Fracture of anterior natural teeth due to trauma can be a very stressful situation in everyday clinical practice. Young patients are sometimes difficult to handle, and require fast and simple treatment solutions.

If possible, fragment reattachment can provide very good long-term results. In case of missing fragment, composite resin restoration should be the first choice due to its minimally invasive nature.

This young female patient presented at my office in an emergency appointment after a bike accident. Both of her upper central incisors were fractured. The fragments were not present, so I decided to schedule the patient for a sufficient appointment for restoration with direct composite resin.
Fig. 1 – Initial situation. The fracture extended in the dentine, but without pulp exposure.
Fig. 2  
Img. 2 – Right lateral view of the initial situation.
Fig. 3  Img. 3 – Left lateral view of the initial situation. Some cracks in enamel are evident. It was discussed with the patient, that she was not concerned about the appearance of these cracks. Also, the incisal translucent areas are obvious on this image. We need to replicate this translucency in our composite restorations.

Fig. 4  Img. 4 – VPS impressions were taken from the patients teeth, and sent to the lab for a wax-up of the original anatomy.
Img. 5 – I made a silicone key, according to the wax up. TIP: Always consider, how many teeth you are going to isolate and cut the index accordingly to ensure perfect repositioning of the silicone index. Remove palatal and distal ends of the silicone index, so that you are able to check the position of it. As there is a slight diastema between the centrals, most likely due to unfinished growth of the patient, the approximal part can be modeled free-hand.
Fig. 6 – The other important region is the incisal area. By cutting the index in the proper place, you are able to obtain the incisal margin configuration from the wax-up. Also, this can avoid excessive enamel thickness in the incisal area and facilitates removal of excess material before polymerisation. I always clean the silicone with alcohol and cotton pellets, and put a thin layer on its surface, polymerize it, to ensure a better adaptation and easy handling of the enamel material.
Fig. 7  
Img. 7 – Rubber dam isolation was done. The sharp edges and unsupported enamel were removed, and a buccal bevel was prepared.
Fig. 8  Img. 8 – Etching with phosphoric acid for 30 sec. Neighbouring teeth can be protected with teflon tape.

Fig. 9  Img. 9 – After rinsing the etchant, the properly etched surface takes a matte appearance. I make sure to clean the area thoroughly, not forgetting the palatal aspect and apply the adhesive afterwards.
Fig. 10 – After application of the palatal enamel shell. Note the proper configuration of the incisal edge, already at this stage.
Img. 11 – Lateral view. The enamel shell is stabilized with a thin layer of flowable composite.

Img. 12 – The dentin layer is applied. This layer should extend almost to the incisal edge, and also should cover most part of the enamel in the bevel area.
Fig. 13

Img. 12 – Placement of dentin layer. You can evaluate the space left for the enamel on this picture.
Img. 13 – After mild characterization of the dentin mamelons, a more translucent enamel layer was applied between the mamelons to imitate the translucent incisal area.

Img. 14 – Then, the restorations were finished with final enamel layer.
Fig. 15 – The restorations after finishing and polishing steps. The appropriate incisal configuration becomes evident at this stage.
Img. 17 – Final restorations after 2 weeks of rehidration.

Img. 18 – Final restorations with diffused light.
Fig. 19

Img. 19 – Right lateral view.
In case of traumatic injuries and fractures of anterior teeth, the best solution is always reattachment of the fragment. In case the fragment is missing, we should apply the less invasive solution, which can ensure a good long-term prognosis. Composite resin restorations are on top of this list.

For a good esthetic integration, reproduction of the correct anatomic shape is essential. Whenever possible, one should do a wax-up and silicone index, and use this at its full potential according to the actual case. This will significantly facilitate shaping and layering the composite restorations.