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Pediatrics

Diagnosis and Conservative Management of
Pathological Intrabony Distal Displacement of
Developing Premolar Tooth Buds

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OBJECTIVE: To examine the relationship between intrabony displacement of involved premolar tooth buds associated with preceding primary molar pathologies and could their path be self correcting if associated etiological reason managed in time.

METHOD: A series of cases of pathologically displaced premolar tooth buds were managed with conservative approach. Radiographic diagnosis of these cases along with two representative cases of intrabony pathological displacement of maxillary and mandibular tooth buds are discussed here with clinical radiographic and histological follow up.

RESULTS: Ectopic eruption of premolars can be predicted radiographically even before the starting of root formation due to associated pathologies of preceding primary molars .All cases could be managed conservatively but only when associated pathology was checked in time

CONCLUSION: Even severest forms of intrabony altered path of erupting of developing premolars, associated with periradicular pathology of the primary teeth, can be successfully managed conservatively with timely intervention.

KEYWORDS Displace

Introduction

ABSTRACT

Pathology involving periradicular area of primary teeth affects eruption and development of permanent successors. Maintenance of healthy primary tooth is primary requirement for uneventful eruption of its permanent successors(1, 2, 3). Periapical infection of primary teeth due to untreated caries or trauma may lead to disturbance in eruption, hypoplastic enamel, aberrant tooth development and even arrested development of permanent successors in severe cases. Permanent teeth alteration due to inflammation/ infection of primary predecessor, are related to eruption problem. Etiologic factors may be the space loss, ectopic position of tooth germ, ankylosed primary molars, presence of supernumerary teeth or odontomas, marginal or periodontal inflammatory condition of primary teeth.

This paper presents cases of permanent second premolar teeth that showed distal intrabony deviated path of eruption as a consequence of associated inflammatory, granulomatous cystic or altered healing pathology in their respective primary molar predecessor.

Case reports

Case 1

An eight year old female child reported to dental OPD, with the chief complaint of dull pain and swelling in lower left back tooth started 3-4 months back. Spontaneous Frequent pus discharge was also associated with swelling which occurs spontaneously followed by intermittent remissions. The patient was apparently healthy with no significant past medical history. Extra oral examination revealed a bony hard swelling on left border of mandible which was diffused and tender on palpation. Intraoral examination revealed grossly carious primary mandibular left second molar with faulty restoration. The tooth was non vital with deep pocket and purulent discharge. Swelling had caused expansion of alveolus around primary mandibular second molar.



Figure 1

Clinical picture of case 1 showing self correction in path of premolar 35 tooth bud after conservative management Intra oral periapical radiograph (Figure 1) showed a large, unilocular, well defined periapical radiolucency in relation to primary mandibular second molar which was extending up to the apical portion of its permanent successor. Radiolucency of lumen of cystic cavity was in direct association of apices of primary second molar and this radiolucency seemed to be deflected the path of eruption of permanent mandibular left second premolar. No pathological resorption was observed in the roots. Radiographic diagnosis made was an ectopically erupting immature premolar with half the root formation and surrounded by an abnormal radiolucency.

Treatment approach

As the second premolar was immature, conservative surgical eruptive guidance was planned. The treatment consisted of extraction of non vital primary mandibular left second molar following which permanent mandibular left second premolar was exposed under local anaesthesia. Marsupialization was performed and sutures were placed. Soft tissue sample was sent for biopsy.

Histological examination



Figure 2

Histopathological examination of case 1

H& E stained (Figure 2) section showed stratified squamous epithelium lining with chronic inflammatory cells and abundant extravagated RBCs in connective tissue suggestive of radicular cyst. This radicular cyst was involving the erupting premolar.

After one week sutures were removed. Patient was followed up after one week, one month & three months. Radiographic follow up revealed that tooth continued to erupt with continued root formation suggestive of pulp revascularization. ClinISSN - 2250-1991 | IF : 5.215 | IC Value : 79.96

ical follow up revealed that swelling had disappeared three month post-operatively and permanent mandibular left second premolar was erupting. Uneventful eruption of premolar with normal physiological root formation was observed needing no treatment thereafter.

CASE 2

A 14 yr old young girl reported to our department with chief complaint of painless swelling on palate. Clinical examination showed retained primary maxillary left second molar (Figure 3). A bluish dome shaped swelling present palatal to primary maxillary second molar which was hard, non tender and measured 1× 1 cm.



Figure 3

Clinical picture of case 2 showing self correction in path of premolar 25 after conservative management

Radiographic examination

Occlusal radiograph of maxilla revealed palatally erupting permanent maxillary left second premolar which had pushed primary maxillary second molar to buccal side

Intra-oral periapical radiograph was then done to rule out any associated pathology and also to know the status of root development of permanent maxillary left second premolar. It revealed ankylosis of primary maxillary molar of left side. Root development of permanent maxillary left second premolar equalled to its crown length.

