

Assessment of Inverted Mandibular Third Molar Impaction by 3d Reconstruction -A Rare Case Series

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Abstract : A tooth which failed to erupt fully or emerged partially, it is considered to be impacted. Impaction is most common with the wisdom tooth because they are the last tooth to erupt in the oral cavity. An impacted tooth remain stuck in gum tissue or bone for various reasons, as in overcrowded regions were there could be no room for them to emerge or if the jaw is too small to fit the wisdom tooth. Tooth may also become twisted, tilted or displaced as they try to emerge in closed space resulting in impaction. Inversion of the impacted tooth is a rare condition. A very rare case of inverted & impacted mandibular third molars have been reported in the literature. The present case series represents the three cases of inverted impacted mandibular third molar also highlighting the importance of cone beam computed tomography in detection & treatment planning of this.

Keywords : 3D Reconstruction, Impacted IIIrd molar, OPG, Reimplantation, Surgical intervention

I. Introduction

The word impaction derived from Latin word 'Impactus' meaning Cessation of eruption caused by physical barrier / ectopic eruption. The tooth is said to be impacted when its path of eruption into the occlusal plane is obstructed by the presence of another tooth, bone or soft tissue¹. Reviewing the literatures, the most frequently impacted tooth was mandibular third molar approximately 98 % of all impaction,² followed by the maxillary third molars, maxillary canines and mandibular premolars. The frequency of third molar impaction varies among different populations; and was reported to range from 18% to 70%.³⁻⁷

Ortho Panoramic radiograph (OPG) is the technique of choice to evaluate the position of impacted third molars. It is used to assess the angular position of impaction, level of impaction and amount of covering bone. In addition, panoramic radiograph is a reliable tool to evaluate the relationship between inferior alveolar canal and third molars.⁸

In the current case series Ortho Panoramic radiograph (OPG) as well as cone beam computed tomography (CBCT) has been used to confirm the location of impacted molars.

A very few cases of inverted and impacted third molars have been reported in the literature. The present case series describe a few case of inverted impacted unilateral mandibular third molar.

II. CASE REPORTS

2.1 Case 1

A 45 year old male patient was reported to the Department of Conservative Dentistry And Endodontic, Career Post Graduate Institute of Dental Sciences, Lucknow, India, with the chief complains of pain in relation to both upper right & left posterior region and also complained of food impaction & dull pain in lower right posterior region since last 2-3 month. Medical history was not significant. On Intra oral examination right and left maxillary first molar and right mandibular second molar are found carious. OPG was taken to assess the status of other carious teeth. Accidentally an inverted impacted mandibular third molar was detected in right mandibular molar region (fig. 1 and 2).

2.2 Case 2

A 35 year old male patient reported to the Department of Conservative Dentistry And Endodontics, Career Post Graduate Institute of Dental Sciences, Lucknow, India, with the chief complain of pain in relation to lower right region of mouth. Intraoral periapical radiograph revealed the presence of caries in relation to right mandibular second molar region. Impacted third molar was also seen with its mesial aspect, digital Ortho Pantomo Gram was planned .Radiograph revealed the presence of impacted third molars in both the mandible and maxilla and the impacted mandibular molars was also inverted (fig 3 and 4).

2.3 Case3

A 26 year old female patient was reported to the Department of Conservative Dentistry And Endodontics, Career Post Graduate Institute Of Dental Sciences, Lucknow, India, with the chief complain of pain in left lower region since one week. Pain was dull and intermittent in nature which aggravated on taking hot and at night but it was relieved on taking medicine. Medical history was non-contributory. On clinical examination left maxillary second molar, left mandibular first molar and right mandibular third molar were found to be carious, restoration present in respect to right maxillary third molar and crown in respect to right maxillary first molar and right mandibular second premolar. Patient was advised an OPG in order to an assessment of complete dentition. On radiographic evaluation an inverted impacted mandibular third molar was detected. Patient had no complain regarding inverted impacted mandibular molar (fig 5).

III. Discussion

Third molar impaction is a most commonly reported in modern era. An impacted tooth is one, which is prevented from its normal path of eruption in the dental arch due to lack of space in the arch or obstruction in the eruptive pathway of the tooth⁹. There is increased incidence of unerupted third molars may cause numerous complications therefore assessment of third molars in terms of its position, angulation and level in relation to arch is a necessary intervention for better patient management. After all the assessment decision should be taken whether tooth to be retain or remove from the arch.

