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Fifteen-year Clinical Follow-up of Restoration of Extensive Cervical Resorption in a Maxillary Central Incisor

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Clinical Relevance

This multidisciplinary approach allowed us to maintain the tooth and bone height, contributing to the patient's facial esthetics and obviating the need for more complex and invasive procedures, along with the psychological aspect of maintaining the tooth in the dental arch.

SUMMARY

Internal bleaching in endodontically treated teeth requires care and protection to prevent harm to the periodontal ligament due to peroxide and may result in external root resorption. There is a myriad of treatment options when this occurs, such as monitoring, extraction, and subsequent rehabilitation with implants or fixed prosthodontics. In some cases, such as the one described here, a conservative attempt to maintain the tooth as a single structure can be made by sealing the resorptive defect. In the present case, we show a multidisciplinary approach where orthodontics, periodontics, and restorative dentistry were involved in treating the maxillary right central incisor (#8) of a 65-year-old patient with extensive cervical resorption, whose chief complaint was esthetics. The proposed treatment was extrusion of the tooth followed by curettage and restoration of the defect with glass ionomer cement. The patient has been followed for 15 years with no signs of recurrence, maintenance of periodontal health, and patient satisfaction with the esthetic outcome.

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DESCRIPTION OF THE TECHNIQUE

A 65-year-old patient sought dental treatment mainly due to esthetic concerns, and the initial periodontal evaluation indicated the presence of a subgingival cavity in the root surface of tooth #8 (maxillary right central incisor). The patient's medical history revealed internal bleaching of tooth #8 six years before. A periapical radiograph showed extensive structural loss directly related to external cervical resorption (Figures 1 and 2). Conventional treatment would involve tooth extraction and placement of an osseointegrated implant. However, at that time, implants did not have the esthetic features and dimensions that they do today.[1] Moreover, the technique should be mastered, and

