupta, Dr. Priyal Singh Thakur, Dr. Anubhuti Agrawal, Dr. Gaurav Pandey, “Management of Disfigured Carious Tooth during Orthodontic Treatment”, IJDSIR- March – 2024, Volume –7, Issue - 2, P. No. 34 – 38.

Copyright: © 2024, Dr. Dheeraj Gupta, et al. This is an open access journal and article distributed under the terms of the creative common’s attribution non-commercial License. Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given, and the new creations are licensed under the identical terms.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Introduction: The aim of orthodontic treatment in patients with malocclusion is to improve the aesthetics of the oral and maxillofacial area and to optimise masticatory function by changing tooth alignment. Dental caries that develop in patients who are undergoing orthodontic treatment can cause inefficient mastication as well as premature tooth loss, thereby impacting quality of life.

During orthodontic treatment of root-filled teeth, we suggest that the monitoring regime for previously traumatized vital teeth be adopted (Levander and Malmgren, 1988; Malmgren et al., 1993), i.e. initial radiographs followed by radiographic monitoring 6 months after the start of tooth movement. Any negligence in monitoring and maintenance may lead to food lodgement and deep caries (no pain) and subsequently tooth loss and treatment failure.

Once such case reported to the department because of complain of severe gingival swelling and discomfort. Radiograph revealed deep carious lesion below then orthodontic band.

Case Report: Patient undergoing ortho treatment (aged 24) with gingival swelling buccal to 36 (no pain) reported to the department of conservative dentistry and Endodontics RVG presented previously root canal treatment with no periapical radiolucency and subgingival decay below orthodontic band.

Treatment plan: Deep Caries Removal, Surgical crown lengthening followed by post and core in 36

Discussion: The mandibular molar in the case after caries removal exhibited insufficient coronal tooth structure with very poor prosthetic prognosis. But loss of this molar would have resulted in complication in continued ortho treatment. Fiber glass multiple post placement was considered for better retention. To gain ferrule from the tooth surgical crown lengthening was done. Mesio Buccal canal was chosen over the mesiolingual canal for the additional post due to the higher concentration of dentin in the danger zone area of the mesio Buccal canal and post was luted by dual cure resin cement. Core was built with the composite to form a mono- block effect over which sutures were placed and patient recalled after 7 days. Suture were removed patient was referred to department of prosthodontics for prosthesis work and referred back to department of orthodontics for continued ortho-treatment.

Conclusion: Secondary Decay in Endodontically Treated Tooth (ETT) during orthodontic treatment can result in failure of the whole treatment.

Keywords: Post and core, Orthodontic Treatment, Oral Hygiene, ETT.

Introduction

The aim of orthodontic treatment in patients with malocclusion is to improve the aesthetics of the oral and maxillofacial area and to optimise masticatory function by changing tooth alignment¹. However, orthodontic treatment can have undesirable consequences, including periodontal disease, root resorption, tooth devitalisation, temporomandibular disorder, caries and damage to enamel^{2,3}. Dental caries that develop in patients who are undergoing orthodontic treatment can cause inefficient mastication as well as premature tooth loss, thereby impacting quality of life^{4,5}. A meta-analysis, based on the results of 14 relevant studies, revealed that the incidence of newly developed dental caries lesions during orthodontic treatment was 45.8%⁷. Sundararaj D in a study⁸ diagnosed dental caries in 350 patients before and after orthodontic treatment, and found that 72.9% of subjects developed new dental caries during treatment.

Cardoso et al. in a sample included a total of 43 patients, 30 women (69.7%), and 13 men (30.2%), nineteen patients (44.2%) had loss of at least one permanent first molar due to anchorage loss, if the molar is lost in between the orthodontic treatment the mean time of orthodontic treatment increases⁹.

The success of orthodontic treatment greatly depends on maintaining good oral hygiene, which can be accomplished using sonic toothbrushes, conventional tooth brushes, ortho brushes, interdental flossing, mouthwashes that remineralize teeth, water flossers, irrigators, and other tools which helps in improving dental hygiene for most patients, pain was the main reason they went to the dentist, followed by tooth decay. Patient's everyday lives, ability to function normally, and quality of life are all negatively impacted by dental pain, which is why the majority of dental visits are focused on

providing urgent pain relief¹⁴. But when the tooth is root canal treated no pain is experienced which leads to negligence and tooth loss.

