

Original Article

THE FREQUENCY, PATTERN, AND OUTCOME OF DISTAL CERVICAL CARIES OF MANDIBULAR SECOND MOLAR ASSOCIATED WITH IMPACTED MANDIBULAR THIRD MOLAR

*Muhammad Asif Khan, **Adnan Khan, ***Abdul Nasir, Noorulain, ****Hoor Ali

*Department of Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar.

ABSTRACT

Objective: To determine the frequency, pattern, and outcome of distal cervical caries of mandibular second molar associated with an impacted mandibular third molar.

Material and Methods: This prospective study was performed in the oral and maxillofacial surgery department, Khyber College of Dentistry Peshawar from 1st August 2017 to 31st December 2017. Using a Consecutive sampling technique, a total of 200 patients were reviewed. Patients with age 17 to 60 years with a mean age of 26.5 years and patients from both gender s were included in the study. Medically compromised patients were excluded from the study.

Results: Out of total 200 patients the frequency of distal cervical caries of mandibular 2nd molar (M2) was 46.5% (n=93). Maximum cases of distal cervical caries(DCC) of mandibular second molar (M2) were reported with mesioangular, Depth A, Class 1 mandibular third molar impaction and when the occlusal surface of the impacted mandibular third molar impaction was contacting at the cervical line of an impacted tooth. Males were more affected than female (M: F 1.6:1). The third decade of life was the most common age group affected the most (28%).

Conclusion: Prophylactic removal of impacted mandibular third molar is indicated in patients having impacted mandibular third molar with mesioangular, depth A, class 1, contacting at the cervical line of a second mandibular molar.

Keywords: Distal cervical caries of a mandibular second molar; the pattern of mandibular third molar impaction; prophylactic removal of impacted third molar impaction.

INTRODUCTION

Teeth that fail to erupt in the dental arch within the expected time of their eruption are said to be impacted¹. Common causes of mandibular third molar impaction are lack of space in the arch, increased density of the overlying bone, hindrance by adjacent tooth, retained deciduous tooth or broken down root (BDR), Supernumerary tooth, Odontomas, increased the thickness of the overlying mucosa, and genetically predisposition, or without no apparent etiology (idiopathic)².

The common disease process associated with M3 impaction is Pericoronitis, fascial space infection, dental caries and periodontal bone loss of the second molar, Cysts, and tumors. Such symptomatic impacted M3 teeth are removed³. Another situation for impacted M3 removal when it is removed Prophylactically without any local disease and that is when a partially erupted M3 is removed in anticipation of causing Pericoronitis (may lead to osteomyelitis), periodontal disease and distal cervical caries (DCC) of M2 or weakening of the mandibular angle^{4,5}. Prophylactic removal of anterior teeth crowding is not justified⁵.

Humans have the highest frequency of M3 impaction⁵. Pell and Gregory classifies M3 impaction on the basis of angulation i.e. Mesioangular, horizontal, vertical and distoangular; on the basis of depth, "A"

Correspondence:

Dr. Muhammad Asif Khan

Demonstrator, Department of Oral & Maxillofacial Surgery

Khyber College of Dentistry, Peshawar

Cell: 0321-9093036

Email address: drasifk@hotmail.com

depth when the occlusal surface of impacted M3 is at the level of occlusal surface of M2, depth "B" when it is between the occlusal surface and cervical line of M2, and depth C when it is below the cervical line of M2. Based on the amount of tooth covered by the anterior border of the ramus, Class I is situated anterior to the anterior border of the ramus; in Class II Crown half covered by the anterior border of the ramus. Class III when Crown is fully covered by the anterior border of the ramus⁵.

Eruption time of M3 is between the ages of 17 and 21 years⁶, Documented complications associated with M3 removal are a pain, swelling, trismus, infection, dry socket (alveolar osteitis), and anesthesia of the inferior alveolar nerve and the lingual nerve, temporomandibular joint injury and even mandibular fracture⁷. The rate of complications is decreased with a proper preoperative workup, profound local anesthesia, properly designed surgical flaps and atraumatic surgery⁸.

