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Trauma to Recovery: A Case Report on Lateral Luxation of a Permanent Tooth

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ABSTRACT:

Background: Lateral luxation is a traumatic dental injury characterized by displacement of a tooth in a direction other than its long axis, often associated with damage to the periodontal ligament and alveolar socket. Prompt diagnosis and appropriate management are essential to ensure favourable healing outcomes.

Aim: To present a case of lateral luxation in a permanent tooth and evaluate the clinical outcome following immediate repositioning and splinting.

Summary: A 12-year-old female patient reported to the department with trauma to the anterior maxillary region. Clinical examination revealed lateral displacement of the maxillary central incisor with tenderness. Radiographic findings confirmed lateral luxation without root fracture and an open apex with periapical radiolucency. The tooth was gently repositioned under local anaesthesia and stabilized using a flexible splint for 2–4 weeks, followed by routine post-operative care, endodontic procedure and instructions.

Results: Follow-up at regular intervals showed satisfactory healing with improved tooth stability, normal function, and no signs of pulp necrosis, root resorption, or ankylosis.

Conclusion: Immediate repositioning and appropriate splinting play a crucial role in the successful management of lateral luxation injuries. Regular follow-up is essential to monitor pulpal vitality and prevent long-term complications.

Keywords: Lateral luxation, dental trauma, permanent tooth, splinting, case report

INTRODUCTION:

Due to their prominent position in the dental arch, anterior teeth are most commonly impacted by traumatic dental injuries (TDIs), which are common in children and teenagers. Among them, luxation injuries cause the tooth to move out of its socket and are frequently linked to harm to the neurovascular supply, alveolar bone, and periodontal ligament. A particular kind of luxation injury known as "lateral luxation" is defined

by the tooth moving away from its long axis and is often accompanied by a fracture or compression of the alveolar socket wall.[1]

Although lateral luxation is less common than other traumatic injuries such subluxation or crown fractures, the degree of supporting tissue loss makes it a serious injury. Tooth displacement, immobility from locking within the bone, percussion sensitivity, and occlusal interference are common clinical characteristics. A radiographic examination can help with diagnosis by revealing disruption of the lamina dura or enlargement of the periodontal ligament gap.[2]

Prompt action is necessary for the management of lateral luxation, including careful repositioning of the displaced tooth and fixation with a flexible splint to promote periodontal repair. Early treatment greatly improves prognosis and lowers the risk of sequelae such pulp necrosis, inflammatory root resorption, and ankylosis, according to the International Association of Dental Traumatology (IADT) standards.[1] The degree of displacement, the stage of root development, and the amount of time that has passed before therapy all have a significant impact on the healing outcome.

Different prognosis results after lateral luxation injuries have been documented in earlier research. While older teeth exhibit a higher prevalence of pulp necrosis and may need endodontic intervention, immature teeth often have a better prognosis because of their increased capacity for revascularization.[3] Therefore, long-term follow-up is essential to monitor pulpal status and periodontal healing.

This case report aims to present the clinical management of a laterally luxated permanent tooth and to evaluate the treatment outcome following timely intervention and appropriate splinting.

CASE PRESENTATION

A twelve-year-old girl reported to the Department of Pedodontics and Preventive Dentistry, MGV's KBH Dental College and Hospital, Nashik, Maharashtra, India. She complained of displaced tooth in anterior front tooth region. Patient was apparently alright in the morning when she fell off her bike and displaced her anterior tooth. Patient went to the civil hospital and was referred to the department. There were no signs of head injury, no loss of consciousness, no vomiting. She reported of pain and swelling in that region.

Clinical Findings:

During the intraoral clinical examination, lateral displacement w.r.t 11 was seen.

Laceration in the labial and palatal mucosa in region of 11, 21.

Lacerations in labial and lingual vestibule.