During orthodontic treatment of root-filled teeth, we suggest that the monitoring regime for previously traumatized vital teeth be adopted (Levander and Malmgren, 1988; Malmgren et al., 1993), i.e. initial radiographs followed by radiographic monitoring 6 months after the start of tooth movement. Any negligence in monitoring and maintenance may lead to food lodgement and deep caries (no pain) and subsequently tooth loss and treatment failure.

Once such case reported to the department because of complain of severe gingival swelling and discomfort. Radiograph revealed deep carious lesion below the orthodontic band.

Case Study

A patient age 24-year-old female was referred from the department of orthodontics with the complain of gingival swelling and discomfort in left mandibular back tooth region for the past 2 days.

History of present illness – Patient experienced gingival swelling since 2 days.

Patient has undergone RCT with the 36 before orthodontic treatment.

Intra – oral examination

- Severe gingivitis and food deposits in left mandibular region with 36
- The probing depth was within normal limit.
- The tooth was not tender to percussion, palpation or biting and not mobile.

Radiographic examination revealed deep sub gingival carious lesion below band. Root canal treated tooth with no periapical radiolucency.

Clinical Examination

Patient was advised to get her band removed and after removal of band, it was observed that tooth was previously root canal treated and amalgam post obturation restoration was done.

On removing of amalgam restoration and secondary decay the remaining sound tooth structure was sub gingival and in-sufficient for direct restoration only.

Treatment Advised

- No root canal retreatment required
- Surgical crown lengthening followed by Post and core with 36

Treatment Done

Orthodontic band was removed and thorough oral prophylaxis was done. Old amalgam restoration was removed; Secondary decay stained and removed. The distal margin of the remaining tooth structure was subgingival and equi-crestal, surgical crown lengthening was performed and 2 mm of crown structure for ferrule was gained for longevity of the restoration.

Post space preparation was done in distal and mesio-buccal canal (apical seal was kept intact) prefabricated posts were luted with dual cure resin cement and core was built followed by prosthetic rehabilitation.



Figure: A, B, C, D.

Discussion

The mandibular molar in the case study exhibited insufficient coronal tooth structure with very poor prosthetic prognosis. But loss of this molar would have resulted in complication in continued ortho treatment. Fiber glass posts demonstrated exceptional survival rates, ease of application, mono-block effect and less appointments¹⁰. multiple post placement was considered for better retention. The prepared tooth margin was at the level of bone crest; to gain ferrule from the tooth surgical crown lengthening was done.

Mesiobuccal canal was chosen over the mesiolingual canal for the additional post due to the higher concentration of dentin in the danger zone area of the mesiobuccal canal¹¹. The anchorage between the core and the remaining tooth structure is provided by the post¹² which was luted by dual cure resin cement.

Core was build with the composite to form a mono-block effect over which sutures were placed and patient recalled after 7 days. Suture were removed patient was referred to department of prosthodontics for prosthesis work and referred back to department of orthodontics for continued ortho-treatment.

Conclusion

Given the prevalence of caries and periodontal issues brought on by food lodgement, maintaining good oral hygiene is essential for people undergoing orthodontic treatment.

Following every meal, one should exercise good dental hygiene. The irony is that decay in endodontically treated teeth does not cause pain, so it does not get patient's or doctor's attention. Instead, it can result in tooth loss, which can result in failure of orthodontic treatment.

References

1. Jung M, Shin S, Jho J. The study on the plaque removal effect by using the several kinds of interdental brushes for fixed type orthodontic appliances. J Korean Acad Oral Health. 2007;31:202–210.
2. Park CH, Hwang HS, Lee KH, et al. A comparative study of electric and manual toothbrushes on oral hygiene status in fixed orthodontic patients. Korean J Orthod. 2004;34:363–370.
3. Wishney M. Potential risks of orthodontic therapy: a critical review and conceptual framework. Aust Dent J. 2017;62:86–96.
4. Martins-Júnior P, Vieira-Andrade R, Corrêa-Faria P, et al. Impact of early childhood caries on the oral health-related quality of life of preschool children and their parents. Caries Res. 2013;47:211–218.
5. Ogaard B, Rølla G, Arends J. Orthodontic appliances and enamel demineralization. Am J Orthod Dentofac Orthop. 1988;94:68–73.
6. Ogaard B, Rølla G, Arends J. Orthodontic appliances and enamel demineralization. Am J Orthod Dentofac Orthop. 1988;94:68–73.
7. Sundararaj D, Venkatachalapathy S, Tandon A, et al. Critical evaluation of incidence and prevalence of white spot lesions during fixed orthodontic appliance treatment: a meta-analysis. J Int Soc Prev Community Dent. 2015;5:433–439.
8. Richter AE, Arruda AO, Peters MC, et al. Incidence of caries lesions among patient treated with comprehensive orthodontics. Am J Orthod Dentofac Orthop. 2011;139:657–664.
9. Cardoso, P.C., Mecnas, P. & Normando, D. The impact of the loss of first permanent molars on the duration of treatment in patients treated with

