CONSERVATIVE TREATMENT OF DENTAL TRAUMA: CASE PRESENTATION-DIRECT ADHESIVE RESTORATION TECHNIQUES OF THE 4 UPPER INCISORS WITH DIFFERENT TYPES OF FRACTURES ON THE CORONAL LEVEL

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CONSERVATIVE TREATMENT OF DENTAL TRAUMA: CASE PRESENTATION-DIRECT ADHESIVE RESTORATION TECHNIQUES OF THE 4 UPPER INCISORS WITH DIFFERENT TYPES OF FRACTURES ON THE CORONAL LEVEL (Abstract): Dental trauma creates serious functional, aesthetic and psychological problems for the patient. The known developments in recent years in the area of materials and techniques related to direct composite resin restorations provide for the dentists direct conservative solutions that allow both morphology and aesthetic restoration and preservation of pulp vitality in many of the clinical situations encountered. A careful clinical examination and an accurate diagnosis (in terms of classification of the trauma) will allow the dentist to choose the most conservative therapeutic solution. We recommend the use of the diagnostic and therapeutic guidelines mentioned in the article. Keywords: DENTAL TRAUMA, CORONAL FRACTURE, DIRECTS COMPOSITE RESIN, CORONAL RECONSTRUCTION, and AESTHETICS.

Dental trauma is a fairly frequent condition among school age children and youth. Clinical studies have shown the most common causes of injuries are accidents during playing or sport events and rarely aggression. Moreover, dental traumas create functional, aesthetic and psychological problems for the patients. In these cases the challenge is doubled for the dentist who must restore the affected teeth both on functionally and esthetically. This requires a good understanding of direct restorative techniques including knowledge of color, form, adhesive protocol and laminating techniques.

The progress in recent years in the field of materials and techniques related to direct composite resin restorations provides advantageous solutions for the practitioner versus the indirect restorative therapy used before.

The advantages and disadvantages of dental restorations are as follows:
Direct composite resin restorations: *advantages:* available to any dentist, provides a conservative therapeutic approach, great aesthetic results, very good periodontal tolerance, easy to repair, affordable price; *disadvantages:* the technique is sensitive to any small errors and requires the dentist to have some experience, does not provide good results in case of intense tooth discoloration.

Indirect restorations with ceramic veneers: *advantages:* sufficiently conservative approach, great aesthetic results, great periodontal tolerance; *disadvantages:* minimum two sessions, greater "sacrifice" of tooth substance than with direct methods, several sources for error in technical and clinical stages (preparation, imprinting, and collage), difficult to repair, higher price.

Direct-indirect restorations with composite resins: *advantages:* conservative approach, great aesthetic results, very good periodontal tolerance, better polymerization, easy to repair, affordable price; *disadvantages:* requires technical skills, extended working time, instruments and additional equipment required (specific to dental laboratory).

The types of dental trauma that we can meet are extremely varied: bruises, subluxations, extrusions, lateral luxation, intrusions, avulsion, fractures of the enamel, dentin and enamel fractures, and fractures with coronal pulp chamber opening, crown-root fractures with or without affecting the pulp, root fractures, alveolar fractures.

Recently, a new classification of these injuries was published along with a therapeutic guide for every clinical situation. More information is available on the website of the International Association of Dental Traumatology (IADT):

www.dentaltraumaguide.org

**CASE REPORT**

A 16 years old male who had a skateboard accident resulting in multiple trauma of the upper incisor group.

Clinical examination revealed the following types of injuries: 1.2 - limited oblique fracture of the enamel at the level of mesio-incisal angle; 1.1 - horizontal fracture at the mesial half of the crown, restricted to the enamel; 2.1 horizontal crown fracture of the enamel and dentin; 2.2 crown and root fracture with pulp chamber opening. (fig. 1, 2).

![Fig. 1. Front view of the upper traumatized incisors group.](image1.jpg)

![Fig. 2. Pulp exposed 2.2](image2.jpg)

In accordance with the recommendations of IADT, the treatment plan included three steps: step 1 – emergency treatment; step 2 – rehabilitation treatment; step 3 - clinical and radiological control at 6 months and 1 year for assessment of the
vitality of teeth 1.2, 1.1, 2.1.

