Journal Homepage: - www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI: 10.21474/IJAR01/5182
DOI URL: http://dx.doi.org/10.21474/IJAR01/5182

RESEARCH ARTICLE

AMALCORE: STRENGTH AND SUSTAINABILITY- A CASE REPORT.

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Manuscript Info

Manuscript History

Received: 15 June 2017
Final Accepted: 17 July 2017
Published: August 2017

Key words:-
Amalcore, Nayyar, amalgam, retreatment.

Abstract

A 50 year old male patient reported with an asymptomatic, previously endodontically treated and underfilled 47 with no coronal seal present. Endodontic retreatment was carried out with gutta percha solvents, hand and rotary endodontics along with adequate irrigation. As the tooth had thin walls with less remaining dentin, coronal portion of root canals were prepared and restored with silver amalgam along with the rest of the tooth. Crown preparation was done and a porcelain fused to metal crown was placed.

Introduction:-

In many endodontically treated teeth, silver amalgam remains the material of choice because of its ease of manipulation, adequate physical properties, low cost and long proven clinical track record (**Anderson** & **McCoy**, 1993). Also**, Smales** & **Hawthorne** (1997) found the median survival time for extensive amalgam restorations to be 14.6 years.[1] As stated by **Clark** and **Khademi** in 2010, the remaining dentin thickness determines the longevity of any tooth, with an increase in dentin facilitating increased flexibility and increased longevity.[2]

Frequently, a significant amount of dentin has been lost as a result of caries and/or extensive restorations in teeth requiring endodontic treatment. The integrity of the anatomic crown is also disrupted by coronal access, canal enlargement, and chemomechanical preparation. Moreover, decrease in moisture content could also make a tooth brittle after pulpectomy. Therefore, as a result of a decreased amount of dentin, disruption of anatomic form, and possible loss of intrinsic strength, endodontically treated teeth have increased susceptibility to horizontal and vertical fracture.[3] It is necessary to seal the teeth coronally after endodontic treatment[4], to restore them with appropriate post and / or core materials and to rehabilitate such teeth prosthetically. Such treatment will provide the necessary resistance of the tooth against compressive and tensile forces of its adjacent and occluding teeth.[5]

Silver amalgam is a durable material which is often used as a core material negating the need for a metal post by preparing the coronal spaces of the canals and restoring them alongwith the remaining tooth known as **Nayyar**'s[3] Core or AmalCore, as an alternative to placement of post and core which would require more canal preparation. This technique is useful in cases with thin walls and when less than one-third of tooth structure remaining.[6]

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Case Report:-

A 50 year old male patient reported to the Department of Conservative Dentistry and Endodontics, Swami Devi Dyal Hospital and Dental College, Barwala, Panchkula with a previously endodontically treated 47. There was no history of pain, swelling or bleeding from the above mentioned tooth region. Patient was diabetic but on medications for the same. Upon clinical examination the tooth was not post-endodontically restored. There was no tenderness upon vertical or horizontal percussion and palpation. Upon radiographic examination, the endodontic treatment was considered as underfilled (Figure 1). In the treatment plan, re-treatment of 47 and post-endodontic restoration with AmalCore/Nayyar's core and a porcelain fused to metal crown was deemed necessary.

Endodontic treatment was initiated with a Dentsply EndoAccess bur, two canals were located, one mesial and one distal. The previously filled gutta percha obturation material was removed with RC solv (Prime Dental) and H files (Mani). The canals were then prepared with Protaper Universal (Dentsply) till F2. The canals were irrigated with Sodium hypochlorite and Ethylene-diamine-tetraacetic acid. A calcium hydroxide dressing was given for a period of 10 days. The patient was asymptomatic, additionally no pus or blood discharge from the canals or the tooth region was found. Prior to obturation, the last irrigant used was 2% Chlorhexidine (Dentochlor, Ammdent). Gutta percha cones conforming to the finishing file F2 alongwith Zinc oxide eugenol sealer were utilized for obturating both canals (Figures 2 & 3).

The tooth was temporized using Orafil-G. After 24 hours, the tooth was re-accessed. 3mm of gutta percha was removed coronally from the mesial and distal canals using peeso-reamers (MANI) till size 3 (Figures 4 & 5). A tofflemire matrix band and retainer was adapted on 47. Silver amalgam was condensed into the coronal canal spaces following which the entire tooth was built up (Figures 6 & 7). After 24 hours, crown preparation for porcelain fused to metal crown was done, creating a shoulder margin equigingivally, with a Shofu crown preparation kit (Figure 8). Ultimately, the tooth was rehabilitated with a Porcelain fused to metal crown (Figure 9).

Figure 1:- Pre-operative radiograph

Figure 2:- Clinical picture of Obturated tooth 47 representing mesial and distal canals

Figure 3:- Radiographic picture of Obturated tooth 47 representing mesial and distal canals

Figure 4:- Clinical picture of Removal of coronal 3mm of gutta percha from root canals

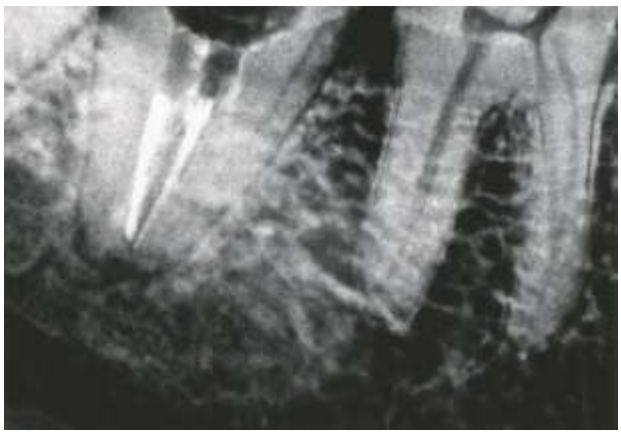

Figure 5:- Radiographic picture of Removal of coronal 3mm of gutta percha from root canals

