SIMULTANEOUS AESTHETICAL RESTORATION OF CENTRAL FRACTURED INCISORS

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INTRODUCTION

The crown fractures of the superior incisors are very often the outcome of childhood and adolescence injuries; aesthetically, they represent a shape and size disharmony at the dental and dento-labial composition.¹-³ Teenagers’ concerns, after such an accident, are focused on hiding this disability, reason for which their smile design is usually altered.⁴

Aesthetical restoration of smile, after young teeth fractures, has to take into account teeth vitality preservation (when this was not compromised) and, if possible, minor sacrifice of hard dental substance; that’s why, the first therapeutic option has to be direct restoration with composite resin.⁵

Aesthetical dental parameters that need to be taken into consideration are: position, shape, texture and tooth color.⁶ One of the most frequently used direct method for this kind of fractured teeth is that using a celluloid crown form. Unfortunately, this technique presents the disadvantage of not allowing an adequate chromatic reproduction of the prospective restoration, this meaning a correct positioning of shades (hues, chromes, values and characterizations); the main cause for this inconvenience is that, right in the moment of conforming matrix application on the tooth, the composite resin layers (judiciously laid inside the cup) aleatory mix between themselves.

In order to rectify this disadvantage, we have resorted to a simple solution: after the matrix cervical

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ABSTRACT

Introduction: From an aesthetic point of view, the crown fracture situated at the superior incisors, represents a shape disability, regarding dental composition. The treatment indication is generated by the patients’ age, the lack of hard dental substance, occlusion and chromatic particularities of teeth. Case report: The patient (15 years old) presented two oblique fractures, II° Ellis Class of 1.1. and 2.1. The aesthetic restoration was performed using an original direct technique; it consisted of the simultaneous restoration of the two incisors using two celluloid crown forms. Their vestibular surfaces were fenestrated in such a way as to preserve the oral and proximal surface form as well as the incisor margin and angle form. Conclusions: This method allows morphological and chromatic simultaneous restoration of teeth. This therapeutic solution is especially useful for young teeth with an extensive chromatic map where the main concern, besides the aesthetic rehabilitation, is to conserve tooth vitality.

Key Words: direct restorations, esthetical restorations, fractured teeth
outline adjustment, in agreement with the gingival
and the insertion of the tooth, a fenestration is
performed, by means of scalpel blade tips, at the
level of the vestibular wall. This vestibular matrix
dental restoration can managed material stratification
very well, so that, a simultaneous chromatic
individualization and crown morphology (primary,
secondary and tertiary) result.

MATERIAL AND METHOD

A 15-year old female patient presented at the
dental surgery ward with an aesthetic disability, caused
by two crown oblique fractures (Ellis II and class), in the
two central superior incisors.

The therapeutic objective was to improve aesthetic
appearance and teeth anterior guidance functional
restoration, using a restoring solution as conservative
as possible.

The clinical examination yielded the initial
diagnosis of crown fractures without pulp implication;
moreover, the left incisors exhibited a disto-vestibulary
dyschromia, brought on by affected dentine.

Aesthetical examination emphasized the following
aspects:

- Patient's altered smile; (Fig 1)
- Oblique fractures affecting both incisal angles of
  the two incisors; (Fig. 2)
- A distal dyschromia localized in the middle third
  of the vestibular face of the left central incisor (caused
  by the coexistence of a carious process);
- Different position of lateral incisors to the central
  ones: 1.2. in palato-position, and 2.2. in vestibulo-
  position; (Fig. 3)
- The lack of interdental contact at the median line
  between central incisors crown abutment; (Fig. 3)
- Apparent face shape of lateral incisors (frontal
  view) is rectangular, and the remaining crown areas
  of the two fractured central incisors suggest their
  integration in the same geometry; (Fig. 3)
- The secondary morphology is characterized by
  growth mamelons; (Fig. 3)
- Teeth basic color, established by means of classic
  method (Vita shade guide) is A1; (Fig. 4)
- The individual chromatic characteristics are mostly
  noticed at the lateral incisors: strongly marked
  translucence in incisal third, interrupted by tiny white
  chalky stains, with irregular outline. (Fig. 2,3)

