



## MANAGEMENT OF AN APPREHENSIVE CHILD WITH DENTAL TRAUMA: A CASE REPORT

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### ABSTRACT

Trauma to the maxillary primary anterior dentition is common in a pediatric dental setting. As they are complicated injuries, there is a need to establish priorities for an adequate emergency treatment of these lesions. The management of primary dentition trauma is often different as compared with permanent teeth. An appropriate emergency treatment plan is important for a good prognosis. Ribbond can be used as an alternative to conventional treatment in pediatric dentistry. This case report presents successful management of luxation of deciduous anterior teeth by means of ribbond splinting.

**KEYWORDS:** Ribbond, Flowable composite, Luxation, Semi-rigid splinting.

### INTRODUCTION

From birth, a child is exposed to traumatic episodes, which, depending on the energy of the impact, can result in injuries which may range in severity from minor problems to life-threatening cases. The prevalence of traumatic injuries in the 0–6-year segment varies from 11 to 30% and the most common type of injury seen is the luxation of the anterior teeth. Kenwood and Seow reported that in children < 7 years old, more than 30% have experienced trauma to their primary dentition.<sup>[1,2]</sup> These injuries occur most often to anterior teeth and males predilection is more than females. Accidental falls and trauma are the leading causes of most dental trauma. In addition, as children become involved in sports at a young age, failure to wear a properly fitted mouthguard while engaging in sports activities has become another significant factor in increasing the risk of dental trauma. Patients can present with a wide variety of injuries, ranging from damage to the tooth itself, such as crown or root fractures, to injuries to the supporting periodontal structure, including luxations and avulsions. In contrast to injuries of the permanent anterior teeth-where fractures are the most prevalent type of injury-the majority of injuries to the primary anterior dentition are luxations.<sup>[3]</sup>

Oral luxation affects mainly the maxillary central incisors. Horizontal force directed to the labial aspect of the crown displaces it palatally pushing the root apex

labially and away from the developing permanent tooth bud. Detachment of gingival fibers allows invasion of oral microorganisms along the root surface and infection of the PDL. In addition, the delicate labial bone plate often fractures concomitant with haemorrhage and swelling of the upper lip.<sup>[3]</sup> Apart from esthetic and hygienic components, demands on tooth fixation techniques also include ease of construction and removal and the use of devices which allow slight movement of the fixed teeth.<sup>[4]</sup> Current evidence supports short-term, non-rigid splints for splinting of luxated teeth.

Ribbond is a spectrum of 215 fibers with a very high molecular weight. First introduced to the market in 1992, Ribbond consists of bondable, reinforced ultra-high-strength polyethylene fibers<sup>[5]</sup> with a high elasticity coefficient (117 GPa) that makes them highly resistant to stretch and distortion and a high resistance to traction (3 GPa)<sup>[6]</sup> that allows them to easily adapt to tooth morphology and dental-arch contours.<sup>[6,7]</sup>

Despite this versatility, there are few reports on the use of Ribbond in pediatric dentistry. The purpose of this paper is to present a conservative treatment of a case of oral luxation of maxillary primary incisors using Ribbond.

**CASE REPORT**

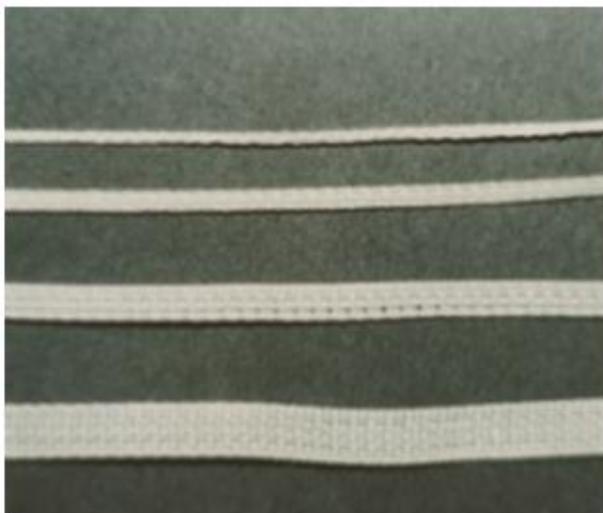
A 2.5 years old boy reported to the Department of Pedodontics and Preventive Dentistry of Kothiwal dental college and research centre, Moradabad, 2 hours after a fall from the stairs resulting in dental trauma. (Figure 1)



**Figure 1: Pre-operative photograph of patient.**

His medical history was uneventful with no known allergies. He did not lose consciousness nor did he vomit following the injury. Extra-oral examination revealed no disturbances in the temporo-mandibular joint. Bruising and swelling of the lips was observed. Intra-oral examination revealed hematoma of the lip, soft tissue lacerations, and fracture of primary maxillary central incisor. Moreover, the child was in pain and could not close his molars into normal occlusion. Patient was very uncooperative so, periapical radiograph could not be taken.

