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Retrieval of Rigid Metal Post and Esthetic Management of Anterior tooth- A Case Series

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Abstract : The root canal treated tooth often requires post and placement. Prefabricated metal posts are still commonly used in clinical practice. Drawbacks of these metal posts include esthetic concerns, apart from their inherent rigidity. This case series showcases the management of teeth restored with metal post with fiber post and esthetic replacement of definitive restoration.

Keywords – *Dental operating microscope, Esthetic rehabilitation, Metal and Fiber post, Post retrieval, Ultrasonics*

I. INTRODUCTION

Restoring a tooth that has undergone endodontic treatment is crucial for its long-term success. Teeth that have had root canal therapy often experience a loss of tooth structure from previous restorations, decay, injury, and the access holes created during the procedure [1]. The loss of tooth structure weakens the retention and support for the restoration, making it necessary to use an intraradicular post to help hold the coronal restorative material in place [2].

Various materials, designs, and techniques are available for post restorations.[3]. Intraradicular posts can be categorized by material into metal, fiber, and ceramic posts. Metal posts can further be divided into conventional cast post-and-core systems and prefabricated metal posts [4Prefabricated metal posts are advantageous for preserving the structure of endodontically treated teeth due to their ease of use, high fracture resistance, and shorter chair time required for placement [5]. However, the difference in elastic modulus between metal and dentin can create stress, raising the risk of root fractures and severe failures. [6].

In contrast, many professionals view prefabricated fiber posts (FP) as an alternative to metal posts (MP) because of their aesthetic qualities and elastic modulus like that of dentin, which enhances stress distribution and lowers the risk of irreparable failures.[7].

Traditionally, prefabricated metal posts can be visible through the structure of endodontically treated anterior teeth, leading to an unappealing appearance. This case series highlights the successful removal of metal posts and the esthetic restoration of maxillary anterior teeth.

II. CASE REPORT

2.1 Case 1

A 23-year-old malepresented to the Department of Conservative Dentistry and Endodontics with chief complaint of unpleasant esthetics due to the crown in his upper front tooth region.

History revealed trauma due to fall 7 years ago, following which he underwent root canal treatment and crown placement.

The systemically healthy patient revealed concerns regarding the esthetics in the upper front tooth due to the crown.

Clinical examination revealed display of color of metal through the porcelain fused to metal crown at middle one third of maxillary left central incisor (Tooth number 21). Radiographic evaluation revealed adequate obturation of the root canal with the presence of highly radiopaque structure extending till the coronal third of the root canal with respect to 21.

Diagnosis of Previously treated tooth restored with PFM was made with respect 21. Since the patient was asymptomatic, after explaining the possible outcomes for the tooth, treatment plan was made to remove the esthetically unappealing crown and metal post followed by restoring the tooth with fiber post and all ceramic crown.

In the subsequent visit, crown was disassembled using diamond bur to cut the ceramic and transmetal bur to cut the metal. After the removal of the crown, it was found that there was adequate ferrule remaining. However, exposed metal post and faulty restoration was found. Using ultrasonic instrument, metal post was removed under magnification using DOM.

Following the post removal, post space was prepared and fiber post was bonded to the root canal and adhesive core was build. Pre-existing margins were refined to receive an All-ceramic crown. In the next visit, crown made of IPS E.max was bonded to the tooth 21.

2.2 Case 2

A 19-year-old male presented to the Department of Conservative Dentistry and Endodontics with a chief complaint of unpleasant esthetics due to exposed metal post in his upper front tooth region.Patient gives history of trauma 5 years ago, following which he underwent root canal treatment for the tooth followed by metal post placement.

Clinical examination revealed display of color of metal post through the tooth at middle one third on the palatal surface of the maxillary left central incisor (Tooth number 21). Radiographic evaluation revealed adequate obturation of the root canal with the presence of highly radiopaque structure extending obliquely till the middle third of the root canal with respect to 21.