Figure 6:- Clinical picture of Restoration of the tooth entirely with silver amalgam

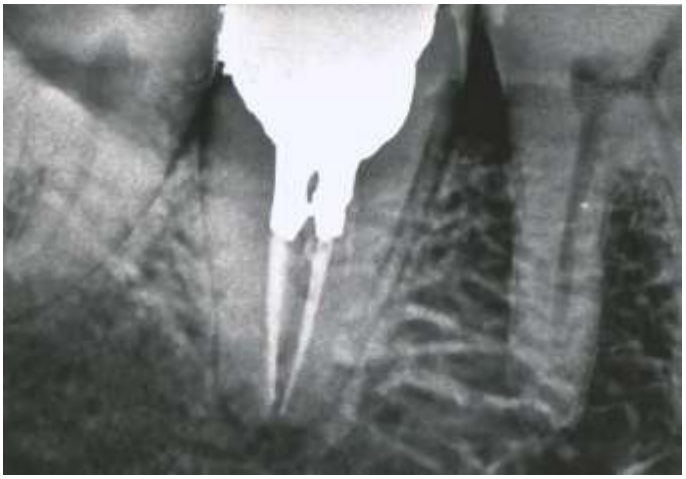

Figure 7:- Radiographic picture of Restoration of the tooth entirely with silver amalgam

Figure 8:- Crown preparation with porcelain fused to crown

Figure 9:- Placement of Porcelain fused to metal crown in 47

Discussion:-

Non-surgical retreatment of an asymptomatic tooth is suggested, as the absence of a coronal seal leads to bacterial contamination especially with *Enterococcus faecalis*. Coronal leakage is also termed one of the reasons for failure of an endodontic treatment necessitating retreatment in the present case before coronal restoration.[4] The post-endodontic restoration of an endodontically treated tooth is dependent upon the remaining dentin thickness of the tooth. In the present case, the mesial, distal, buccal and lingual walls were intact but lacking the required dentin thickness. If the remaining tooth structure is less than one-third, then Amalgam core/ AmalCore/ **Nayyar**'s Core is appropriate for a molar. Also, the preparation of the tooth structure would be less than that required for a metal post.[6,7] The placement of pins in endodontically treated teeth is not advised due to the increased risk of stress cracks during placement.[7]

Although the compressive strength of silver amalgam and composite is comparable[8,9] but the survival probability of silver amalgam in permanent teeth is highest at 3 years(97.2%), 4 years (96.6%), 5 years (95.4%) and 7 years (94.5%) as compared to composite, glass ionomer, Dentin Bonding Agent & composite and ceramic/composite inlay[8], making silver amalgam the appropriate choice in the present case. Moreover, teeth have less flexibility with aging because of an increase in the amount of peritubular dentin formation decreasing the amount of organic materials that may contain moisture[5], necessitating the restoration of the present case with a porcelain fused to metal crown. **Hansen EK** et al (1990) have also found in their 20-year retrospective analysis of 1638 endodontically treated posterior teeth restored with amalgam without cusp coverage, that fracture was a significant problem.[10] Therefore, **Goodacre** has stated that crowns should be placed on endodontically treated teeth that have occlusal intercuspation with opposing teeth thereby strengthening them against expansive forces.[5]

Conclusion:-

Each endodontically treated tooth has to be restored according to the remaining dentin thickness, the longevity of the material used and the stresses which the tooth would undergo after its rehabilitation.

References:-

1. Hachmeister KA, Dunn WJ, Murchison DF, Larsen RB. Fracture strength of amalgam crowns repaired endodontic access. Oper Dent. 2002 May-Jun;27(3):254-8.
2. Clark D, Khademi J. Modern molar endodontic access and directed dentin conservation. Dent Clin North Am. 2010 Apr;54(2):249-73.
3. Nayyar A, Walton RE, Leonard LA. An amalgam coronal-radicular dowel and core technique for endodontically treated posterior teeth. J Prosthet Dent. 1980 May;43(5):511-5.
4. Roda RS, Gettleman BH. Nonsurgical Retreatment. In: Hargreaves KM, Cohen S, editors. Cohen's Pathways of the pulp. 10th ed. Missouri: Elsevier Mosby; 2011. p. 890-952.
5. Goodacre CJ, Baba NZ. Restoration of Endodontically treated teeth. In: Ingle JI, Bakland LK, Baumgartner JC, editors. Ingle's Endodontics. 6th ed. Delhi: CBS Publishers & Distributors; 2013. p 1431-73.
6. Dietschi D, Bouillaguet S, Sadan A. Restoration of the endodontically treated tooth. In: Hargreaves KM, Cohen S, editors. Cohen's Pathways of the pulp. 10th ed. Missouri: Elsevier Mosby; 2011. p. 777-807.
7. McComb D. Restoration of the endodontically treated tooth. Ensuring Countinuing Trust–DISPATCH. 2008:1-20.

8. Rawls HR, Esquivel-Upshaw JF. Restorative Resins. In: Anusavice KJ, editor. Phillips' Science of Dental Materials. 11th ed. New Delhi: Elsevier; 2007. p. 399-437.
9. Marshall SJ, Marshall GW, Anusavice KJ. Dental Amalgams. In: Anusavice KJ, editor. Phillips' Science of Dental Materials. 11th ed. New Delhi: Elsevier; 2007. p. 495-540.
10. Hansen EK, Asmussen E, Christiansen NC. In vivo fractures of endodontically treated posterior teeth restored with amalgam. Endod Dent Traumatol. 1990 Apr;6(2):49-55.