Periodontal bone loss and DCC of M2 are the common complications associated with 3rd molar impaction⁴. Angulation, depth, amount of bone covering and point of contact of impacted M3 with M2 are the key factors in the development of DCC of M2¹⁹. Distal cervical caries in the second molar usually develops due to mesioangular impaction¹². De Costa indicates the prophylactic extraction of third molars for the prevention of caries on the distal surface of the second molars⁴.

There is scarce of study on DCC of M2 caused by impacted M3 in both national and international literature. So this study was carried out to determine the frequency of DCC of M2, to find out the most common pattern of M3 impactions causing these caries and also to devise strategies for the prevention and management of these lesions.

MATERIAL AND METHODS

This prospective study was performed in the Khyber College of Dentistry(KCD) Peshawar from 1st August 2017 to 31st December 2017. Approval was taken from the ethical committee of KCD. A total of 200 patients with M3 impaction were reviewed both clinically and radiologically utilizing consecutive sampling technique. The pattern of impactions including angulation, depth, and Class and contact point with M2 were recorded. The extent of DCC of M2 was also recorded. Patients were sent to Operative

department Khyber college of dentistry for an expert opinion regarding management of the distal caries of M2. The treatment recommended for M2 caries by the operative department KCD was noted. These patients were called for the extraction of the impacted teeth as well as restoration/extraction of M2, where indicated. and also for the removal of M2 where advised. A written Informed consent was obtained from all patients. Patients were seated comfortably in the dental unit, and 3rd molars were removed atraumatically. Proper instructions and medications were advised to these patients and were resent to the operative department of KCD for appropriate treatment of DCC of M2. Data regarding M3 impaction pattern and associated DCC of M2 was recorded and was analyzed by SPSS Version 20.

RESULTS

A total of 200 patients were included in this study. Age range of the patients reviewed was 17 to 60 years with a mean age of 26.5 years. Out of these 200 patients mostly 55% (n=110) were males and 45% (n=90) were females. Mesioangular impaction was the most common pattern 47% (n=94) followed by horizontal impaction 28.5% (n=57), vertical 20% (n=40), and distoangular 4.5% (n=9) respectively. Regarding depth, 76% (n=152) had depth A, 22% (n=40) had depth B, and 2% (n=4) were with depth C. On the basis of class, 76% (n=152) were class 1, class 2 pattern was seen in 23% (n=46), and 1% (n=2) M3 impactions were Class 3. The occlusal surface of the mesioangular impacted M3 with M2 was found at cervical line in 54% (n=108), below cervical line 12% (n=24), and above cervical line 11% (n=22).

The total frequency of DCC of M2 was recorded as 46.5% (n=93) out of 200 patients. The third decade of life was the most common age affected by DCC associated with M3 impaction, i.e., 28% (n=56). Male to female ratio of DCC associated with impacted teeth was 1.6:1. The frequency of DCC associated with mesioangular impaction was 35.5% (n=71), followed by horizontal 10% (n=20), vertical 1% (n=2) and no caries were reported with distoangular pattern of impaction (table 1). Depth 'A' had 40% (n=80) of DCC, followed by Depth 'B' with 6.5% (n=13) and no distal caries was seen in case of Depth 'C' level of M3 impaction (table 2). Class 1 impaction was associated with 41.5% (n=83) of DCC, followed by Class 2 with 5% (n=10) and no caries of M2 was seen in Class 3 impaction cases (table

3). 43% (n=76) of DCC of M2 associated with M3 impaction was recorded in our study when the occlusal surface of impacted M3 was contacting the cervical line (cemento-enamel junction) of M2, followed by 5% (10 cases) when this contact was above and 3.5% (7 cases) when below the cervical line (table 4). Among affected M2, 26% (n=53) were restored with filling and 12.5% (n=25) by root canal treatment (RCT), 7.5% (n=15) carious M2 were extracted.