The treatment consisted of repositioning the teeth and bone fragments by finger pressure, with the patient under local anesthesia. The decision was made to splint the teeth from canine to canine for patient comfort using a 2-mm-wide strip of Ribbond. There are different sizes of ribbond available in the market. (Figure 2)



**Figure 2: Different sizes of Ribbond material.**

The labial surfaces of the teeth were etched, rinsed and dried, and Single Bond was applied. To insure semi-rigidity, the interproximal region was not etched or bonded. After applying a flowable composite to the enamel surfaces, the Ribbond was pressed through the composite against the teeth and cured. The Ribbond was then coated with additional flowable composite and cured again for 20 s. (Figure 3)



**Figure 3: Ribbond placement from canine to canine.**

Instructions for strict oral hygiene were given and antibiotics and analgesics were prescribed. Patient was kept on weekly recall. After one week recall, the Ribbond splint at the interproximal area was cut with a diamond bur. Then, the splint was removed from the teeth. The remaining adhesive was removed with a tungsten carbide bur in a lowspeed handpiece under coolant water and the surfaces were polished with disks. The soft tissue had healed and good occlusion was achieved. (Figure 4) The patient was recalled after a month and there was no post-operative complications.



**Figure 4: Post-operative photograph of the patient after one week.**

## DISCUSSION

The case presented in this paper is one of the commonest injuries occurring in primary dentition. Such injuries involve the supporting tissues i.e. periodontal ligament, gingival fibers, and bone, and the vitality of the pulp. Orally luxated incisors cannot return spontaneously to their normal alignment when interference exists between the maxillary and mandibular teeth, and it requires intervention. Ribbond can be used in stabilizing traumatized teeth, restoring fractured teeth and creating a fixed partial denture and for direct-bonded endodontic posts and cores, orthodontic fixed lingual retainers and space maintainers.<sup>[7]</sup>

The time interval elapsed since injury is very important because it influences the choice of treatment. When the child has normal relations between the dental arches (i.e. the incisal edge of the mandibular incisors are in contact with the palatal aspect of the maxillary incisors), oral displacement of the crown will create occlusal interference. Luxation also causes rupture of the gingival fibers and the periodontal ligament (PDL). According to Andreasen *et al.*, repositioning of the dislocated teeth is more difficult after 48 h of the injury. Delayed repositioning may be difficult probably due to a blood clot organized in the socket. After luxation injury, immediate reposition and stabilization of the teeth in their anatomically correct positions are essential to optimize healing of the periodontal ligament and neurovascular supply, while maintaining esthetic and functional integrity.<sup>[3]</sup>

Proper diagnosis, treatment planning and follow up are critical to assure a favourable outcome of traumatic dental injuries. One of the critical phases of the treatment is the splinting or stabilization of the affected teeth. It has been shown that fixation of only one week is enough to achieve the clinical healing of repositioned teeth. Splinting with ribbond and composite resin for stabilization of traumatically displaced teeth is performed in the present case, which has reported to lead to satisfactory results, since it allows for physiologic mobility and easy cleansing. Ribbond is biocompatible, esthetic, translucent, practically colorless and disappears within the composite or acrylic without show-through.<sup>5</sup> Ribbond fibers are also characterized by an impact strength five times higher than that of iron.<sup>[6]</sup>

Ribbond fibers easily absorb water because of the “gas-plasma” treatment to which they are exposed. This treatment reduces the fibers superficial tension, ensuring a good chemical bond to composite materials. The child’s age at the time of injury is an important factor affecting the operator’s decision on the suitable approach. The younger the child, the greater the risk for damages to the succedaneous permanent tooth, and the more severe the defect may be. It has been shown that injuries to primary teeth may affect permanent teeth and cause hypo-calcification even at a later age.

Also, the age of the child determines the level of cooperation that he/she will show. It seems reasonable, however, that a young child seen by a dentist following dental trauma is apprehensive and does not cooperate.

## CONCLUSION

The present cases provide a conservative alternative to extraction for injured primary incisors. Splinting, good oral hygiene, and antibacterial therapy may preserve the injured teeth until natural exfoliation. It is impossible to completely prevent accidents that might result in dental injuries especially in cases of children, but their associated complications can be avoided by adequate treatment and follow-up.

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