

Immediate restoration of a complete crown fracture in a central incisor

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The patient, a 30-year-old male, presented to our office as an emergency case after losing his upper left central incisor (Fig. 1). His usual dentist was closed for summer vacation and therefore he came to our office without an appointment to ask for help.

Upon the initial examination, it was visibly noticeable that the patient was not accustomed to visiting his dental office for regular cleanings. Plaque, calculus, severe gingivitis and a few caries lesions were easily visible during the visual examination (Fig. 2).

It is evident that the fracture was caused as a result of the caries. The tooth underwent a root canal some years earlier; however, the restoration is now deeply infiltrated by caries. From a palatal view, a class III cavity was also visible on the mesial side of tooth 11 (Fig. 3).

The crown was completely infiltrated by caries and is thus no longer useful (Fig. 4).

Despite this, there was actually a way to use the old crown. The crown could be put back into place using some flowable composite, which could be used to create a “homemade” mock-up of a temporary crown (Fig. 5).

As the patient came in on an emergency basis, a fast and reliable solution was needed. Due to the esthetic impact of the central incisor, it was not possible to postpone the patient's treatment to another visit.

Precision and stability were needed in order to create a good shape of the temporary crown, as well as to save time for finishing. For this purpose, we used a high precision silicone impression material in two different viscosities (Honigum Pro Light and Honigum Pro Heavy, DMG) (Fig. 6).

Rubber dam isolation is always mandatory when performing endodontic treatments and adhesive procedures.

It is typically standard procedure to clean the mouth of the patient prior to treatment; however, since this was an emergency case, and since there was a risk of difficult-to-control bleeding, we decided to proceed without cleaning the neighboring teeth (Fig. 7).

The caries and old filling material were completely removed. The root canal treatment was subsequently completed (Fig. 8).

The dowel space was prepared, paying special attention to remove only the gutta-percha, without cutting away sound dentin (Fig. 9).

The correct fiber post size was selected and verified (LuxaPost 1.5 mm, DMG).

A universal adhesive (LuxaBond Universal, DMG) was applied to the root canal, preparation area and the fiber post in self-etch and dual-cure mode. The post was then cemented using a dual-cure resin cement (PermaCem Universal, DMG) (Fig. 10).

The core was easily restored using a dual cure material (LuxaCore Z Dual, DMG) with the help of a circumferential matrix (Fig. 11).

The abutment was prepared with a vertical finishing area (Fig. 12).

After completion of the core, the temporary crown was fabricated. As this was an emergency appointment to treat a central incisor of a deep-bite patient, a fast and reliable material was needed with high esthetic and superior mechanical properties in order to reduce the available occlusal space. In addition, the material needed to be durable, as the patient stated that the final crown would be postponed for financial reasons.



Fig. 1: Initial situation



Fig. 2: Extensive caries visible on stump



Fig. 3: Palatal view



Fig. 4: Fractured crown



Fig. 5: Fractured crown used as mock-up to fabricate impression matrix

Based on this, a self-cure material designed for semi-permanent restorations was dispensed (LuxaCrown, DMG) into the prepared impression (Fig. 13). The impression was placed back into the mouth.

After the curing time was complete, the crown was removed from the impression. Intracul-
marginal margins were highlighted with a pencil (Fig. 14).

The concavity between the blue line and the outer margin of the crown was filled with a flowable composite. The crown was finished and polished.

At this moment it was possible to use the ultrasonic scaler to remove some calculus without worrying about bleeding. The semi-permanent crown was cemented (Fig. 15).

Two weeks after the semi-permanent crown cementation (Fig. 16), the gums appear to be healthier. The patient has no pain and is completely satisfied with the solution.

He can now focus on having all caries treated, relying on the semi-permanent crown of tooth 21.

CONCLUSIONS

Cases like this one are always a challenge as they typically come without warning. It is therefore imperative that we are fast and effective from both a functional and an esthetic point of view.

It's important to have reliable techniques and materials on hand when needed. Having simple protocols in place is a great way to avoid mistakes and remain professional when treating patients in emergency cases.

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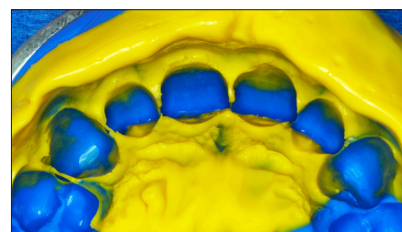


Fig. 6: Honigum Pro impression matrix

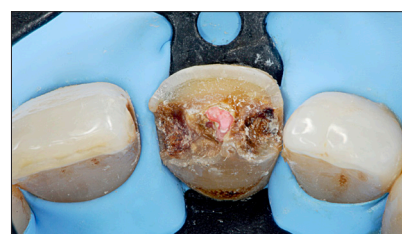


Fig. 7: Palatal view after isolation with rubber dam



Fig. 8: Radiograph after root canal treatment

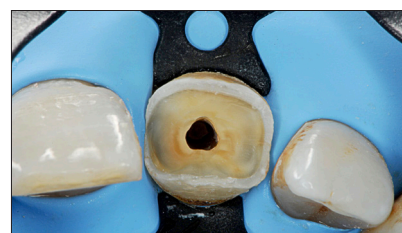


Fig. 9: Root canal after preparation

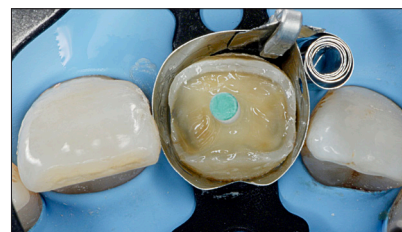


Fig. 10: Luting of LuxaPost

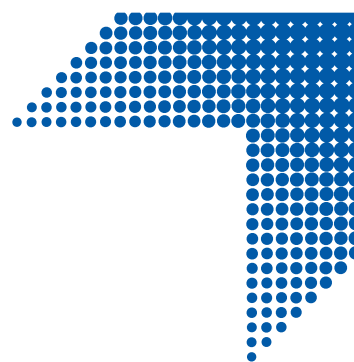


Fig. 11: Core build-up with LuxaCore Z Dual



Fig. 12: Core build-up after preparation



Fig. 13: Dispensing of LuxaCrown into Honigum Pro silicone matrix



Fig. 14: Semi-permanent crown with highlighted margins



Fig. 15: Fitting of the semi-permanent crown



Fig. 16: Final restoration



Fig. 17: Initial situation vs. situation after emergency treatment