Treatment chronology:

- Professional teeth brushing;
- Affected dentine exeresis at the left central incisor
  level (2.1.), in order to remove brown pigmentation
  from vestibular surface area and to facilitate chromatic
  analysis; (Fig 4)
  - Setting up of surgical site (with rubber-dam and
    saliva ejector);
  - Adhesive substratum preparation: enamel beveling,
    etching and amelo-dentinal adhesive application. In
    order to obtain similar optical effects in both teeth,
    the preparations were done with an irregular outline
    and, approximately at the same distance to vestibular
    marginal paradontium; (Fig. 5)
  - Celluloid crown forms application, previously
    tried on and fenestrated at the level of the remaining
    abutments; (Fig 6)
  - Vestibular wall fenestration of matrix in such a
    manner as to preserve lateral walls and incisal angles
    form, so as to accomplish the morphological support
    for restorations; (Fig. 7)
  - Composite resin stratification, according to the
    following shades: A1E (enamel shade), applied on
    the cups palatinal wall, followed by A1D (dentine
    shade), that rendered dentinal mamelons, and finally,
    TG (translucent grey shade), applied incisally and
    proximally; (Fig 8-10)
  - Final aspect examination of restorations from
    frontal and incisal incidence, after conforming matrix
    removal, but before finishing; (Fig. 11,12)

The following materials were used for carrying out
the clinical case:

- Dentomin natur. Product (Geoproduct KFT
  MÁD Szabadság), professional teeth brushing paste;
  Shade guide - VitaPan Classical (Vident);
  Rubber Dam /Kofferdam (SDI DIRECTA,
  Svenska Dental Instrument AB);
  Diamond flame burs;
  35% phosphoric acid etching gel  (3M ESPE
  Dental Products St. Paul MN USA);
  Adper Single Bond 2  - adhesive (3M ESPE
  Dental Products St. Paul MN USA);
  Filtek Supreme Universale Restorative, composite
  resin, shades: A1E, A1D and TG (3M ESPE Dental
  Products St. Paul MN USA);
  Elipar FreeLight, curing light (3M ESPE Dental
  Products St. Paul MN USA);
  Celluloid crown forms (Frasaco Franzsachs &
  co. Germany);
  Composite placement instruments (Cosmodent);
  Finishing and Polishing Discs (3M ESPE Dental
  Products St. Paul MN USA);
  Interproximal finishing streps (3M ESPE Dental
Figure 1. Patient's initial smile.

Figure 2. Frontal, retracted initial view: oblique crown fractures II$^{nd}$ class Ellis 1.1. and 2.1.

Figure 3. Frontal superior teeth view, after damaged dentine exeresis at the level 2.2.

Figure 4. Teeth basic color determination.

Figure 5. Circumferential beveling of peripheral enamel at the fracture surfaces level, after an irregular outline.

Figure 6. Celluloid crown forms insertion at the remaining crown abutments.

Figure 7. Windows fenestration at the level of matrix vestibular wall.

Figure 8. Composite resin stratification.

Figure 9. Composite resin stratification.

Figure 10. Composite resin stratification.
DISCUSSIONS

Teeth aesthetical rehabilitation with crown fractures may be performed using more direct techniques: among these, the most frequently used are those realized by means of prefabricated morphological support (celluloid crown forms), or made up of silicone impression material (after a previous “mock up” and “wax up”). The proposed technique – celluloid fenestrated crown forms – is, as a matter of fact, a kind of hybrid between the two, which confers the morphological support necessary for the composite material oro-vestibular stratification, without a previous „mock up” or „wax up” (that prolongs working time).

CONCLUSIONS

Any kind of restoration regarding central superior incisors – the dominant element of dental composition – should be preceded by a rigorous aesthetical analysis, regarding both geometric and chromatic particularities of teeth.

The direct techniques of aesthetical restoration represent the best choice for teenagers, as a minor loss of hard dental substance is required.

Although, the option, for one or other direct restoration method for young fractured teeth, rests with the dentist, he has to take into account aesthetical and functional objectives, but also the necessity to limit working time.

REFERENCES