Several factors have been suggested to explain the etiology of third molar impaction; it includes the retardation of facial growth, space limitation (anteroposterior or transverse), distal direction of eruption, early physical maturity, late third molar mineralization or lack of sufficient eruption force.¹⁰ The decision of treatment protocol for III rd molar whether it is conservative or surgical, depends on the tooth follicle with or without pathological changes and secondly on the patient's need in terms of esthetics, function and behaviour.

The risk factors associated the surgical removal of inverted impaction should be overviewed carefully and communicated to the patient. The inverted impaction has been called a complicated impaction¹¹. Patient's consent for whether to or not proceed must be obtained¹².

The surgical intervention for inverted molars is more complicated than other types of impactions because the abnormal position of the crown makes it greatly inaccessible and requires extensive bone removal, loss of excessive bone and nerve damage is the major disadvantage in such cases^{13,14}. Reimplantation of inverted tooth or inverted tooth germ in upright position is one of the possible treatment protocols^{15,16}. Reimplantation is always accompanied with multidisciplinary approach. Periapical radiograph play a major role detecting the position of these impacted teeth in relation to other anatomic structures. The location of impacted molar with its surrounding bone, mandibular canal and adjacent tooth are important for the proper surgical planning. Long cone parallel periapical radiograph is used for detecting the impacted molars because of following reasons – radiation dose is low and exact relationship between the adjacent teeth and height of bone can be calculated¹⁷. But the relation of mandibular canal with third molar region could not be clearly identified in this technique¹⁸.

Whenever we want to see a large specific region ortho pantomo graph can be used. The key advantages of OPG are very low radiation exposure as well as large coverage of oral structures. The most important disadvantages of both periapical radiograph and OPG is they represents a two-dimensional view of an three-dimensional anatomic relationships and OPG also fails to show accurate buccolingual relationship between the tooth and the inferior alveolar canal ^{19,20}.

Cone Beam Computed Tomography (CBCT) can be used as technique of choice where three dimensional view of mandibular third molar and its adjacent anatomical structures are required ^{21,22}. Hence, CBCT contributes to optimal risk assessment and adequate surgical planning, compared with panoramic radiography

4 FIGURES



Fig 1. Digital OPG

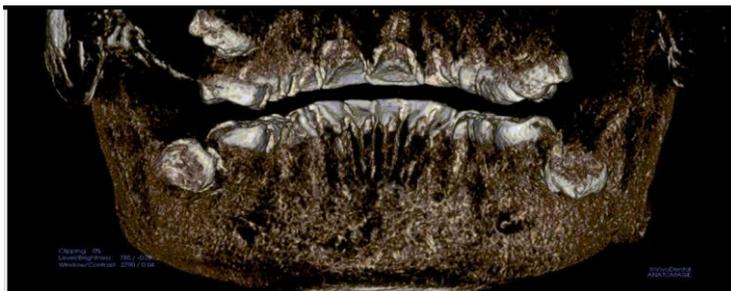


Fig 2. 3D Reconstruction of CBCT ,Linguo-Buccal veiw

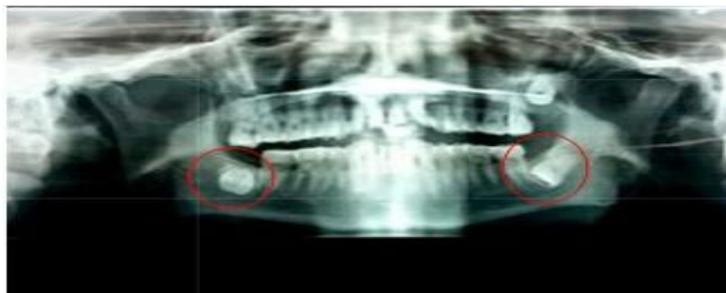


Fig 3. Digital OPG



Fig 4. 3D Reconstruction of CBCT ,Linguo-Buccal veiw



Fig 5. Digital OPG

IV. Conclusion

Impaction of mandibular molar in inverted direction is a rare occurrence. This series of case reports would therefore add to the present academic literature available. In our view, the risks of removal of such asymptomatic teeth should be carefully weighed with the benefits of retaining.

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