- orthodontic space closure and without skeletal anchorage. *Prog Orthod.* 23, 32 (2022).
10. Wayakanon, Kornchanok. (2017). Partially Coverage Restoration: An Esthetically Conservative Treatment for a Complex Cavity Restoration. *Open Journal of Stomatology.* 07. 234-241. 10.4236/ojst.2017.74017.
11. Çağlaroğlu M, Kilic N, Erdem A. Effects of early unilateral first molar extraction on skeletal asymmetry. *Am J Orthod Dentofacial Orthop.* 2008;134:270–5.
12. Rebellato J. Asymmetric extractions used in the treatment of patients with asymmetries. *Semin Orthod.* 1998;4:180–8.
13. Hamilton RS, Gutmann JL. Endodontic-orthodontic relationships: a review of integrated treatment planning challenges. *Int Endod J.* 1999 Sep;32(5):343-60.
14. Cohen LA, Bonito AJ, Eicheldinger C, Manski RJ, Masek MD, Edwards RR, et al. Behavioral and socioeconomic correlates of dental problem experience and patterns of health care-seeking. *J Am Dent Assoc.* 2011;142:137–149.
15. Caccianiga, P.; Nota, A.; Tecco, S.; Ceraulo, S.; Caccianiga, G. Efficacy of Home Oral-Hygiene Protocols during Orthodontic Treatment with Multibrackets and Clear Aligners: Microbiological Analysis with Phase-Contrast Microscope. *Healthcare* 2022, 10, 2255
16. Mithra N Hegde and Ashwini KS. “Rehabilitation of Mutilated Teeth - A Systematic Review. *Acta Scientific Dental Sciences* 3.12 (2019): 151-156.
17. Rashmi Bansal, 1Nakul Mehrotra, 1Priyanka Chowdhary, 1and Anuraag Gurtul “Management of Grossly Decayed Mandibular Molar with Different Designs of Split Cast Post and Core” *Hindawi Publishing Corporation Case Reports in Dentistry* Volume 2016, Article ID 2976941, 6 pages
18. Morgano SM, Milot P. . Clinical success of cast metal posts and cores. *J Prosthet Dent* 1993;70(01):11-16.
19. Rahaf Marshad Almutairi, Dalal Jumah Alturaif, Laila Mohammed Alanzi (2023). Importance of Oral Hygiene in Orthodontic Treatment. *Saudi J Oral Dent Res*, 8(3): 100-109.
20. Abozaid, H., & Amer, L. (2021). “Longitudinal evaluation of oral health among orthodontic patients prior treatment, during treatment and posttreatment”, *Al-Azhar Assiut Dental Journal*, 4(2), 167-178.
22. Alavi, S., & Yaraghi, N. (2018). The effect of fluoride varnish and chlorhexidine gel on white spots and gingival and plaque indices in fixed orthodontic patients: A placebo-controlled study’, *Dental research journal*, 15(4), 276–282.
23. Aljohani, S. R., & Alsaggaf, D. H. (2020). “Adherence to dietary advice and oral hygiene practices among orthodontic patients”, *Patient preference and adherence*, 14, 1991–2000.
24. Ayesha, S., Bhargava, A., Philip, A. K., Sam, G., Kumari, D., & George, P. P. (2022). Comparison of the Antimicrobial Activity of Aloe vera Mouthwash with Chlorhexidine Mouthwash in Fixed Orthodontic Patients. *The Journal of Contemporary Dental Practice*, 23(7), 743-748.
25. Buschang, P. H., Chastain, D., Keylor, C. L., Crosby, D., & Julien, K. C. (2019). Incidence of white spot lesions among patients treated with clear aligners and traditional braces. *The Angle Orthodontist*, 89(3), 359-364