

ANTEROSUPERIOR DENTAL FRACTURE: MINIMALLY INVASIVE ESTHETIC RESOLUTION THROUGH FRAGMENT BONDING - CASE REPORT

Victoria Triers Santos¹

Felipe Antônio Buareto da Silva²

Melissa Bessa Amaral³

Rafaella Gonzaga Santos⁴

Thamires Moreira Oliveira⁵

Ana Lúcia Machado Maciel⁶

Evangelical University of Goiás – UniEVANGÉLICA¹⁻⁶

ABSTRACT

One of the most common and frequent traumatic dental injuries is crown fractures, especially in children and adolescents. Aesthetic and functional rehabilitation is always a challenge for the dental surgeon. When the fragment is intact or with little loss of structure, bonding with the adhesive technique is the preferred minimally invasive conservative option. **Objective:** To report a clinical case of tooth fragment reattachment using the adhesive technique in a patient who presented with a fractured maxillary anterior tooth, with the fragment still present. **Clinical case report:** Patient ARCCA, male, sought emergency care at the UNIEVANGÉLICA Dental Clinic, accompanied by his mother, as he was a minor. The mother reported that her son "fell on the floor and broke his front tooth; I found the piece and put it in a cup with saline solution." On intraoral examination, an oblique fracture of the distal angle of tooth 21 was observed. The remaining tooth and the fragment were evaluated and found to be in perfect condition. After radiographic and sensitivity testing, fragment reattachment using only an adhesive system was indicated, as the fragment was perfectly adapted to the remaining tooth. A follow-up was performed after one week, and no changes in color or sensitivity were detected. **Conclusions:** Tooth fragment reattachment using the adhesive technique demonstrated excellent results in rapidly and effectively restoring both aesthetics and function.

Keywords: Dental bonding; Dental aesthetics; Dental adhesives.

INTRODUCTION

Coronal fractures are very common occurrences in dentistry, affecting especially children and adolescents. The most affected teeth are the upper incisors, due to their anterior location in the oral cavity (VILARINHO, 2020; FARIAS, 2021; KANG, 2021; SANTOS, 2021; FREITAS, 2024). The loss of tooth structure can occur for physical reasons, such as falls, accidents, violence, sports, among others (FREITAS, 2024). In addition to aesthetic and functional damage, it can negatively affect the individual's self-esteem and quality of life (VILARINHO, 2020; FARIAS, 2021; SANTOS, 2021; KANG, 2021; FREITAS., 2024).

In cases of dental trauma, a thorough clinical and radiographic evaluation is necessary to observe the amount of tooth structure lost, the condition of the pulp, periodontal status, soft tissue involvement, time since the fracture, and whether the fragment is available and in favorable for reattachment to the remaining tooth (VILARINHO, 2020).

To restore the aesthetics and function of a fractured tooth, the treatment decision involves various procedures, ranging from fragment bonding, direct restoration with composite resin, or a fixed prosthesis, depending on the clinical assessment (FREITAS, 2024).

Fragment reattachment is a minimally invasive technique (VILARINHO, 2020), as it preserves the original anatomical shape, color, and texture of the tooth, which is important for promoting a positive and immediate psychological response in the patient. It is simple to perform and requires little clinical time. This technique consists of readapting the fragment to the remaining tooth and securing it with adhesive materials (FARIAS, 2021; SANTOS, 2021; KANG, 2021; FREITAS, 2024).

This approach has been made possible by continuous advances in adhesive restorative materials, which allow for fragment stability and natural esthetic outcomes within a short clinical time (FARIAS, 2021).

CASE REPORT

Patient ARCCA, male, a minor who was accompanied by his mother, sought emergency care at the UniEVANGÉLICA Dental Clinic. The mother reported that her son “fell on the floor and broke his front tooth; I found the piece and placed it in a cup with saline solution.” She added that “her son had already fractured the adjacent tooth, but the fragment could not be found, and a restoration was performed.”

On intraoral examination, an oblique fracture of the distal angle of tooth 21 was observed, with no pulp involvement. The periodontium and mucosa appeared intact. Radiographic examination revealed no periodontal or periapical changes, and the pulp sensitivity test was positive, confirming pulp vitality. A preliminary trial placement of the fragment on the remaining tooth structure demonstrated a perfect fit.

Tooth 11, which had previously been fractured and restored after endodontic treatment, showed a small fracture of the composite resin restoration, possibly caused by the current trauma. Furthermore, the existing restoration left tooth 11 with a slightly larger clinical crown in the cervico-incisal dimension compared to tooth 21.

After completing the examinations, since the fragment was in favorable condition for reattachment, the fragment reattachment technique was chosen, a conservative procedure that provides excellent esthetic and functional results.

The clinical protocol for tooth fragment bonding was followed. Infiltrative anesthesia was performed and absolute isolation of the surgical field was achieved, leaving the field dry and ready for the procedure.

Infiltration anesthesia was administered, and absolute isolation of the operative field was achieved, ensuring a dry and controlled environment for the procedure. A thin layer of calcium hydroxide cement was applied to the dentin of the remaining tooth structure, followed by a layer of light-curing glass ionomer cement (Vitrebond™, 3M/ESPE), which was then polymerized. Thirty-seven percent phosphoric acid was applied to both the tooth remnant (after protecting adjacent teeth with a polyester strip) and the fragment, for 30 seconds on enamel and 15 seconds on dentin. The acid was thoroughly rinsed off, and both surfaces were gently dried with absorbent paper. A two-step etch-and-rinse adhesive system (Single Bond, 3M ESPE®) was applied according to the manufacturer's instructions, using a microbrush over the entire conditioned area. The solvent was gently evaporated with air, and a second layer was applied. The fragment was repositioned onto the tooth remnant and light-cured for 40 seconds. No composite resin was required, as perfect adaptation between the fragment and the remaining tooth structure was achieved. After reattachment, the absolute isolation was removed and occlusal adjustments were performed. The fragment showed excellent color match with the tooth remnant, resulting in a natural appearance.

At the one-week follow-up, pulp sensitivity testing remained positive. Minor repair of the resin on tooth 21 was carried out, and the incisal edge was adjusted, leaving both incisors with the same clinical cervical-incisal height.

CONCLUSIONS

The fragment reattachment technique proved to be a highly satisfactory approach, restoring the patient's dental form, function, and esthetics rapidly and effectively.

This technique offers several advantages, including a conservative approach, excellent cost-effectiveness, shorter clinical time, and the ability to preserve the natural anatomical, chromatic, and textural characteristics of teeth affected by coronal fractures when the fragment is available.

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