Immobilization period

The period of splinting is crucial for a good prognosis. Initially, it was believed that the longer the splinting period, the better is the healing. But later it was proved that extending the immobilization period led to increased frequency of root resorption and dento-alveolar ankylosis.3 From the earlier immobilization period of 8 months that was practised in the 1930s, it has now been reduced to a few weeks.31 Keohoe3 recommended 2–3 months of immobilization, while Douglas and Douglas34 suggested 6 weeks of splinting for good healing with little or no complications. Andreasen6 has demonstrated that teeth splinted for shorter periods demonstrated better healing than teeth splinted for four or six weeks. It is thus recommended that the period of fixation following avulsion should be kept to a period of 1–2 weeks to avoid root resorption.44,56. It also requires about one week to obtain a strong gingival attachment that is sufficient to support the tooth in the socket following splinting of an extruded tooth.35,36 Extended splinting periods may be required when there is associated injury to the marginal alveolar bone (up to about 6 weeks),37 or in the case of root fractures where immobilization up to 2–4 months may be required.38

The International Association for Dental Traumatology (IADT)39 guidelines for duration of splinting for traumatic injuries are given in Table 1.

### Table 1. Guidelines for splinting of traumatic injuries as recommended by IADT.

<table>
<thead>
<tr>
<th>Avulsion</th>
<th>Root fracture</th>
<th>Concussion</th>
<th>Subluxation</th>
<th>Extrusion</th>
<th>Lateral luxation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible splint for 2 weeks except when the extra-oral time is &gt;60 minutes.</td>
<td>Stabilize the tooth with a flexible splint for 4 weeks. If the root fracture is near the cervical area of the tooth, stabilization is beneficial for a longer period of time (up to 4 months).</td>
<td>No splinting is needed. Monitor pulpal condition for at least 1 year.</td>
<td>A flexible splint to stabilize the tooth for patient comfort can be used for up to 2 weeks.</td>
<td>Reposition the tooth by gently re-inserting it into the tooth socket. Stabilize the tooth for 2 weeks using a flexible splint.</td>
<td>Reposition the tooth with forceps to disengage it from its bony lock and gently reposition it into its original location. Stabilize the tooth for 4 weeks using a flexible splint.</td>
</tr>
</tbody>
</table>

### Splint removal

Removal of the splint is as important as placement of the splint. Care must be taken not to cause trauma to the teeth and also to remove all the adhesive material from the tooth surface. Inadequate removal of material may favour plaque accumulation and enamel decalcification. However, over zealous removal of the material from the tooth surface can result in a roughened surface. There are different ways to remove a splint,46 such as using hand scalers, ultrasonic scalers, rubber wheels, abrasive discs, high or low speed burs, tungsten carbide burs, etc. Button brackets are routinely removed with debonding pliers and removing composite material is chipped off with a curette or a bur.26 The resin from the wire and resin splint is removed with a high speed bur.26 Fibre splints are removed with a tungsten carbide bur. TTS was found to be the easiest to remove. The composite over the TTS is removed down to the level of the splint and the TTS is ‘peeled’ off from the tooth with a haemosat.31 Final polishing of the teeth can be done with finishing discs.1

Splint removal time varied for each splint. It was found to be very fast and easy to remove a titanium trauma splint (3.7 ± 0.48 min) compared to the wire and composite splint (6.4 ± 2.34 min) or a bracket splint (5.2 ± 1.46 min).26

It has been observed that iatrogenic damage to the enamel is common or unavoidable, regardless of the technique used. Debonding with pliers or hand scalers causes the maximum damage, resulting in chipping of the enamel surface. A better technique would be to reduce the bulk of the resin using finishing burs or discs, although it is difficult to recognize the enamel-resin interface without magnification, making it difficult for the clinician to decide ‘when to stop’.

Softex discs (3M ESPE, St Paul, MN, USA) and tungsten carbide burs were found to produce least damage to the enamel surface.30

### Conclusion

Although there are numerous types of dental splints available to immobilize traumatized teeth, a splint that allows mild physiological movement of the tooth for a minimum period of time, that is easy to place and comfortable to the patient should be the splint of choice. Titanium trauma splints, fibre splints and wire and composite splints fulfill most of these criteria. Titanium trauma splints are not readily available in some countries. Though the choice also depends on the preference of the clinician, these authors prefer fibre splints, as they cause minimum damage to adjacent tissues and are also easy to maintain oral hygiene compared to the wire and composite splints.

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