During step 1, the treatment included: protection of fracture zones of teeth 1.2, 1.1, 2.1 using composite flow; performing endodontic treatment on tooth 2.2. Due to the destruction of the crown with great loss of tooth substance, this tooth requires the use of a pivot root during the crown restoration stage. Therefore, pulp ablation was performed in this stage, although the literature and treatment guidelines recommend only pulpotomy (fig. 3, 4); contention tray was made for the patient to wear 7-10 days until the relief of the acute symptoms (fig. 5).

![Fig. 3. Checkup of the endo treatment 2.2](image)

![Fig. 4. The clinical aspect after endodontic treatment of tooth 2.2 and sealing the fracture zones in teeth 1.1 and 2.1 with composite flow.](image)

Fortunately, the patient had just completed orthodontic treatment and the orthodontic department was able to provide us with the case study and cast models that have been used to make both the contention tray and the silicon guide during the second restorative stage (fig. 6, 7).

![Fig. 5, 6. Mouth guards. Study models.](image)

![Fig. 7. Checking the correct positioning of the silicon guide.](image)

Anti-inflammatory and analgesic medication was prescribed.

Second stage of treatment started 10 days later. All four incisors were restored. According to the IADT guidelines our treatment plan included: a silicon guide to
achieve the same shape and size of the incisors. (In order to make this silicon guide we used the casts from the orthodontic department); direct composite resin restorations to the teeth 1.2, 1.1, 2.1 presenting fractures of the enamel and enamel plus dentin areas. Mouth guards protected the teeth during the acute inflammatory period.

The restoration phase involved the specific stages of the adhesive technique:
1. dental surface preparation for collage (beveling the margins, Arkansas Type stones finishing, professional brushing);
2. adhesive stage- IV generation adhesive was used, in three steps: etching - primer adhesive;
3. direct composite resin stratification according to aesthetic principles using composite for each type of restored tissue: dentin, enamel, translucent (fig. 8, 9);
4. finishing and polishing

A fiberglass root pivot was used for tooth 2.2 and the tooth crown was restored by direct stratification technique. The loss of substance in tooth 2.2 was at the gingival margin on the palatal side. This required an additional intervention using the electro cautery to highlight the extent of the fracture and achieve appropriate restoration at this level. 1.1, 2.1 were also restored using composite (fig. 10, 11, 12). Check-ups at one and two and a half years later showed satisfactory aesthetical and functional outcomes (fig. 13, 14).

Fig. 8. Palatal wall view - translucent type composite.

Fig. 9. Intermediate phase during the restoration of tooth 1.1

Fig. 10., 11. Buccal and palatal view at the end of the restoration

Fig. 12. Final appearance after completing the restoration of all four upper incisors.
Conservative treatment of dental trauma: case presentation-direct adhesive restoration techniques

Fig. 13. Clinical aspect 14 months later.

Fig. 14. Follow-up 30 months later.

CONCLUSIONS

Regarding our case and the existing theoretical support, for most dental trauma, current conservative therapeutic solutions allow rapid recovery of the patient and satisfactory aesthetical and functional outcomes.

A careful clinical examination and accurate diagnosis (in terms of trauma classification) allow the clinician to choose the most conservative therapeutic solution. We recommend the use of guidelines for diagnosis and therapy listed above.

The practical application reported in this study confirms the previous studies related to restorative treatment of dental trauma through direct restorative technique. Furthermore, our results showed that implementation of this method for restorative treatments solve the aesthetic and functional problems of a trauma especially in case of the frontal teeth.

Improvement in the quality of materials used for direct restorations and their associated techniques create conditions for the clinician to act quickly and effectively avoiding the indirect restorative solutions (prosthetic), which are more expensive and require longer time.

The study can be a useful tool for researchers and practitioners keen to apply this technique in patients with dental trauma.

REFERENCES

1. International Association of Dental Traumatology. www.dentaltraumaguide.org site visited 05.04.2013