

1 RESTORING THE ESTHETIC FOCAL POINT: ORTHODONTIC
2 MANAGEMENT OF AN IMPACTED MAXILLARY CENTRAL
3 INCISOR- A CASE REPORT.

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5
6 **ABSTRACT**

7 Tooth impaction is a common clinical finding in orthodontic practice and may
8 involve different teeth across the dental arch, each presenting unique diagnostic
9 and therapeutic challenges. Impaction of the maxillary central incisor is a
10 relatively uncommon condition. Despite its low prevalence, it presents
11 significant esthetic, functional, and psychological concerns in growing patients.
12 Early diagnosis and timely intervention are essential to prevent complications
13 and achieve favorable outcomes. Successful treatment depends on accurate
14 localization, controlled biomechanics, and patient cooperation. This present case
15 report describes the orthodontic management of impaction of central incisor in
16 the maxillary arch. The outcome highlights the successful alignment of the
17 impacted teeth in the dental arch restoring function, balance and esthetics.

18
19 **Keywords:** Impaction, Central Incisor, Esthetics, Interdisciplinary, Maxillary
20 arch

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24 **INTRODUCTION**

25 Tooth eruption is a physiologic process by which a developing tooth migrates
26 from its intra-osseous location to its functional position in the oral cavity.
27 Disturbances in this eruptive mechanism may result in tooth impaction.¹ Tooth
28 impaction represents a significant clinical problem in orthodontics, as it may
29 compromise dental alignment, occlusal function, facial esthetics, and
30 periodontal health besides other. The prevalence and clinical significance of
31 tooth impaction vary depending on the type of tooth involved.²

32 The maxillary central incisor plays a crucial role in facial esthetics, smile
33 harmony, speech, and functional occlusion. Delayed eruption or impaction of
34 this tooth is an uncommon occurrence, with a reported incidence of
35 approximately 0.06%–0.2%, but it can create considerable esthetic and
36 psychological distress in young patients. Because of its strategic position in the
37 anterior maxillary region, failure of eruption often becomes an immediate
38 concern for both patients and parents.³

39 Several local factors have been associated with impaction of the maxillary
40 central incisor, including supernumerary teeth, odontomas, trauma to primary
41 incisors, retained deciduous teeth, space deficiency, and abnormal tooth
42 angulation or dilaceration. If left untreated, the condition may lead to arch
43 asymmetry, loss of space, displacement of adjacent teeth, root resorption, cystic
44 changes, and compromised periodontal support.⁴

45 Accurate diagnosis aided by radiographic assessment and timely intervention
46 are essential for successful management. Contemporary treatment usually
47 involves a combined surgical and orthodontic approach aimed at facilitating
48 eruption, establishing proper alignment, and restoring optimal esthetics and
49 function.⁵

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51 **CASE REPORT:**

52 A 12-year-old male patient reported with the chief complaint of spacing in the
53 upper front tooth region. Patient had a history of fall 7 years back. On intraoral
54 examination, it was revealed that maxillary left central incisor was missing and
55 the upper midline was deviated 1 mm to the left side with Class I molar and
56 canine relation having normal overjet and a slightly increased overbite of 5 mm
57 with mild crowding in the lower anterior region. On radiographic interpretation,
58 it was unveiled that the tooth was impacted with the complete root formation.
59 (Fig 1,2)

60

61 **DIAGNOSIS:**

62 A 12-year-old male patient with Class I molar and canine relation with average
63 growth pattern had impacted left upper central incisor with mild crowding in the
64 lower anterior region.

65

66 **TREATMENT OBJECTIVES:**

67 The treatment objectives were to disimpact the impacted maxillary left central
68 incisor and to align it in the arch. To correct the deviated midline. To relieve the
69 crowding in the lower anterior region. To maintain the overjet and to achieve
70 ideal overbite. And finally, to improve the esthetics and provide a harmonious
71 smile.