Diagnosis of Previously endodontically treated tooth restored with metal post and composite build up was made with respect 21. Since the patient was asymptomatic, after explaining the possible outcomes for the tooth, treatment plan of removal of the esthetic metal post followed by restoring the tooth with fiber post and all ceramic crown was devised.

In the subsequent visit, using ultrasonic instrument, metal post was removed under magnification using DOM.

Following the post removal, post space was prepared and fiber post was bonded to the root canal and adhesive core build-up was done. Tooth preparation was done and Zirconia crown was bonded to the tooth 21.

III. FIGURES AND TABLES

3.1 Case 1

Fig.3.1.1 Preoperative

Fig. 3.1.2 Disassembly of crown

Fig. 3.1.3 Removal of metal post

Fig.3.1.4 Fiber post and core build up

Fig.3.1.5 Immediate Post-operative

Fig. 3.1.6 Follow-up

3.2 Case 2

Fig.3.2.1 Pre-operative

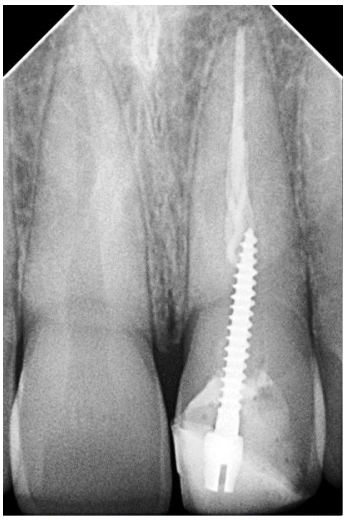

Fig. 3.2.2 Preoperative radiograph

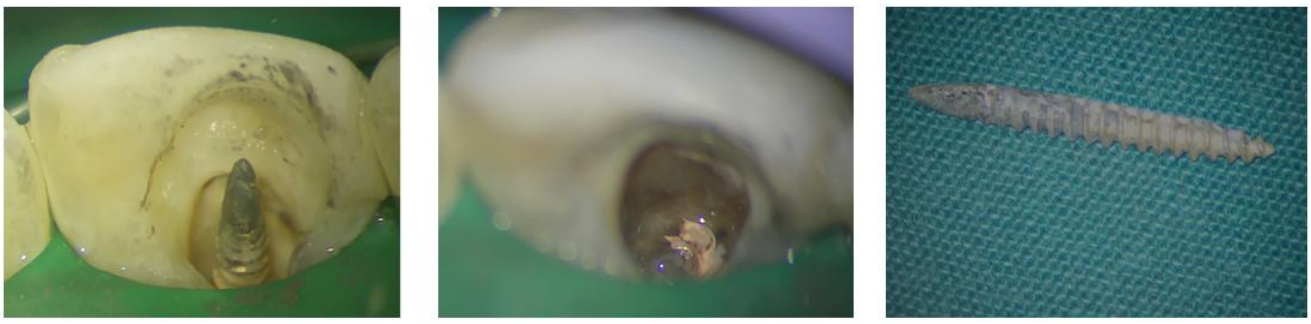

Fig.3.2.3 Post retrieval

Fig.3.2.4 Immediate postoperative

Fig.3.2.5 Follow-up photographs

IV. DISCUSSION

The biomechanics of endodontically treated teeth differ from those of vital teeth[1].Stiff materials used in posts, unlike pulp tissue, create unnatural stresses on restored teeth. Prefabricated posts made from stainless steel and titanium generate greater stresses on the restored tooth structure, particularly at the cervical and apical thirds of the root. [8].

In this case report, although the metal post had functioned well over the years, it was replaced with a fiber post for aesthetic reasons and improved stress distribution. A study by Badami et al. (2022) found that glass fiber posts provide more uniform stress distribution and exert less stress on restored teeth. [8].

Recently, aesthetic restorative dentistry has gained significant attention from both dentists and patients, leading to increased demand for non-metallic, biocompatible, and aesthetically pleasing restorations.

