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Surgical Repositioning of an Impacted Maxillary Central Incisor: A Case Report

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ABSTRACT

Impaction of the maxillary central incisors is relatively rare but can present considerable esthetic and functional challenges in pediatric patients. Treatment approaches commonly include orthodontic traction, extraction followed by prosthetic replacement, or surgical repositioning. Among these, surgical repositioning and orthodontic traction are frequently employed for managing unerupted incisors. This case report describes the successful surgical repositioning of an impacted maxillary right central incisor in a 10-year-old female patient. The comprehensive management of surgical repositioning of central incisor results in favorable outcomes after one year follow up with no evidence of root resorption, ankylosis, or periodontal breakdown. This case report emphasizes that surgical repositioning can also serve as a viable treatment option in selected cases of impacted tooth, offering predictable and timely results.

Keywords: Impacted tooth, Surgical repositioning, Maxillary central incisor

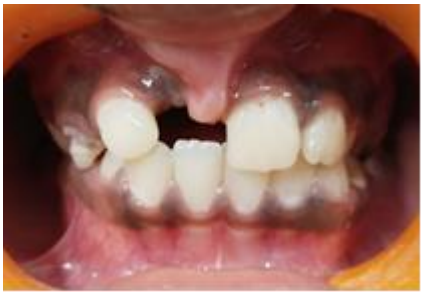
INTRODUCTION

Maxillary central incisors represent the majority of impacted maxillary incisors, comprising approximately 71% of cases, with an overall prevalence of 2% in the permanent dentition. [1] The common factors leading to tooth impaction include retention of primary teeth, the presence of supernumerary teeth, abnormal eruption paths, and inadequate space within the dental arch. [2] Trauma to the anterior region of the dentition can also displace the developing tooth germ of the central incisor, potentially resulting in complications such as root dilaceration or enamel hypoplasia. [3]

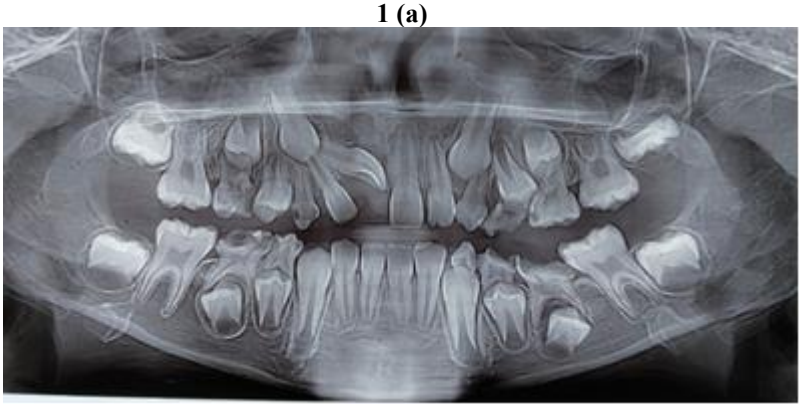
Surgical repositioning can be considered a variant of auto transplantation, as the impacted tooth is entirely displaced from its initial site and relocated into a new position in the arch, typically a centimeter or more away. [4] This case report describes the successful surgical management of an unfavorably positioned impacted central incisor in a 10-year-old female child.

CASE REPORT

A 10-year-old female child reported to the Department of Pediatric and Preventive Dentistry with the chief complaint of a missing upper front tooth. Intraoral examination revealed an impacted upper right central incisor in an unfavorable position. On palpation an intraoral bulge was palpated in upper labial mucobuccal fold in relation to the region of 11. Orthopantomogram revealed horizontally located central incisor in an unfavorable position [Figure 1].



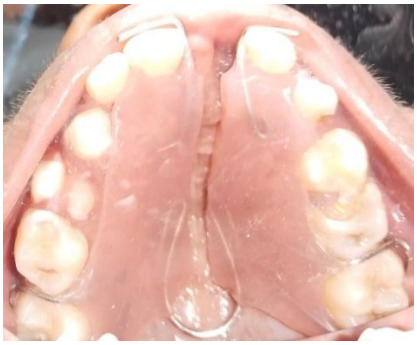
1 (a)



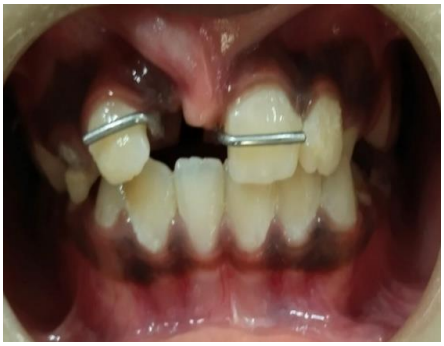
1(b)

Figure 1(a): Unerupted upper right central incisor, 1(b): Orthopantomogram showing horizontally positioned central incisor and mesially tilted lateral incisor.