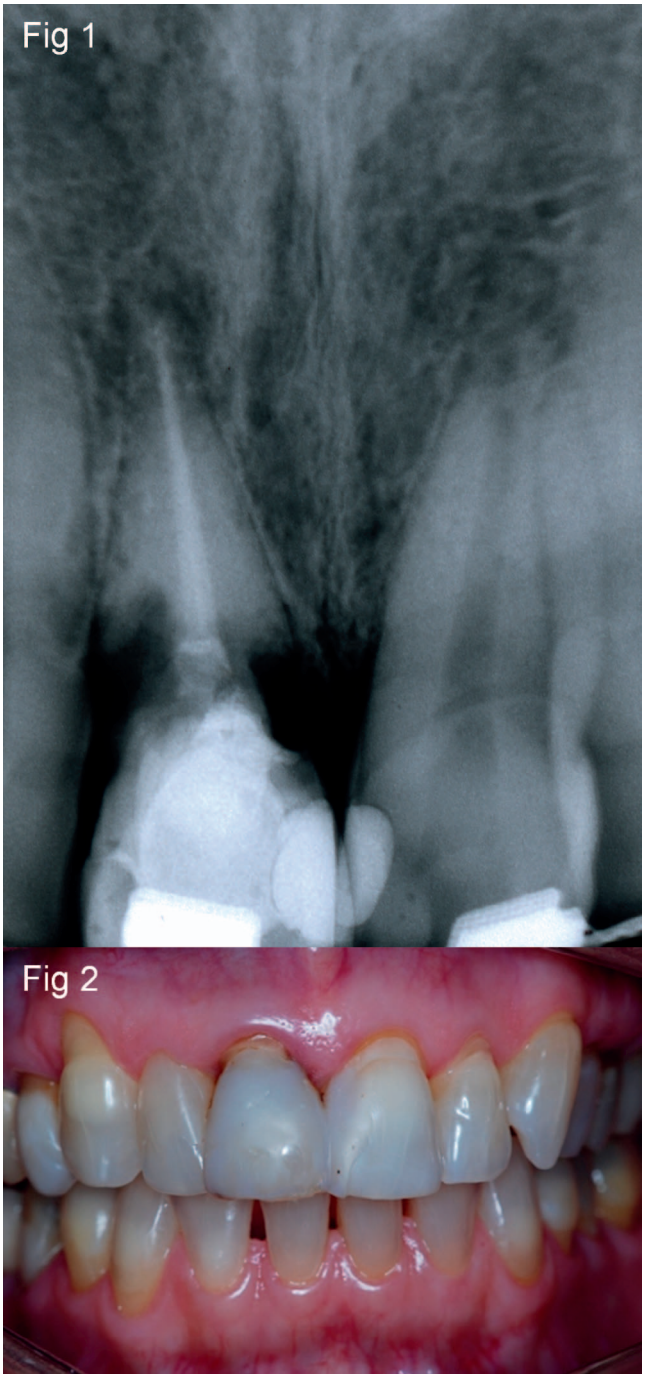

Figure 1. *Initial periapical radiograph.*
Figure 2. *Initial clinical aspect.*

gingival recontouring would be required in tooth #9 (the maxillary left central incisor). Fixed prosthodontics was discarded by the patient due to the risk of damage to adjacent tooth structures. The gingival smile line and maintenance of the existing harmony were considered compromising factors.

A multidisciplinary approach to the case allowed us to offer the patient an alternative treatment. The patient was aware of the risk of possible failure and, consequently, of the need to return to one of the options initially considered in case of failure. Professionals from the fields of orthodontics, periodontics, and restorative dentistry were involved. The procedures are described below in chronological order.

Tooth Traction/Extrusion

The lesion was located approximately 3 mm below the crestal bone, and tooth extrusion was therefore proposed with the use of orthodontic traction. Using the straight wire technique, 0.022-inch slot brackets (Ormco, BR Amersfoort, The Netherlands) were bonded to the six maxillary anterior teeth. The adjacent central incisor served as anchorage, and a sequence of nickel-titanium (NiTi) and stainless steel wires was used for traction. Within 80 days, an extrusion of 3 mm was achieved (Figure 3). The device was kept passive for 3 months until complete tissue reorganization and periodontal bone healing[2-5] (Figure 4).

Surgical Access

The periodontal access technique was selected, aiming to preserve the alveolar crest and gingival tissue as much as possible. The gingiva was detached, and a small portion of the crestal bone was removed near the cavity, exposing its margins.[5-7]

Restoration of the Resorptive Defect

The cavity was restored trans-surgically. After visual access to the area, the affected portion was excavated and cleaned with periodontal curettes. Moisture control is a challenge in trans-surgical restoration, and based on the literature, a light-cured glass ionomer cement (Vitremer, 3M ESPE, St Paul, MN, USA) was selected and injected into the cavity with a Centrix syringe.[6,8-15] After the initial setting, the finishing process of the glass ionomer cement was performed and the area was then sutured.

To improve esthetics, a direct composite veneer was placed. The use of ceramic restoration was not considered because of the overall condition of the tooth, including a weakened structure and uncertain prognosis. The composite restoration met the patient's esthetic needs at the time and has been maintained since placement.

The patient returned for evaluation and suture removal seven days after the procedure.