Restorations can be challenging when a metallic core is present due to the undesirable grayish hue that shows through. Research indicates that the underlying tooth structure significantly affects the appearance of ceramic restorations. [10].

When aesthetics isthe priority, dental ceramics are often the material of choice, as they can closely mimic the characteristics of natural tooth structure. Indirect ceramic restorations are widely accepted due to their biocompatibility, high wear resistance, tooth-matching optical properties, realistic surface texture, and excellent translucency, all contributing to superior aesthetic and mechanical performance. [10].

V. CONCLUSION

The case series demonstrates the advantages of replacing metal posts with fiber posts in endodontically treated teeth. Fiber posts offer enhanced aesthetics, improved stress distribution, and a lower risk of catastrophic failures compared to their metal counterparts. While fiber posts may have limitations regarding fracture resistance, their benefits in aesthetic dentistry are significant. Future research could focus on the long-term performance of various post materials and their applications in different clinical scenarios, ensuring optimal outcomes for patients.

REFERENCES

[1] Gupta, R., Prasad, A. B., Raisingani, D., Khurana, D., Mital, P., & Moryani, V. Endodontically Treated Teeth with Fiber-Reinforced Composite Resins: A Case Series. *Journal of Dental Research and Review, 9(4),* (2022), 310-314.

[2] Martins, M. D., Junqueira, R. B., de Carvalho, R. F., Lacerda, M. F. L. S., Faé, D. S., & Lemos, C. A. A. Is a fiber post better than a metal post for the restoration of endodontically treated teeth? A systematic review and meta-analysis. *Journal of Dentistry*, *112*, (2021), 103750.

[3] de Souza Batista, V. E., Bitencourt, S. B., Bastos, N. A., Pellizzer, E. P., Goiato, M. C., & Dos Santos, D. M. Influence of the ferrule effect on the failure of fiber-reinforced composite post-and-core restorations: A systematic review and meta-analysis. *The Journal of prosthetic dentistry*, *123*(2), (2020), 239-245.

[4] Girotto, L. P. S., Dotto, L., Pereira, G. K. R., Bacchi, A., & Sarkis-Onofre, R. Restorative preferences and choices of dentists and students for restoring endodontically treated teeth: A systematic review of survey studies. *The Journal of prosthetic dentistry*, *126(4),*(2021), 489-489.

[5] Marchionatti, A. M. E., Wandscher, V. F., Rippe, M. P., Kaizer, O. B., & Valandro, L. F. Clinical performance and failure modes of pulpless teeth restored with posts: a systematic review. *Brazilian oral research*, *31*, (2017), e64.

[6] Cloet, E., Debels, E., & Naert, I. Controlled Clinical Trial on the Outcome of Glass Fiber Composite Cores Versus Wrought Posts and Cast Cores for the Restoration of Endodontically

Treated Teeth: A 5-Year Follow-up Study. *International Journal of Prosthodontics*, *30(1)*, (2017).

[7] Cui, X., Shen, Z., & Wang, X. Esthetic appearances of anatomic contour zirconia crowns made by additive wet deposition and subtractive dry milling: A self-controlled clinical trial. *The Journal of Prosthetic Dentistry*, *123(3)*, (2020), 442-448.

[8] Badami, V., Ketineni, H., Sabiha, P. B., Akarapu, S., Mittapalli, S. P., & Khan, A. Comparative evaluation of different post materials on stress distribution in endodontically treated teeth using the finite element analysis method: a systematic review. *Cureus*, *14*(9) (2022).

[9] Contrepois, M., Soenen, A., Bartala, M., & Laviole, O. Marginal adaptation of ceramic crowns: a systematic review. *The Journal of prosthetic dentistry*, *110*(6), (2013), 447-454.

[10] Alshouibi, E., & Alaqil, F. Masking a metal cast post and core using high opacity e. max ceramic coping: a case report. *Journal of International Society of Preventive and Community Dentistry*, *9*(6), (2019), 646-651.