Table 1. effects of angulation of M3 impaction on DCC of M2

Angulation	Frequency of M2	Percent
Mesioangular	71	35.5%
Horizontal	20	10%
Vertical	2	1%
Distoangular	0	0%
Total	93	46.5%

Table 2. Effects of depth on DCC of M2

Depth	The Frequency of Dcc	Percent
A	80	40%
B	13	6.5%
C	0	0%
Total	93	46.5%

Table 3. Effects of Class on DCC of M2

Depth	The Frequency of Dcc	Percent
1	83	41.5%
2	10	5%
3	0	3.5%
Total	93	46.5%

Table 4. Effects of point of contact of occlusal surface of impacted M3 on M2

Contact	No. of DCC	Percent
At cervical line	76	38%
Above cervical line	10	5%
Bellow the cervical line	7	3.5%
Total	93	46.5%

DISCUSSION:

Mandibular third molar (M3) is said to be impacted when it doesn't erupt in the mouth to occupy a functional and occlusal position in the dental arch. Eruption time of M3 in the mouth is 14 to 21 years 10. Lack of space, a hindrance to eruption process and genetical predisposition are the main causes of

M3 impaction¹³. Manofy complications associated with M3 impaction have been reported in national and international journals including periodontal bone loss, root resorption and DCC of M2 4.

Two hundred patients with M3 impactions and DCC of M2 were reviewed both clinically and radiologically (periapical and orthopantomography). The total frequency of M3 impaction was 55% (n=110) in males and 45% (n=90) in females, the results are in contrary to that of Bashir S, et al⁶. Where females had more frequency of M3 impaction than males, i.e., 55% in females and 45% females.

The second decade of life was the commonest age affected with M3 impaction in our study. Our this result is similar to the study by Srivastava N. et. Al. 11

Mesioangular impaction was the most common angulation 47% (n=94), followed by horizontal impaction 28.5% (n=57), vertical 20% (n=40), and distoangular 4.5% (n=9) in our study which is almost similar to Srivastava's results but different from that of Hashemipour⁵ et al. where Vertical was (38%), Mesioangular (43%), Horizontal (3%), Distoangular (6%) .Majority of the patients presented with Class IA (76%) and IIIC was the least common (2%) in our in our study which are different from the study by Hashemipour. et al. 5, where Class IIA (44%) was the commonest position of impacted M3 reported. The occlusal contact of the mesioangular impacted M3 with M2 was found at the cervical line of M2 in 54% (n=108) below cervical line 12% (n=24) and above cervical line 11% (n=22) in our study.

The total frequency of DCC was 46.5% (n=93) in our study, higher than the results by Toedting et al. (38%) 15 and that of Falci et al. 20, i.e., 13.4%.

The third decade of life was the most common age affected with DCC associated with M3 impaction i.e. 28% (n=56) in our study, same as in the study by Toedling et al¹⁵.

Mesioangular angulation was the most common pattern of M3 impaction associated with DCC of M2 (35.5), same as reported by McArdle et al.¹²

Depth 'A' had 40% (n=80) of DCC, followed by Depth 'B' with 6.5% (n=13) and no distal caries was seen in case of Depth 'C' level of M3 Impaction, the result was less than that of McArdle's results (60% for depth A). Class-I impaction was associated with 41.5% (n=83), followed by Class II with 5% (n=10)

and no caries of M2 was seen in Class III impaction cases in contrast to other study where reported values were 45.8% in Class I, 43.7% in Class II, and 10.5% in Class III, respectively 12 .

43% (n=76) of DCC of M2 associated with M3 impaction was recorded in our study when the occlusal surface of impacted M3 was contacting the cervical line (cemento-enamel junction) of M2, in contrary to the study by Toedtling et al¹⁵ where higher incidence was reported when this contact was below the cervical line of M2, followed by 5% (10 cases) when this contact was above and 3.5% (7 cases) when this contact was at the cervical line of M2.

Among affected M2, 26% (n=53) were restored with filling and 12.5% (n=25) by root canal treatment (RCT) and 7.5% (n=15) carious M2 were extracted. Our these results are different from Yadav et al. 18 results where only 2% carious M2 and from Toedtling et al.¹⁵ where 13% of M2 were extracted.

Impacted mandibular 3rd molars were removed in all cases prophylactically, as was performed by Yadav et al. 18 in their study.

CONCLUSION:

Distal cervical caries of M2 are most commonly associated with Mesioangular, Depth A, Class I M3 impaction and when the occlusal surface of impacted M3 was contacting at the cervical line of M2. Treatment of DCC of M2 is the prophylactic removal of impacted M3 and restoration and /removal of carious M2 as well.

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