Intraoral examination revealed inadequate space for surgical repositioning of the tooth due to mesially inclined right maxillary lateral incisor. To facilitate proper alignment, a removable expansion appliance with a coffin spring was fabricated and delivered [Figure 2]. The appliance was worn for a period of three months, resulting in satisfactory space gain for repositioning the impacted tooth.



2(a)



2(b)

Figure 2: Removable expansion appliance with coffin spring

Under local anesthesia, a full-thickness mucoperiosteal flap was elevated to expose the crown of the impacted incisor. The tooth was carefully luxated and repositioned into the arch using extraction forceps, taking care to avoid damage to the periodontal ligament and surrounding structures. The repositioned tooth was stabilized using a suture splint [Figure 3].

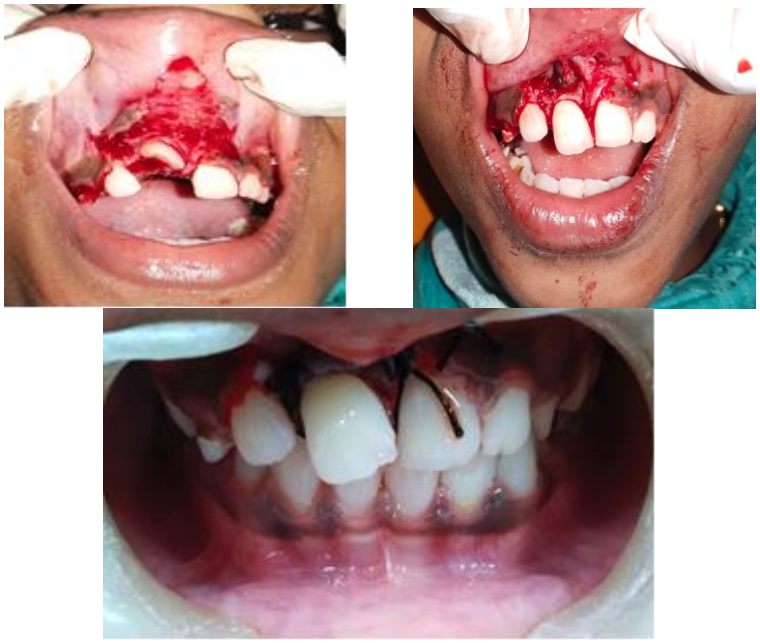
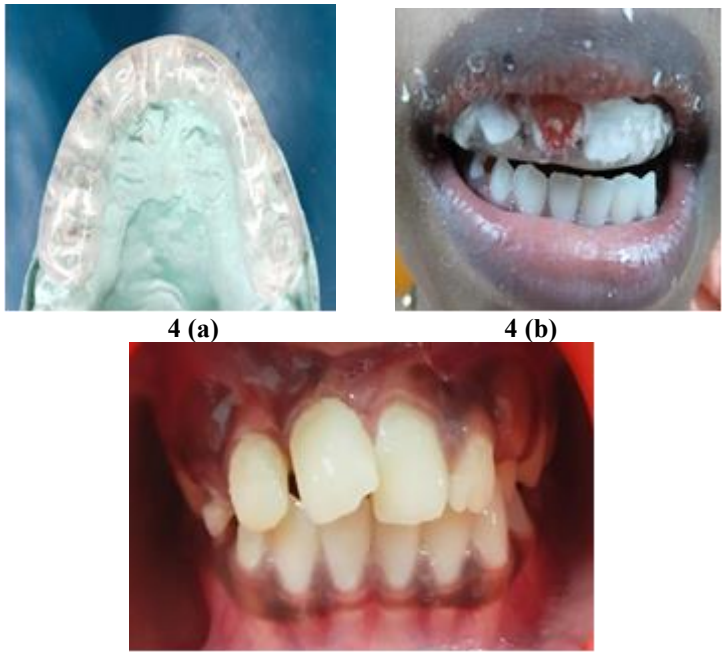