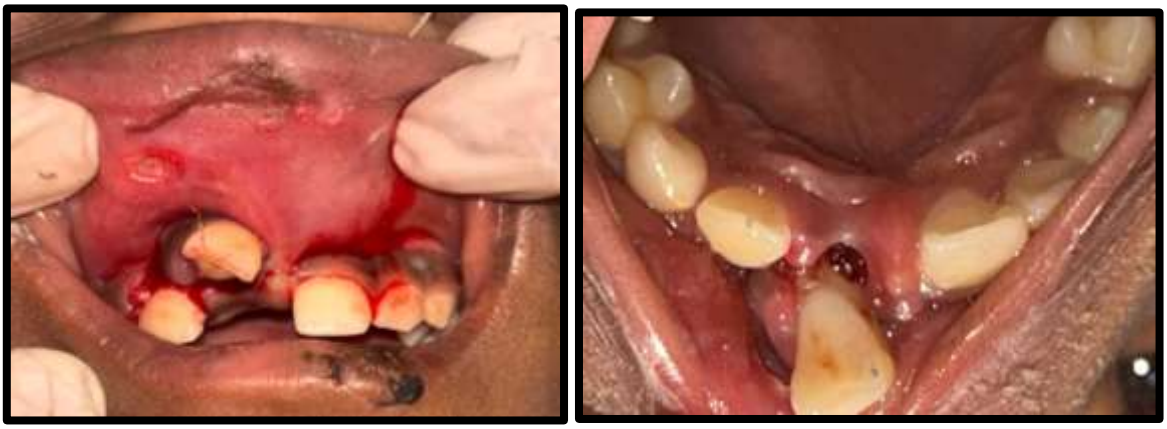

Fig1.Pre operative images

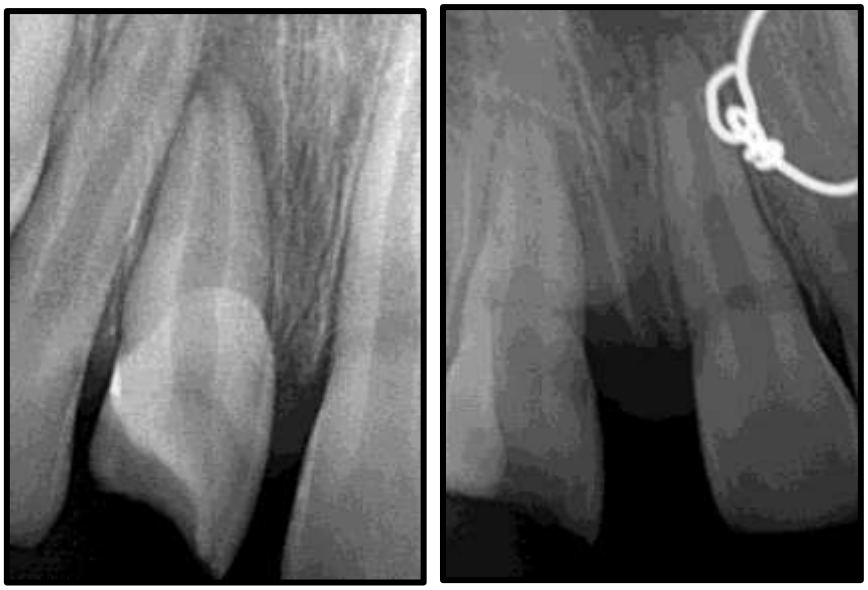

Fig 2. Pre operative X-Ray

TREATMENT PLAN:

1. **Emergency Phase:**

- Extraoral disinfection performed using povidone-iodine solution
- Radiographic evaluation confirmed absence of root or alveolar fracture
- Local anesthesia administered
- Socket irrigated with povidone-iodine and normal saline
- Tooth repositioned using gentle digital pressure
- Proper positioning confirmed radiographically
- Stabilization achieved using a **passive and flexible splint**
- Occlusion relieved by raising bite with GIC on 36 and 46
- Patient scheduled for follow-up after 24 hours

