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Review Article

Diagnosis and Treatment of Impacted Tooth in Children: A Literature Review

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Received: July 10, 2019; **Published:** July 19, 2019

Abstract

Teeth impaction is a pathological condition where the teeth fail to attain a normal position. The incidence of teeth impaction is highly heterogeneous among different populations and usually is affected by many factors including; eruption time, age, environmental and genetic factors. Canines and second premolars are the most common impacted teeth in both jaws. Nevertheless, the impaction of third molars is quite common and higher when compared to other teeth. Impacted teeth may be asymptomatic or may be combined with other pathologies such as cysts, caries, tumors, root resorption, and pericoronitis. Diagnosis of a dental impaction as early as possible allows better management of the condition and decreases the possible complication that may alter daily masticatory activities. A combination of good clinical examination along with radiological investigation is the key factor in reaching a proper diagnosis. Evaluation of impaction degree and it is associated complications determine the management strategy. In the present paper, the authors present an overview of teeth impaction in terms of diagnosis and treatment.

Keywords: *Impaction; Teeth; Diagnosis; Treatment*

Introduction

Being a complex process, teeth eruption may be associated with retardation or failure. Accordingly, the subsequent failure of the eruption of permanent teeth and impaction is a common anomaly in dental practice among pediatric ages [1]. It has been reported in the previous literature that teeth impaction is a common incident which is affected by many factors including; eruption time, aging, environmental and genetic factors causing developmental disturbances [2]. Accordingly, the dental impaction incidence is heterogeneous among different populations, races and ethnic groups [3]. A wide variety of complications can be associated with dental impaction ranging from simple to life-threatening ones. The most common associated simple problems include; odontogenic keratocyst, subsequent dentigerous cyst, and hyperplastic follicular space [4,5]. On the other hand, the dangerous complications include the cystic wall's malignant transfor-

mation with a subsequent mucoepidermoid carcinoma or squamous cell carcinoma [6]. Accordingly, different life-threatening conditions may complicate a simple problem like dental impaction. If it was solved at the beginning, it would have been much easier and cost much less [6].

Permanent teeth impaction, except for the third molar, is a frequent phenomenon with a prevalence rate ranging from 2.9% to 13.7% [1,7-14]. Canines and second premolars are the most common impacted teeth in both jaws with variable incidence rates [1,7-13,15-17]. The treatment and alignment of impacted teeth to the normal position require a complicated and prolonged plan. Moreover, the prognosis and correction difficulty are also affected by a lot of factors which may be related to the patient, associated malocclusion and the features of the impacted tooth itself [15-19]. This study aims to present an overview of diagnosis and treatment strategies of the impacted teeth.

Diagnosis

Diagnosis of dental impaction at an early age allows better management of the condition and decreases the possible negative consequences that may alter daily masticatory activities.

Inspection and clinical symptoms

The most appropriate age for visual diagnosis is 10 years with factors related to age, nutritional status, socioeconomic level and appropriate dental care which may results in individual variations where diagnosis can be obtained earlier or later than 10 years of age [20-22]. Patients with dental impaction usually presents with pericoronitis and dental caries, therefore impaction diagnosis must be suspected [23].

Palpation

The position of the erupted tooth can be estimated through palpation of buccal and lingual mucosa palpation using the two index fingers from the practitioner. However, palpation should follow a chronological manner and assessment of the age at which different types of teeth palpated are essential for proper detection of dental impaction [20].

Radiography

Occasionally, some cases of dental impaction can not be assessed after using the previous measures, a radiograph is indicated to determine the level of impaction with its corresponding degree or complications [24]. Clark's rule is used for the diagnosis of dental impaction using radiography. The rule was built upon the change of position of teeth partially or buccally relative to adjacent teeth. Several studies have assessed the potential role of radiography in identifying dental impaction [25,26]. Not only utilized to assess impacted teeth but also for diagnosis of associated complications such as widened pericoronal space and severe loss of marginal bone [27]. It is worth noting that dental impaction originates from mandibular teeth rather than maxillary ones, thus regular radiographic examinations in high-risk populations comprise a crucial role in early detection and consequently proper management [27].

Computed tomography

Although Computed Tomography (CT) is quite rare in dental practice, the overlap between bony parts of maxilla and teeth has limited the use of radiographs and indicated the need for a more accurate diagnostic procedure for dental impaction diagnosis [28]. Therefore, CT has been recently used as an effective approach for better visualization of dental structures and implying more accurate diagnosis [29]. In a preliminary report, CT elects a more accurate measure for diagnosis of nerve injuries during mandibular tooth extraction compared to panoramic radiograph; furthermore, the clinical decision based upon CT has changed the risk of nerve injury from high-risk patients based upon panoramic findings into low-risk patients [30]. Moreover, CT yielded an accuracy of 80% of nerve exposure at the extraction compared to 64% accuracy from panoramic imaging [31]. Despite being an effective diagnostic approach for dental impaction diagnosis, stratification of risks related to radiation must be evaluated.

Treatment

The goal of dental impaction treatment is to restore mandibular overbite and overjet for normal masticatory process in addition to the restoration of the cosmetic appearance after treatment which constitutes a cornerstone in the physical and psychological life of individuals. Evaluation of impaction degree and it is associated complications determine the management strategy. Non-invasive techniques must be implied before shifting to invasive ones which are associated with serious complications. Physicians usually start the management of dental impaction in children with observation and follow up for giving the teeth the proper time for development and to restore it is natural position. Moreover, bras ligature insertion can provide an alternative approach for allowing normal tooth eruption; however, this procedure is of limited value if the tooth is associated with high-grade impaction [32].

Surgical extraction of impacted teeth remains the widely accepted methodological approach for dental impaction management despite induction of periodontal tissue damage [33]. Surgery is indicated if the impacted teeth enhance pathological complications such as infection, exposition of the impacted teeth into external or internal root resorption and the possible damage of severely impacted teeth during orthodontic movement [34]. Potent analgesics are prescribed for limiting post-operative pain which alters patient daily activity till wound healing occurs [35]. Furthermore, antibiotics exhibit a crucial role in the prevention of post-operative infections and allow normal wound healing [36].

Furthermore, to evaluate the capacity of tissue healing regarding each individual which differ according to age, sex, probing depth and direction of eruption [37], a regular post-operative follow-up exhibit a potential part of management due to the associated surgery complications that need rapid intervention before progression into fatal diseases especially infective endocarditis [38]. Moreover, third molar extraction is associated with gingivitis, plaques and periodontal pockets after 2 years of follow up [39].

Conclusion

Teeth impaction is a complicated process affected by many factors and widely variable among populations and ethnic groups. A proper and early diagnosis is a must to avoid dangerous complications and to restore normal physiological functions as much as possible. Moreover, the treatment strategy should be tailored for every patient on an individual basis to get the best results possible.

Acknowledgments

None.

Conflict of Interest

None.

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Volume 18 Issue 8 August 2019