Original Article

ODONTOGENIC PRIMARY FACIAL SPACE INFECTIONS — A STUDY

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ABSTRACT

Objectives: *To determine the age, gender, the culprit tooth involved and the most common primary facial space involved in odontogenic infections.*

Materials and Methods: *A descriptive cross sectional study was undertaken in Department of Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar from 1st May 2010 to 30 April 2011. This study was carried out on 155 patients with primary facial space infections of odontogenic origin. Data regarding age, gender, primary facial space involvement, culprit tooth and presenting signs was collected through history, clinical examination and radiographs.*

Results: *The patients with primary facial infections of odontogenic origin showed a male to female ratio of 1:1.87. The mean age was 33.77±13.45 years. Most of the patients were in the 3rd decade (34.83%) of life. Mandibular second permanent molars were the most common teeth involved in odontogenic infections (37.42%) followed by maxillary first molars (19.35%). The most common primary facial space involved was submandibular space (46.45%) followed by buccal space (30.32%). All of these patients with odontogenic infections of the primary facial spaces presented clinically with pain and swelling.*

Conclusion: *Odontogenic primary facial space infections were more common in females and in the third decade of life. The most common teeth involved in infections of the primary fascial spaces were permanent second molars. The submandibular space was the most common space involved in odontogenic infections. Pain and swelling were the common presentations of fascial space infections.*

Key Words: *Odontogenic infections, Molar teeth, Submandibular Space, Primary facial space.*

INTRODUCTION

Odontogenic infection is the most prevalent disease worldwide and is the principle reason for seeking dental care. The commonest odontogenic infections are periapical abscess, pericoronitis and periodontal abscess[1]. These infections are a public health concern and are most common in under-served patients lacking access to health care, who often obtain their health care through the emergency room of a publically funded hospital[2].

Spreading odontogenic infections are the most common type of serious oro-facial infections encountered by oral and maxillofacial surgeons. These infections represent the transformation from a localized dentoalveolar infection; usually a periradicular abscess to a destructive infection that can spread rapidly through the tissue planes, resulting in significant incidence of mortality[3]. Infection from the original focus can spread along the tissue spaces and lead to facial cellulitis involving deeper fascial spaces. These spaces are bound by muscles, bones and actual facial layers. These spaces communicate with one another and therefore allow the spread of infection beyond a single space[4].

Facial spaces are potential spaces that are divided into primary and secondary on the basis of direct and indirect involvement from the original focus. The primary spaces associated with the maxilla are the canine, buccal and infratemporal spaces while those with the mandible are the submental, sublingual, submandibular and buccal spaces[5].

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The purpose of this study was to find out the different patterns of primary fascial space involvement due to odontogenic infections in patients visiting Khyber College of Dentistry, Peshawar. This study will not only help in determining the most common primary fascial space involvement with specific teeth but will also help in early recognition and management to prevent the morbidity and mortality associated with these infections. Furthermore it will also help the population to understand the importance of early consultation with an Oral and Maxillofacial surgeon.

METHODOLOGY

A descriptive (cross-sectional study) was undertaken in the Department of Oral and Maxillofacial Surgery at Khyber College of Dentistry, Peshawar over a period of one year from 1st May 2010 to 30th April 2011. A total of 155 patients with infections of primary fascial spaces of odontogenic origin irrespective of the age and sex were included in the study. Patients with infections of primary fascial spaces, of non-odontogenic origin e.g. sialadenitis, parotitis, foreign body etc were excluded from study.

After approval from the institutional ethical review committee, the data for this study was compiled from the indoor and outdoor patients fulfilling the inclusion criteria visiting the Department of Oral and Maxillofacial Surgery at Khyber College of Dentistry, Peshawar. Informed and written consent were taken from all patients on a specially designed proforma. A thorough history was taken which was followed by detailed clinical examination and necessary investigations were carried out. The diagnosis of primary space involvement was confirmed by extra oral and intra oral clinical examination. For the identification of the involved tooth, all patients were advised relevant radiographs e.g. periapical view and orthopantomograms (OPG).