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FIG:1 PRE-TREATMENT EXTRAORAL & INTRAORAL PHOTOGRAPHS

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FIG:2 PRE-TREATMENT RADIOGRAPHS -
ORTHOPANTOMOGRAM AND LATERAL CEPHALOGRAM

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79 **TREATMENT PROGRESS:**

80 Patient was planned to be treated with non-extraction treatment strategy using
81 MBT (0.022x 0.028 slot) Preadjusted Edgewise in continuous arch mechanics.
82 After reaching 0.019 x0.025 SS base archwire, the adequate space was created
83 for the impacted 21 with help of open coil spring. Closed surgical exposure was
84 done and a bondable attachment was placed, followed by traction of
85 impacted 21. The tooth was brought into occlusion followed by its levelling and
86 alignment.(Fig 3)

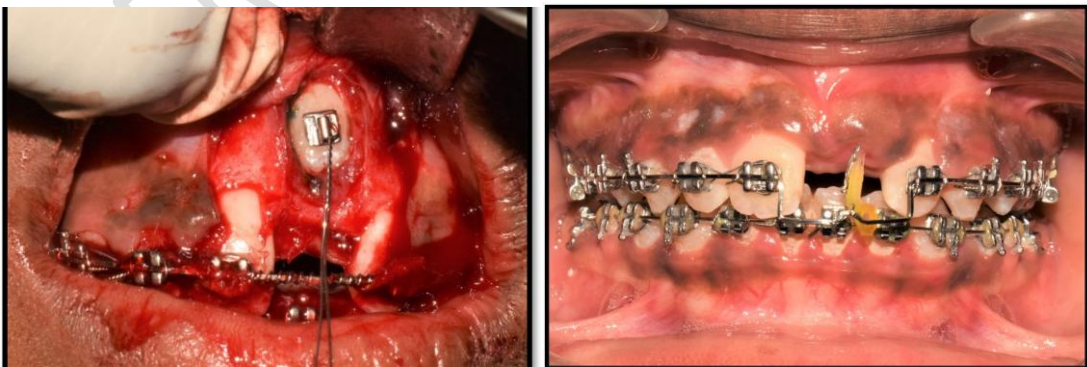


FIG:3 SURGICAL EXPOSURE OF IMPACTED 21
FOLLOWED BY PLACEMENT OF BONDABLE
ATTACHMENT AND ORTHODONTIC TRACTION

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89 **TREATMENT RESULT:**

90 It can be appreciated that the impacted incisor was successfully aligned in
91 proper position with harmonious gingival margin levels with no clinical or
92 radiographic evidence of root resorption or loss of alveolar bone support. The
93 molar and canine relations were maintained in Class I with normal overjet. The
94 dental midline symmetry and satisfactory overbite were established. The crown
95 morphology and incisal edge position were well integrated into the smile arc,
96 contributing to improved faciaesthetics and smile harmony.(Fig 4,5,6& Table



FIG:4 MID-TREATMENT INTRAORAL PHOTOGRAPHS

97 1)

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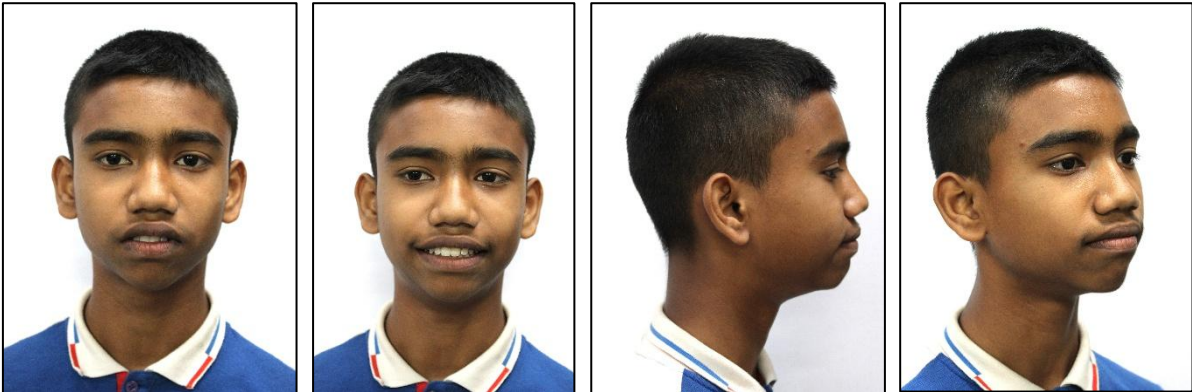