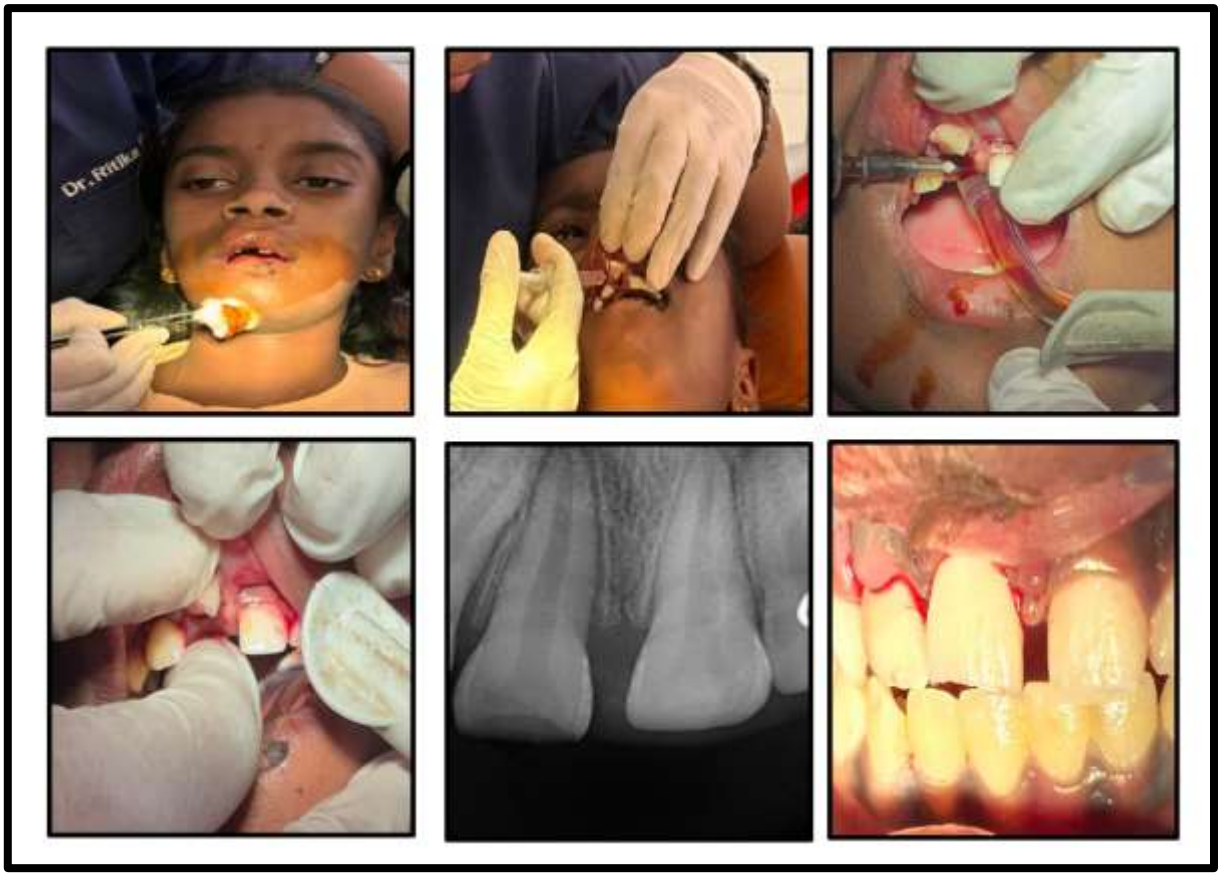

Fig 3. Emergency Management

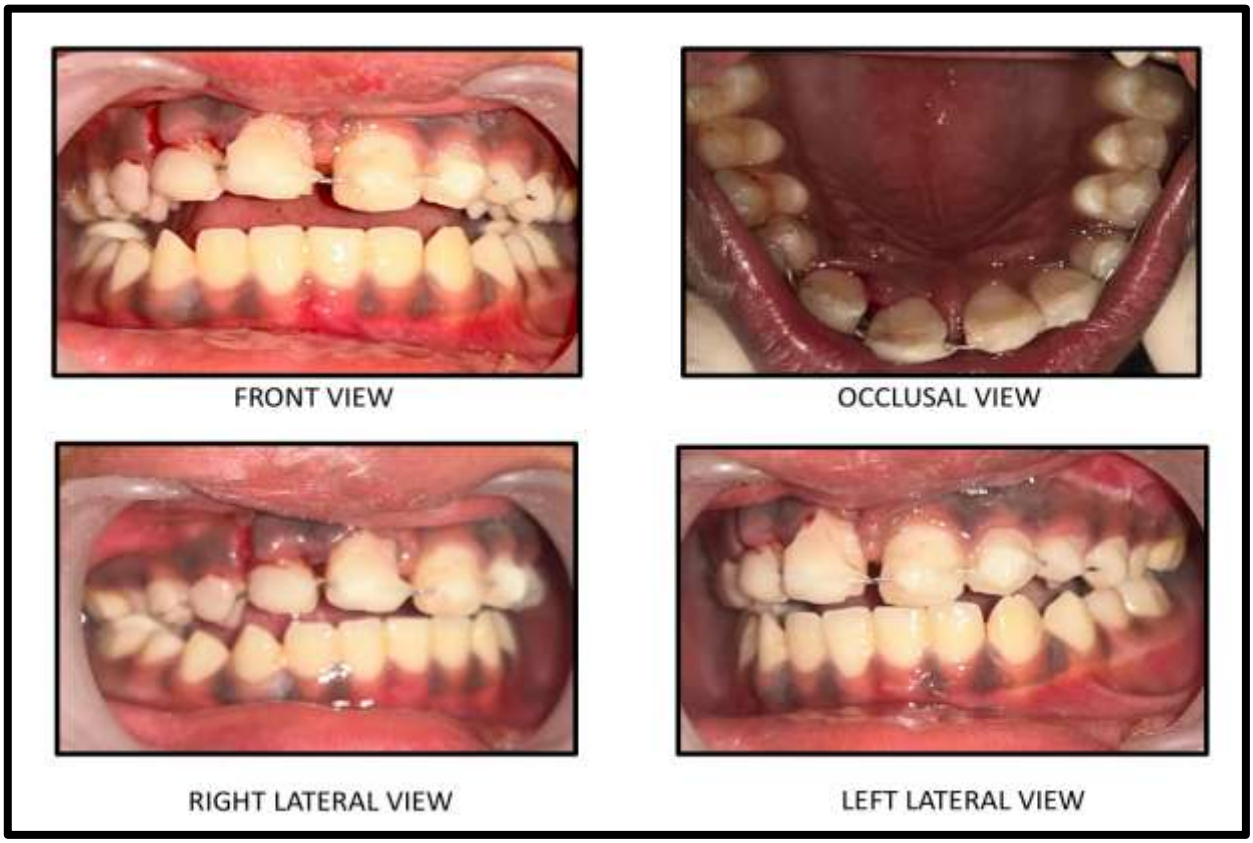

Fig 4. Immediate post-operative images

2. Endodontic Phase:

- After 15 days, Due to Grade I mobility and Periapical Radiolucency w.r.t 11 Root Canal Treatment was initiated.
- Calcium Hydroxide Dressing was placed for 15 days.
- MTA Apexification w.r.t 11

3. Follow-up and Outcomes:

- Repositioned tooth was monitored clinically and radiographically at 2 weeks, 4 weeks. Pt advised follow up at 3 months, 6 months, one year, and yearly thereafter for at least five years.