The confounding variables for the study for e.g. sialedinitis, paroitis and foreign body etc were controlled by excluding them from the study on the basis of history, clinical and radiographic examination. The exclusion criterion was strictly followed to control bias in study. A specially designed proforma was used for the collection of data. The collected data was analyzed by SPSS version 17.0.

RESULTS

A total of 155 patients were recruited in the study. Females having odontogenic infections comparised 65.16% (n=101) while 34.84% of the sample (n=54) were males, with a male to female ratio of 1:1.87. The age of patients ranged from 5 to 70 years with the mean age of 33.77 ± 13.45 years. The frequency of odontogenic infections was the highest in the 3rd decade (34.83%) followed by 4th decade (25.81%) and 5th decade (19.35%) respectively. The details of the age distribution are given in Table 1.

The most common teeth involved were permanent mandibular second molars (37.42%), followed by permanent maxillary first molars (19.35%), while permanent mandibular third molars were the third most common involved teeth (14.84%). The details of teeth involved are given in Table 2.

Submandibular space was the most common primary space involved (46.45%) followed by buccal space (30.32%). In multiple space involvement submandibular and sublingual were involved in 3.87% cases. It is worth mentioning here that not a single case of isolated submental space involvement was seen in this study. Details of the space involvement are given in Table 3. In this study all the patients reported with pain and swelling (100%) followed by dysphagia (61.29%). Trismus and pus discharge were present in 54.83% and 21.93% respectively.

Table 1: Age Distribution of Patients with primary facial space infections

Age in years	n	%
1-10	10	6.45
11-20	10	6.45
21-30	54	34.83
31-40	40	25.81
41-50	30	19.35
51-60	05	3.22
61-70	06	3.87
Total	**155**	**100**

Table 2: Teeth involvement in odontogenic infections

Tooth involved	n	%
Mandibular 2nd permanent molar	58	37.42
Maxillary 1st permanent molar	30	19.35
Mandibular 3rd molar	23	14.84
Mandibular 1st permanent molar	16	10.32
Maxillary 2nd permanent molar	10	6.45
Maxillary permanent canine	07	4.52
Maxillary 2nd primary molar	05	3.22
Maxillary 1st permanent premolar	03	1.93
Maxillary 3rd permanent molar	03	1.93
Total	**155**	**100**

Table 3: Primary fascial space involvement

Primary facial space	n	%
Submandibular	72	46.45
Buccal	47	30.32
Sublingual	11	7.09
Canine	10	6.45
Submandibular+Sublingual	6	3.87
Submandibular+Submental	5	3.22
Submandibular+Sublingual+Submental	3	1.93
Infratemporal	1	0.64
Total	**155**	**100**

DISCUSSION

The term maxillofacial facial space infection refers to infections in the potential spaces and facial planes of the maxillofacial region, a region with a complex anatomy[6]. Infections in the head and neck region, which commonly arise from odontogenic tissues, should be handled with every sense of urgency; otherwise, within a short time, they will result in acute emergencies. This is because of the many interconnected spaces, which enhances the fast spread of inflammation in the region[7]. The incidence of maxillofacial facial space infections has decreased significantly following the widespread use of broad-spectrum antibiotics and improved dental care. However, these infections remain potentially lethal because of the possibility of life-threatening complications e.g. respiratory obstruction, necrotizing fasciitis, descending mediastinitis, pericarditis, artery rupture, brain abscess and sepsis[8].

In the present study, 65.16% of females and 34.84% of males had odontogenic infections with male to female ratio 1:1.87. Rehman et al[9] reported in his study that 63.1% males and 36.9% females had odontogenic infections with male to female ratio of 1.7:1. In another study by Poeschl et al[10] males were predominant, having primary facial space infections more than females with the ratio of 1.4:1. The female predominance in the present study may be due to their high pain threshold, socioeconomic reasons and cultural restrictions where people have reservation to take their females patients to the dentist in this part of world.

In the present study, the age of patients varied from 5 to 70 years with mean age 33.77 years. Rega et al[11] studied 103 patients with facial space infections with an age range of 7 to 93 years with mean age of 33.3 years. Lee et al[12], found that odontogenic infections were in the age range of 1 to 89 years with mean age of 33.4 years. Sueharaet al[13], studied facial space infections and found that the mean age was 37.6 years. All these studies correlate well with our findings.

