Presentation and Sources of Pediatric Odontogenic Infection

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Abstract

Background and Objectives: The causes, clinical presentation and management of the odontogenic infection in children during the mixed and premixed dentition period should be thoroughly studied as it differs from that of adults. The study aimed to identify the common sources and presentation of dental infection in those children.

Methods: The selected cases were 122 (54 females and 68 males). All cases presented with odontogenic infection, examined meticulously to diagnose the source of infection.

Results: The mean age was 6.5 years old (The age range was 3-10 years). The most common source of infection in primary teeth was the second primary molars (38 cases; 31.1%). The most common source of infection in permanent teeth was the first permanent lower molars (30 cases; 24.6%). The most common presentation was vestibular swelling (56 cases; 45.9%).

Conclusion: Dental care should be provided early especially to the permanent first molars in children to avoid losing them. Teamwork between the oral surgeon and the general pediatrician is necessary for better management.

Keywords: *Odontogenic infection; dental abscess; surgical drainage; fascial spaces.*

Introduction

Dental caries is a chronic disease affecting especially children, with more aggressive behavior than in adults, causing tooth decay. The modern lifestyle fill of high-sugar content sweeties with the unwillingness of the children to brush their teeth makes tooth decay more destructive. Lack of parents monitoring of the dental health of their children makes the tooth decay having a poor prognosis.[1, 2]

Untreated dental caries may end with an odontogenic infection presented clinically as an oral and/or facial swelling along with the tenderness of the accused tooth on eating, pus discharge from oral sinus or orocutaneous fistula. An oral and maxillofacial surgeon must manage the infection by providing antibiotic coverage either orally or intravenously in the hospital if the acute status of infection present, the surgical part include pus drainage by incision, tooth extraction or through the root canal. Despite appropriate antibiotic coverage, severe odontogenic infection or its complications such as Ludwig angina may occur.[3, 4]

The most common causative source of odontogenic infection is dental caries; other causes include periodontal abscess, pericoronitis, unsuccessful endodontic treatment or deep-seated tooth fillings. All these sources end with bacterial invasion of the root canal to form thereafter a periapical lesion that spread to the adjacent fascial spaces.[5, 6]

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The aim of the study was to identify the sources and the clinical presentation of odontogenic infection in children during the age of 3-10 years old.

Materials and Methods

The study involved 122 patients received at the department of oral and maxillofacial surgery with the initial presentation of intra- or extra-oral swelling or draining sinuses; the diagnosis of all cases was an odontogenic infection. There were 54 females (44.3%) and 68 males (55.7%).

All the cases pass through the routine examination protocol; history, clinical and radiological examinations to locate the exact causative tooth and to define the appropriate treatment plan.

Results

The age range of the cases was (3-10 years); the mean age was 6.5 years old. The majority of cases (117 cases; 95.9%) were treated as outpatient, while five cases (4.1%) needed admission to the hospital for better management. The primary teeth were the source of the infection in 74 cases (60.67%), while the permanent teeth were the source of infection in 48 cases (39.3%).

The majority of cases (92 cases; 75.4%) were managed by tooth extraction, while the other cases (30 cases; 24.6%) were managed by root canal therapy.

The total number of the primary teeth involved was 74 (60.7%), while the permanent teeth were 48 (39.3%). The most common cause of infection was caries (109 cases; 89.3%) followed by traumatic pulp necrosis to upper incisors (13 cases; 10.7%).

As shown in table 1, the most common source of infection in primary teeth was the second primary molars (38 cases; 31.1%). The most common source of infection in permanent teeth during mixed dentition was the first permanent lower molars (30 cases; 24.6%).

The most common chief complaint was swelling (110 cases; 90.2%) (Table 2). During clinical examination, the most common presentation was vestibular swelling (56 cases; 45.9%) (Table 3) (Fig. 1).

Figure 1: Vestibular swelling associated with the primary lower second molar

Figure 2: Orocutaneous fistula associated with the primary upper second molar

Table 1: The sources of infection.

Involved tooth	No.	Percentage
1st primary molar	20	16.4%
2nd primary molar	38	31.1%
Upper primary incisors	15	12.3%
Lower primary canine	1	0.82%
Upper permanent central incisors	13	10.7%
1st permanent upper molar	5	4.1%
1st permanent lower molar	30	24.6%
Total	122	

Table 2: The most common complaint of the patients

Chief Complain	No.	Percentage
Pain	10	8.2%
Swelling	110	90.2%
Limited Mouth Opening	1	0.8%
Extra-oral Fistula	1	0.8%
Total	122	

Table 3: Types of lesions at presentation

Type of Lesion	No.	Percentage
Intra Oral Sinus	27	22.1%
Vestibular Swelling	56	45.9%
Facial Swelling	38	31.1%
Extra-oral Fistula	1	0.82%
Total	122	

Discussion

The first line of antibiotics for odontogenic infection is amoxicillin or clindamycin, erythromycin is less effective especially with severe odontogenic infection[7]. Good choice of antibiotics hasten the healing, shorten the hospital stay and delay dental or surgical procedures[5]. The study protocol was to use amoxicillin/clavulanic acid, if the child sensitive to penicillin, clindamycin is the drug of choice as a substitute. Antibiotic coverage is not enough if surgery does not treat the accused tooth or drain the pus.[8]

If the treatment plan involves tooth extraction, the accused tooth (the source of infection) extracted as soon as possible after the acute phase of infection disappeared for better resolution of the infection and to decrease the hospital stay[5]. Management of the dental abscess or odontogenic infection is similar in both primary as well as permanent teeth except in the way of treatment of the accused tooth; we try to save the permanent tooth by root canal therapy rather than a tooth extraction.

Diagnosis of the mild to moderate orofacial infection is straightforward by history, clinical as well as radiological examinations (the study used orthopantomograph screening imaging technique), whereas in severe type of infection computed tomography with contrast is the ideal technique to focus on the most dependent area of the pus for easy surgical access.[9]

Whether to treat the patient as an outpatient or plan for admission to the hospital, authors put criteria to select admission, include severe cellulitis, shortness of breath, difficulty in swallowing, involvement of deep spaces, high fever, severe limitation of mouth opening, uncooperative patients and immunodeficiency[10, 11]. We admitted five cases to the hospital, as they were uncooperative and with limited mouth opening, one case with multiple space involvement. Infection with multiple space involvement increase the severity of the infection and in most cases warrant the admission to the hospital[12]. Only one case (0.8%) of multiple space infection in our study was observed.

The family motivation to seek dental care was the appearance of swelling intra- or extraoral which indicates delay in providing proper early dental care. Differential diagnosis of orocutaneous fistula (Fig. 2) include many skin lesions, this is one of the main causes of treatment delay as the parents and the general pediatricians deal with it as a skin lesion[13]. To avoid misdiagnosis and mismanagement, teamwork between parents, general pediatricians and oral surgeons should be made whenever extraoral facial draining fistula present.

Conclusion

The study concluded the following; dental care should be provided to the primary and permanent carious lesion in children as early as possible to prevent

further spread of infection especially to the permanent first molars. Teamwork between the oral surgeon, the parents and the general pediatrician is necessary for better management of the facial draining fistula. It is better to do tooth extraction for the badly carious primary tooth rather than lengthy conservative treatment if the tooth is associated with a dental abscess, while the opposite is correct for the permanent teeth; it is better to do conservative treatment rather than extraction.

Declarations

Conflict of Interest the authors declare that there are no potential conflicts of interest related to the study.

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Ethical Clearance: This research has exemption as it a routine treatment (no new materials were used).

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