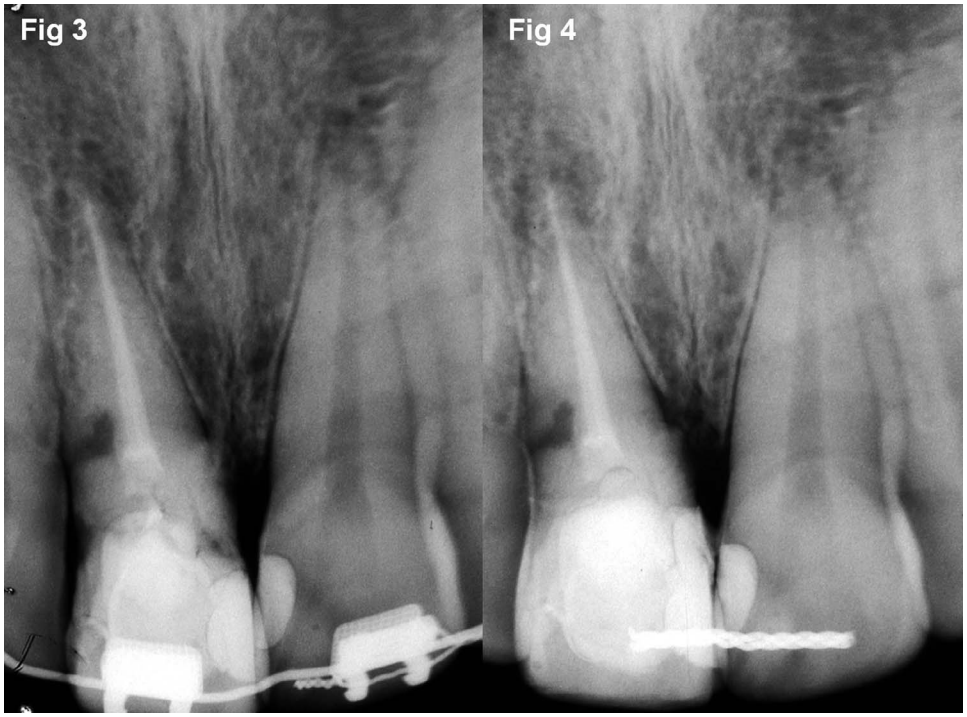

Figure 3. *Orthodontic extrusion and GIC restoration.*
Figure 4. *Fixation after extrusion.*

Since then, the patient has been followed radiographically every six months with no evidence of recurrence of resorption thus far (Figures 5 and 6).

POTENTIAL PROBLEMS

During the course of treatment, unpredictable outcomes may occur. Orthodontic tooth extrusion may result in crown-root fracture, as well as in the inability to expose the resorbed area. The necessary exposure may result in excessive bone removal during surgical access, compromising the final esthetic result. In addition, the filling of the cavity may be incomplete and fail to prevent disease progression.[16]

A prefabricated post was placed eight months after the defect was sealed. Although it does not reinforce the structure, it could possibly increase retention. The authors understand that the post placed was short, and could be longer, but not wider, to enhance retention without transferring stresses to the weakened walls which were reinforced by glass ionomer cement as a dentin replacement.

ADVANTAGES AND DISADVANTAGES

Maintenance of tooth structure, along with its psychological aspect, and stabilization of bone height can be considered the main advantages of the presented technique. Furthermore, there was no impairment of the already established esthetics, which could occur in case of tooth extraction, the healing process, and implant placement.

The main concern is the unpredictable longitudinal behavior and therefore inability to ensure the longevity of the procedure to the patient. The technique may appear to be more complex than implant placement, but when performed by trained professionals, the success rate can be improved. Additionally, at the time this case was treated, the knowledge of dental implants was not as developed as it is today.

Regulatory Statement

This study was conducted in accordance with all the provisions of the local human subjects oversight committee guidelines and policies of the Lutheran University of Brazil.

Conflict of Interest

The authors of this manuscript certify that they have no proprietary, financial, or other personal interest of any nature or kind in any product, service, and/or company that is presented in this article.

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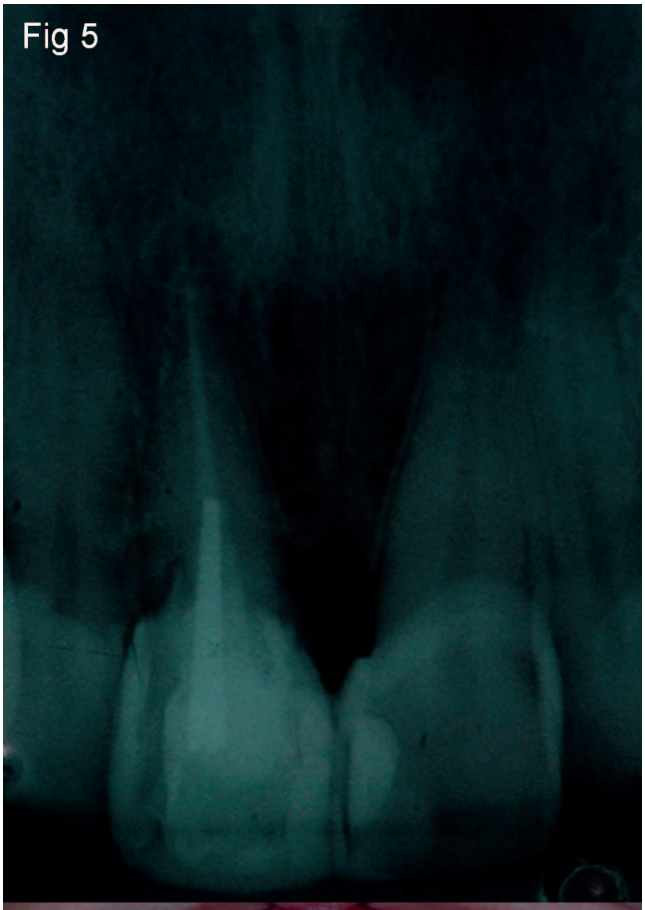