The frequency of odontogenic infections was high in the 3rd decade followed by 4th decade. The least involved age group in our sample of patients was 6th and 7th decades of life, reason being that most of the population in this part of the world is either edentulous or having lost most of their posterior teeth. Rehmann et al[9] studied odontogenic infections and found that these infections occurred most commonly in the 3rd decade followed by 4th decade. Seuhara et al[13] observed that most of the patients with facial space infections presented in the 3rd decade followed by 5th and 4th decade. These findings are also consistent with the present study.

Children were found to have comparatively less incidence of infection of the primary facial spaces because the erupting permanent teeth resorb their roots making their length short. That is why primary teeth usually present odontogenic infection in the form of a gum boil rather than spreading to the fascial spaces. In the present study the most common teeth involved in facial space infections were mandibular second permanent molars (37.42%) followed

by maxillary first permanent molars (19.35%). In a study by Store et al[14], the mandibular third molars were involved in (28.33%) and mandibular second molars in (20.42%) of cases. Flyn et al[15] reported in their study that the mandibular third molars were the most common culprit for facial space infections and accounted for (68%) of the cases followed by other posterior teeth including first and second mandibular molars in (19%) of the cases. The reason may be that most of the patients in the present study had impacted mandibular third molar which were mesioangular. This angulation favored food accumulation distal to the lower second molar which is very difficult to clean resulting in caries of the distal surface of the lower second molar tooth.

In the present study the most common primary space involved was the submandibular space (46.45%) followed by the buccal space (30.32%). The lower molars, primarily second and third molars have roots which are below the attachment of mylohyoid muscle, and the lingual cortical plate is thinner as compared to buccal cortical plate. Odontogenic infections from these teeth will perforate the lingual cortical plate in most cases, resulting in submandibular facial space infection. Infections from maxillary molar teeth and mandibular first molar will result in buccal facial space infection. The roots of permanent maxillary molars are above the attachment of buccinator muscle while the roots of mandibular permanent first molar are below the attachment of buccinator muscle. In the maxilla the buccal cortical plate is thinner than the palatal plate and fenestration in the buccal cortical plate favors the spread of infection to the buccal space. Rega et al[11] in his study reported that submandibular space was involved in 30% cases followed by buccal space which was involved in 27.5% cases. A different pattern was observed by Bridgeman et al[16], where buccal space (52.6%) was the most common space followed by submandibular space (24%). Labriolaet al[17] reported 24% of their patients presented with submandibular space infections and 20% with buccal space infections.

In the present study all patients presented with pain and swelling followed by dysphagia (61.29%). Pus discharge was observed in 21.94% cases, while trismus was present in 12% cases. In a similar study by Uluibau et al[18] reported that pain and swelling were observed in 100% of cases, while trismus was present in 44% cases. Rehmann et al[9] reported that most of the patients with odontogenic infections presented with pain (47.4%) followed by pus discharge (16.9%) and trismus (13%). These findings are consistent with the present study.

CONCLUSIONS

From this study it was concluded that:

1- Females were having more odontogenic infections and these infections were more common in the third decade of life.

2- The most common teeth involved in infections of the primary fascial spaces were permanent second molars.

3- Submandibular space was the most common space involved in odontogenic infections.

4- Pain, swelling, dysphagia, pus discharge and trismus were the most common presentations of fascial space infections.

RECOMMENDATIONS

1- The general population should be educated about the importance of oral hygiene and routine dental check up by the dentists.

2- Dental treatment is very expensive and m most of our population is poor. They cannot afford expenses attached to dental treatment. Our Government should pay attention to this issue.

3- Impacted lower third molar teeth should be prophylactically removed, because the area between these teeth and lower second molars is difficult to clean which leads to caries of the distal surface of the lower second molars and its associated sequale.

4- Patients reporting with swelling, pain, trismus and dysphagia in the maxillofacial region should be referred to maxillofacial surgeon as early as possible in order to avoid complications.

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