FIG:5 POST-TREATMENT EXTRAORAL & INTRAORAL PHOTOGRAPHS

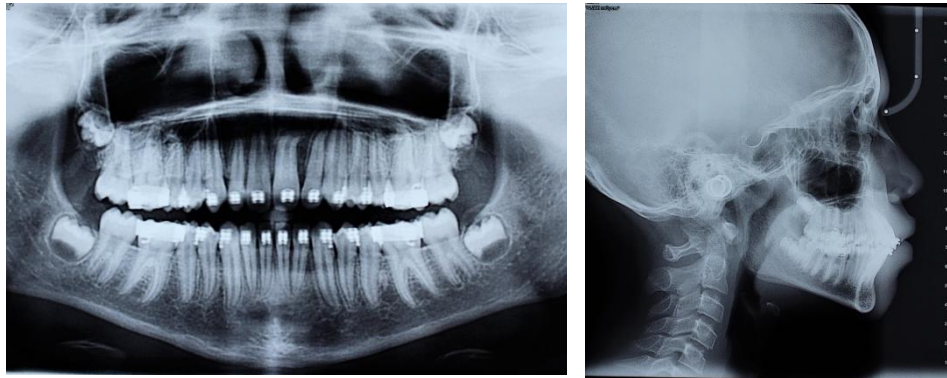


FIG:6 POST TREATMENT RADIOGRAPHS-
ORTHOPANTOMOGRAM AND LATERAL
CEPHALOGRAM

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PARAMETERS	PRE TREATMENT	POST TREATMENT
SNA	81°	81.5°
SNB	77°	78°
ANB	4°	3.5°
WIT'S APPRAISAL	+3 mm	+3 mm
UPPER CI TO NA (LINEAR/ANGULAR)	2mm / 20°	4mm / 25°
LOWER CI TO NB (LINEAR/ANGULAR)	4mm / 35°	6mm / 28°
IMPA	96°	99°
INTERINCISAL ANGLE	136°	126°
FMA	23°	24°
Y-AXIS	58°	59°
JARABAK'S RATIO	69.3%	66.3%
NASOLABIAL ANGLE	77°	78°
RICKET'S E-LINE (UPPER/LOWER)	+2 mm / +2 mm	+2 mm / +4 mm

TABLE 1: COMPARISON OF CEPHALOMETRIC VALUES
BETWEEN PRE AND POST TREATMENT

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105 **DISCUSSION**

106 Impaction of the maxillary central incisor is a relatively rare anomaly; however,
107 because of its prominent location in the dental arch, it can produce considerable
108 esthetic, functional, and psychological concerns.⁶ The condition is commonly
109 associated with supernumerary teeth, retained deciduous teeth, trauma to
110 primary incisors, odontomas, dilaceration, and inadequate arch space. Early
111 diagnosis is important to prevent long-term complications and to improve the
112 prognosis of treatment.⁷

113 If left untreated, impacted maxillary central incisors may result in several
114 complications including loss of space in the arch, midline deviation,
115 displacement or root resorption of adjacent teeth, cystic changes, periodontal
116 defects, and compromised facial esthetics. Delayed eruption of anterior teeth
117 can also negatively affect speech, mastication, and the patient's self-confidence
118 during growing years.⁴

119 The management of impacted maxillary central incisors depends on factors such
120 as the patient's age, root development, tooth position, and associated
121 pathology.⁸ Different treatment approaches have been described in the literature.
122 Removal of the etiologic factor alone may be sufficient when spontaneous
123 eruption potential exists. In cases where eruption does not occur naturally,
124 surgical exposure followed by orthodontic traction is considered the treatment
125 of choice. Surgical repositioning or extraction may be indicated in severely
126 dilacerated, ankylosed, or unfavorably positioned teeth with poor prognosis.^{9,10}

127 In the present case, a combined surgical–orthodontic approach was employed to
128 guide the impacted incisor into the dental arch. Light orthodontic forces and
129 controlled biomechanics helped achieve proper alignment while maintaining
130 periodontal health and gingival esthetics. The successful outcome of this case
131 emphasizes the importance of timely intervention, accurate diagnosis, and
132 interdisciplinary management in achieving favorable esthetic and functional
133 results.²

134

135 **CONCLUSION**

136 Impacted teeth occurring in various regions of the dental arch present distinctive
137 diagnostic and biomechanical challenges that demand a tailored, tooth-specific
138 approach. Predictable outcomes are achieved through precise localization,

139 timely intervention, and the judicious application of controlled orthodontic
140 forces following appropriate surgical exposure.¹¹ Ultimately, successful
141 management should aim at conserving the natural dentition while restoring
142 esthetics, arch integrity, functional occlusion, and long-term periodontal health.

143

144 **PATIENT CONSENT**

145 Written informed consent obtained from the patient for publication of records
146 and images.

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148 **CONFLICT OF INTEREST**

149 None declared.

150

151 **SOURCE OF FUNDING**

152 Nil.

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