Conservative surgical eruption guidance was planned for ectopically erupting immature premolar. Extraction of primary maxillary left second molar was carried out. Following extraction there was tenacious fibrous tissue overlying permanent maxillary left second premolar which was surgically removed to expose it. The biopsy specimen was sent for histo pathological examination. H&E stained section revealed stratified squamous epithelium and connective tissue. The surface epithelium showed dysplastic features with pseudostartified hyperplasia and connective tissue showed chronic inflammatory cells.

One month after surgical eruption guidance, ectopically erupting premolar was well aligned in the arch.

Discussion

Premolars are formed by extension of dental lamina lingual to primary molars with tooth germs located centrally between roots of primary molars. Eruptive movements of premolars start at age of 9-10 years and emergence usually takes place at 11- 12 years. The eruption routes are guided by presence of gubernacular canals. Alteration in eruption of a permanent tooth can appear at time and in the route of eruption, being related to destruction of gubernacular canal through the spread of infection in the periradicular bone. The second premolar can develop with a variable degree of rotation and inclination. These variations do not always occur symmetrically across the dental arch. The tooth bud may develop under the distal root of the deciduous second molar in a vertical or in an oblique position. Although the bud often is distally inclined, it can be angled in a buccolingual direction (4). Logan and Kronfeld (5) documented that it is common for the mandibular second premolar to have a distal inclination after the dental roots began to form. Rose (6) also reported that the mandibular second premolar more often has a distal rather than a mesial inclination. Distal bodily movement of developing mandibular second premolar in early stages of tooth mineralization i.e C, D, E leads to obvious mechanical obstruction with respect to permanent molar. The mechanism of normal eruption is a complex phenomenon including various factors. Mechanical impaction is the most common cause of ectopic eruption followed by presence of supernumerary teeth, mucosal abnormalities, scar tissue, cystic lesion and tumors (7).

One of the aetiology of cyst formation is prolonged and persistent infection of primary tooth leading to chronic irritation of associated permanent tooth follicle (8). The occurrence of radicular cysts in primary dentition is 0.5-3.3% as compared to 7-54% in permanent dentition (9). Another factor contributing to development of radicular cyst is chronic irritation of epithelial rest of Malassez due to infection in periradicular areas of a tooth (10) which are more common in permanent teeth than in primary teeth (11). If a cyst develops in primary teeth, it can lead to subsequent involvement of permanent tooth germ leading to formation of dentigerous cyst. Radicular Cyst are reported to occur more in males (3-19 years) than females (10, 12). Also the mandibular molars (67%) are the most commonly involved primary teeth followed by maxillary molars (17%) and then anterior teeth¹². Bloch-Jorgensen (13) reported 22 follicular cyst cases with conclusion of primary teeth being the etiology of cyst cavity formation in developing permanent tooth in 100% cases. Periapical radiolucency in relation to primary teeth shown to be differentiated from periapical granuloma of primary teeth, or dentigerous cyst from permanent successor by histopathological examination. Rodd et al (14) reported higher immunocompetency of pulpal cells in primary teeth than in the permanent teeth; however no difference was observed among primary and permanent tooth in the inflammatory reaction response to caries. Fusion of follicular lining of an erupting tooth with the oral mucosa is an important step of eruptive process; failure of this step along with thickening of mucosal barrier may cause deflection and ectopic eruption of the affected permanent tooth. Immediate surgical removal is advised; which leads to eruption without any other manipulation. The path of least resistance probably determines the direction of movement of the displaced premolar. It follows the direction of its long axis, with the crown leading the displacement (15). Diseases affecting normal histological structure of overlying mucosa of erupting permanent tooth can leads to ectopic or arrested eruption. Vitamin C deficiency, hormonal or hereditary diseases, phenytoin drug interaction might cause dense connective tissue or acellular collagen; which leads to mucosal thickening and mechanical impaction of erupting tooth(16). Ectopic eruption pattern of premolars are usually discovered by systemic radiographic screening. Radiographic examination provides important information about status of root development, and relation between unerupted premolars and associated structures which is of utmost importance in treatment planning.

Treatment choice depends upon etiologic factors. Minimal invasive therapy like removal of mucosal barrier, treatment of diseased primary tooth in time, marsupialization of cyst along with close follow up is recommended. In conclusion; goal of any surgical procedure conducted on pathology of primary tooth is to prevent the damage to underlying permanent tooth germ. In both the cases, 2nd premolars were immature, so conservative treatment was planned. With suspected diagnosis of cysts in both the cases, extraction of primary second molars followed by surgical eruption guidance of premolars was performed. Histopathological diagnosis confirmed the suspected diagnosis of cyst in first case. Ectopically erupting teeth must be closely monitored until normal eruption of tooth occurs.

Conclusion

This article discusses intraobony migration of second premolar from its normal eruptive path, a serious aberration as a result of inflammation / infection associated with its primary predecessor. Radiographic diagnosis in such cases should be supplemented by histopathological examination and minimally invasive approach should be followed.

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