Figure 3: Surgical repositioning of tooth and initial stabilization of tooth using suture splint

An alginate impression of the upper arch was taken, and a cast was poured using dental stone. The cap splint was fabricated and cemented using Type I glass ionomer cement. The sutures were removed after 1 week and the cap splint was removed after four weeks. Clinical evaluation showed satisfactory healing of gingival tissues around the repositioned tooth [Figure 4].



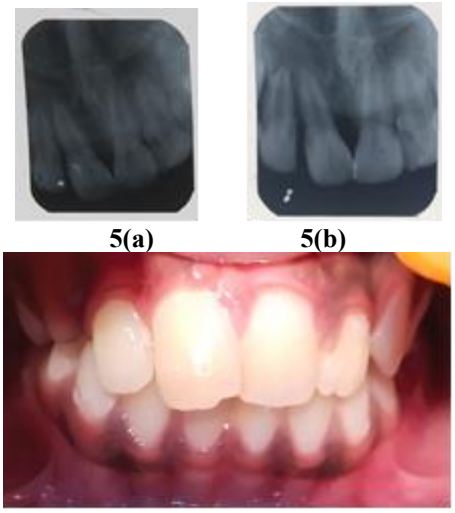
4 (a) **4 (b)**

4 (c)

Figure 4(a): Acrylic cap splint, 4(b): Cap splint cemented in upper arch, 4 (c): Post operative follow up after 1 month

The tooth showed slight mobility after 1 month follow up. The child was instructed not to bite on the tooth for the next 1 month. The child was followed up after 6 months and 1 year and intraoral periapical radiographs were taken. Both the follow up results showed favourable outcomes [Figure 5].

Clinical examination revealed normal gingival contour and colour with no signs of inflammation or infection. There was no abnormal periodontal ligament widening with no signs of root resorption, ankylosis, periapical radiolucency. Electric pulp test results also gave positive response.



5(a) 5(b)

5(c)

Figure 5 (a): Intra oral periapical radiographs after 6 months, 5(b) &5(c): After 1 year follow up

DISCUSSION

The presence of impacted maxillary central incisors has a profound impact on dental esthetics as well as facial appearance.[5] Early diagnosis plays a key role in minimizing the risk of associated complications.[6]

Treatment options for impacted incisors vary depending on the position of the tooth, space availability, stage of root development, and patient age. The various treatment approaches available are, extraction followed by prosthetic rehabilitation, surgical exposure combined with orthodontic traction or surgical repositioning.[7] The main drawback of surgical repositioning or auto transplantation is the risk of damage to the periodontal ligament, which may lead to complications such as root resorption or ankylosis. In addition, trauma to Hertwig's epithelial root sheath can occur, potentially resulting in partial or complete cessation of root development. [8]

In the present case, the impacted maxillary right central incisor was located in an unfavorable position. Due to the mesial inclination of erupted upper right lateral incisor, space was initially inadequate. A removable expansion appliance with a coffin spring was successfully used for space regaining in the initial phase. The use of expansion appliance also helps in correcting the mesial tilt of lateral incisor. Once adequate space was achieved, surgical repositioning was performed using atraumatic techniques. A cap splint was used for stabilization, a method proven effective in pediatric dental trauma management and surgical cases. The treated tooth demonstrated satisfactory esthetic and functional results, with no signs of periodontal breakdown, underscoring that, in carefully selected cases, surgical repositioning offers a predictable and timely solution for managing impacted maxillary central incisors in pediatric patients. Also, the success in this case can be attributed to appropriate case selection, atraumatic handling, and follow-up care.

CONCLUSION

This case supports existing literature that suggests surgical repositioning is a valid option when orthodontic traction is not feasible or would result in prolonged treatment. Although long term monitoring is essential, especially for detecting late

complications such as pulp necrosis, root resorption, or ankylosis, the favorable outcomes observed in this case after one year of follow up emphasize the reliability of surgical repositioning.

Declaration by Authors

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Conflict of Interest: No conflicts of interest declared.

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