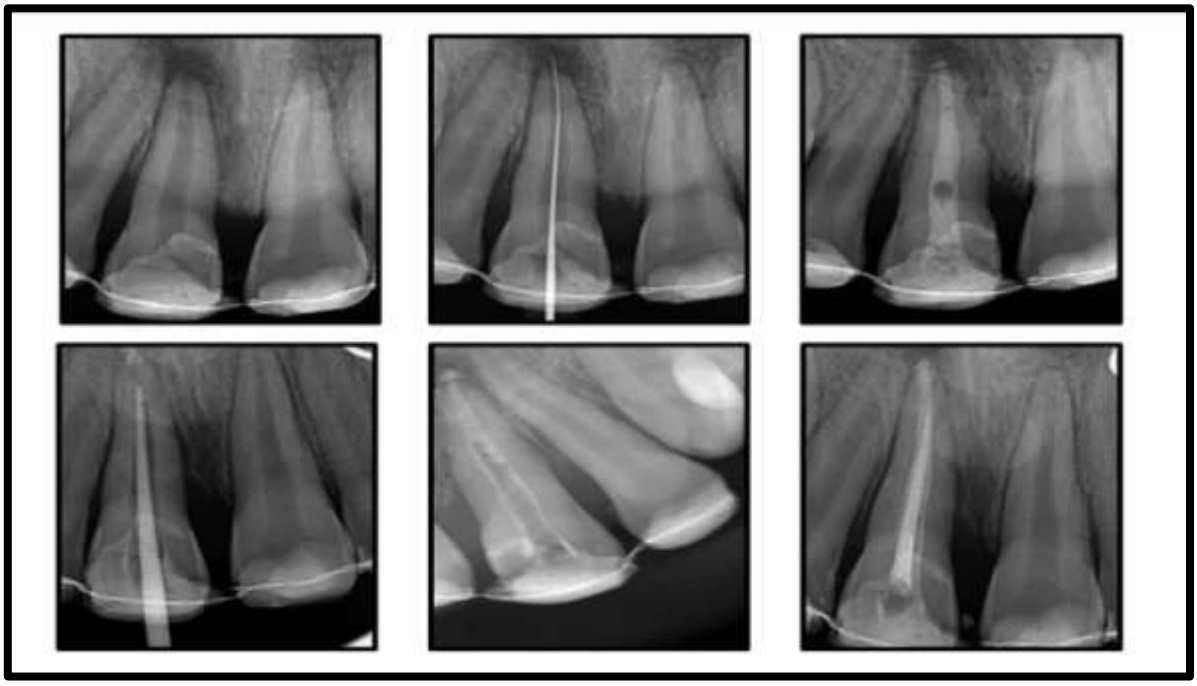

Fig 5. Endodontic Phase

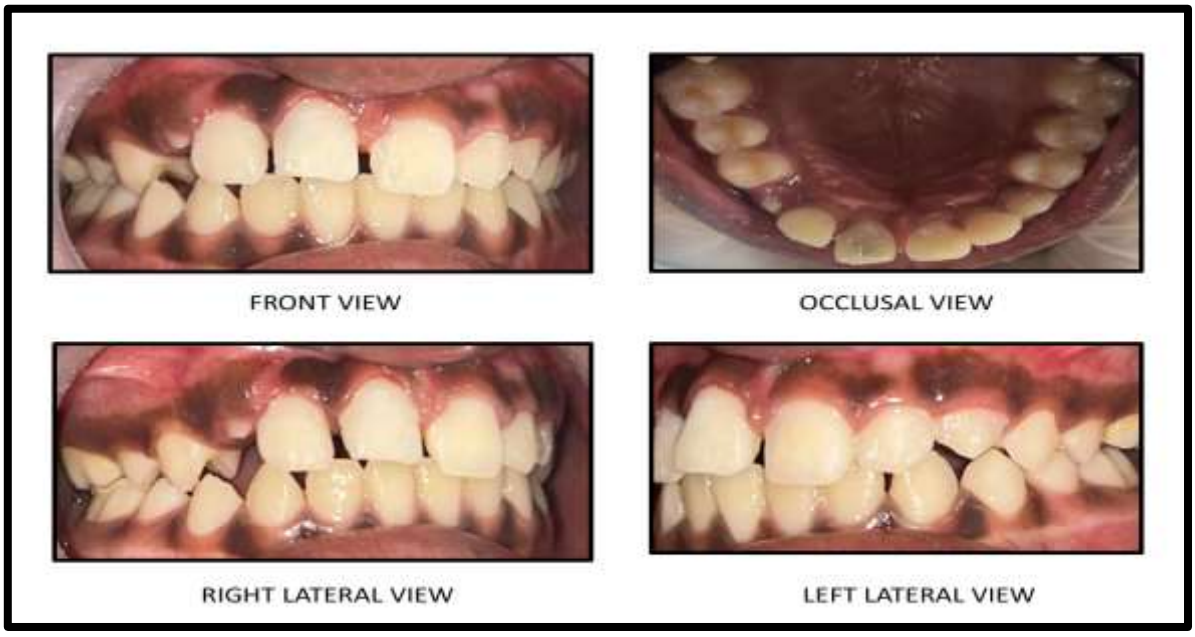

Fig 6. 1 month post-operative

DISCUSSION:

Dental traumas in immature permanent teeth are very common and these injuries affect about 30% of the children.[4]

Lateral luxation is a severe form of traumatic dental injury involving displacement of the tooth in a direction other than its long axis, often accompanied by damage to the periodontal ligament and alveolar bone. It is commonly seen in children due to increased participation in physical activities and the prominent position of anterior teeth[5]. The extent of injury depends on the magnitude and direction of the traumatic force, as well as the stage of root development.

In this instance, prompt action was implemented, which is essential for a positive outcome. Early repositioning promotes the best possible healing of periodontal structures and aids in the restoration of the proper anatomical relationship. It has been demonstrated that postponing treatment has a negative impact on periodontal and pulpal results, raising the possibility of problems including pulp necrosis and root resorption [6]. As a result, prompt treatment—as in this instance—is crucial to the prognosis.

To confirm repositioning and rule out related root or alveolar fractures, radiographic examination is crucial. Research has shown that accurate diagnosis and treatment planning for severe dental injuries depend on appropriate clinical and radiographic evaluation [7]. In this instance, proper alignment and the lack of issues were guaranteed by radiographic confirmation both before and after repositioning.

After relocation, flexible splinting is advised to promote periodontal healing and physiological movement. Because they lower the danger of ankylosis and root resorption, passive and flexible splints have been demonstrated to enhance healing results when compared to stiff splints [8]. In this instance, a flexible splint was applied in compliance with these guidelines, which helped to promote healing.