Figure 5. *Fifteen-year follow-up radiograph.*
Figure 6. *Fifteen-year follow-up clinical aspect, after esthetic direct resin veneer.*

REFERENCES

1. Gaviria L, Salcido JP, Guda T, & Ong JL (2014) Current trends in dental implants *Journal of the Korean Association of Oral and Maxillofacial Surgeon* **40(2)** 50-60.
2. Simon JH (1984) Root extrusion rationale and techniques *Dental Clinics of North America* **28(4)** 909-921.
3. Bence L, Singer A, & Young R (2002) Multidisciplinary approach to esthetically challenging rehabilitation: case report *Quintessence International* **33(2)** 100-108.
4. Smidt A, Lachish-Tandlich M, & Venezi E (2005) Orthodontic extrusion of an extensively broken down anterior tooth: A clinical report *Quintessence International* **36(2)** 89-95.
5. Dias C, Closs L, Barletta F, Reston E, Tovo MF, & Lambert P (2015) Root resorption: A 6-year follow-up case report *Operative Dentistry* **31(9)** 103-105.
6. Kqiku L, Ebeleseder KA, & Glockner K (2012) Treatment of invasive cervical resorption with sandwich technique using mineral trioxide aggregate: A case report *Operative Dentistry* **37(1)** 98-106.
7. Kumar SS, Kumar NS, Karunakaran JV, & Nagendran S (2015) Management of invasive cervical resorption in a maxillary central incisor *Journal of Pharmacy & Bioallied Sciences* **7(2)** S712-S717.
8. Mitra SB (1991) Adhesion to dentin and physical properties of a light-cured glass ionomer liner/base *Journal of Dental Research* **70(1)** 72-74.
9. Peltola M, Salo T, & Oikarinen K (1992) Toxic effects of various retrograde root filling materials on gingival fibroblasts and rat sarcoma cells *Endodontics & Dental Traumatology* **8(3)** 120-124.
10. Chong BS, Owadally ID, Pitt Ford TR, & Wilson RF (1994) Cytotoxicity of potential retrograde root-filling materials *Endodontics & Dental Traumatology* **10(3)** 129-133.
11. Brentegani LG, Bombonato KF, & Carvalho TL (1997) Histological evaluation of the biocompatibility of a glass ionomer cement in rat alveolus *Biomaterials* **18(2)** 137-140.
12. Tassery H, Remusat M, Koubi G, & Pertot WJ (1997) Comparison of the intraosseous biocompatibility of Vitremer and Super EBA by implantation into the mandible of rabbits *Oral Surgery Oral Medicine Oral Pathology Oral Radiology Endodontics* **83(5)** 602-608.
13. Gomes SC, Miranda LA, Soares I, & Oppermann RV (2005) Clinical and histologic evaluation of the periodontal response to restorative procedures in the dog *International Journal of Periodontics and Restorative Dentistry* **25(1)** 39-47.
14. Martins TM, Bosco AF, Nóbrega FJ, Nagata MJ, Garcia VG, & Fucini SE (2007) Periodontal tissue response to coverage of root cavities restored with resin materials: A histomorphometric study in dog *Journal of Periodontology* **78(6)** 1075-1082.
15. Ahmed N, Gopalakrishnan, Mony B, & Parthasarthy H (2014) External cervical resorption case report and a brief review of literature *Journal of Natural Science, Biology, and Medicine* **5(1)** 210-214.
16. Kim Y, Lee CY, Kim E, & Roh BD (2012) Invasive cervical resorption: Treatment challenge *Restorative Dentistry & Endodontics* **37(4)** 228-231.