Another crucial component of treatment is occlusal adjustment, particularly when occlusal interference is present. Raising the bite with restorative materials like glass ionomer cement promotes uneventful recovery by minimizing additional damage to the damaged tooth [9]. In order to reduce functional stress on the relocated tooth, this step was included in this instance.

The stage of root growth has a significant impact on the prognosis of lateral luxation injuries. Mature teeth are more vulnerable to pulp necrosis [10], while immature teeth are more capable of pulp revascularization and periodontal repair. Long-term follow-up studies have shown that problems such ankylosis, inflammatory root resorption, and pulp canal obliteration can happen, requiring regular monitoring.[11]

Even in severe cases involving alveolar fractures, proper care, such as repositioning and splinting, can lead to good results, according to case reports with long follow-up.[12] Regular follow-up visits in this instance showed good healing with no indications of pathological alterations, underscoring the significance of following established treatment regimens.

In general, early diagnosis, timely repositioning, suitable splinting, and meticulous follow-up are necessary for the effective treatment of lateral luxation. When applied methodically, these guidelines greatly enhance the prognosis and aid in maintaining both appearance and functionality.

CONCLUSION:

Lateral luxation in immature permanent teeth requires prompt and well-coordinated management to achieve favorable outcomes. Early diagnosis, immediate repositioning, appropriate flexible splinting, and careful occlusal adjustment play a crucial role in promoting periodontal and pulpal healing. The present case highlights that adherence to established treatment protocols, along with regular follow-up, can result in successful healing and preservation of both function and esthetics, even in severe traumatic injuries.

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