

# ASSOCIATION BETWEEN DISTAL DECAY IN SECOND MOLAR AND IMPACTED MANDIBULAR THIRD MOLARS: A retrospective study

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## ABSTRACT:

Lower third molars are the most common impacted teeth encountered in clinical practice. There are various pathologies associated with the impacted tooth such as root resorption, distal caries of the adjacent tooth, cyst formation, periapical radiolucency and osteitis. One of the biggest dilemma faced by clinicians is the prophylactic extraction of the impacted third molar as it can lead to potential pathological complications.

**KEYWORD:** impaction, lower third molar, distal caries

## INTRODUCTION:

According to Archer, impacted tooth is the tooth that is partially or completely unerupted and is positioned against another tooth or bone or soft tissue so that its further eruption is unlikely, described according to its anatomic position.<sup>1</sup> Various studies in literature reported mandibular third molars to have a greater incidence of impaction as compared to the maxillary third molars.

Impacted teeth are generally associated with numerous pathologies and one such pathology is distal caries which grossly affects the adjacent teeth i.e., second molar. Partially erupted mesioangular or horizontally impacted mandibular third molars that contact the second molars' amelocemental junction risk the second molar teeth for distal cervical caries.<sup>3-5</sup> The relationship of mandibular third molar with the second molar results in exposure of the distal root surface of the second molar to the oral environment. McArdle WL et al<sup>6</sup> suggested the current practice of extraction of impacted third molars to be indicated only if they cause diseases. According to various studies, second molars are more prone to distal caries due to the pressure exerted by the impacted third molars which require either restorations or extractions. Hence, an additional procedure along with the surgical extraction of the impacted third molar is required for management of such conditions. Depending upon the angulation of the impacted mandibular teeth such as mesioangular and horizontally impacted teeth, plaque tends to accumulate against the second molar's distal surface, thereby predisposing to cervical distal caries.<sup>5</sup> The study attempts to radiographically assess the change in distal surface of

second molar (radiolucency) suggestive of decayed condition of the tooth and its prevalence with the presence of impacted third molar.

## MATERIAL AND METHOD

A total of 200 OPG xrays with impacted lower third molars (187 lower left third molars and 179 lower right third molars) were screened from the patients' record who had reported to the Department of Oral and Maxillofacial Surgery in the last two years (2020-2022). The OPG xrays were studied to evaluate the presence of radiolucency in the coronal or radicular portion in the distal aspect of the second molar which would be suggestive of decay in the presence of impacted third molar. The variables evaluated in this study were gender, incidence of distal decay in second molar, different angulation, positions and classes of impacted lower third molar teeth, based on Winter's classification, and Pell and Gregory classification (Table 1, Table 2 and Table 3). The prevalence of distal decay associated with second molars were tabulated for different angulation, position and class of lower impacted third molar for both the sides.

**Table 1: Incidence of distal caries in relation to lower third molar:**

SL NO.	ANGULATION	38 (%)	48 (%)
1.	VERTICAL	10/73 (13.6%)	16/72 (22.2%)
2.	MESIOANGULAR	14/86 (16.2%)	24/78 (30.7%)
3.	DISTOANGULAR	0/3 (0%)	1/6(16%)
4.	HORIZONTAL	3/25(12%)	6/23 (21.7%)

**Table 2: Incidence of distal caries in relation to position of mandibular impacted 3<sup>rd</sup> molar according to Pell and Gregory**

SL NO.	POSITION	38(%)	48(%)
1.	A	0/144(0)	16/142(11.2)
2.	B	3/33 (9)	7/24 (29)
3.	C	0/10 (0)	0/13 (0)

**Table 3: Incidence of distal caries in relation to class of mandibular impacted 3<sup>rd</sup> molar according to Pell and Gregory**

SL NO.	CLASS	38(%)	48(%)
1.	I	0/115 (0)	11/107(10.2)
2.	II	3/55 (5.4)	10/50 (20)
3.	III	0/17 (0)	2/22 (9)

**RESULTS**

Out of 200 pre-operative radiographs of the patients presenting with third molar impactions from the year 2020- 2022, we observed a male predilection in the total collected data of population (104 male, 96 female). The incidence of distal caries was highest in the mesioangular lower right third molars with the prevalence of 30% (Table 1) whereas the highest incidence for the same was most prevalent in the position B and class II (Table 2 and Table 3). No incidence of distal caries were found in the position C third molars, whereas one case with distoangular was reported out of 9 distoangular cases.

**DISCUSSION**

Previous studies indicated that the prevalence of second molar caries associated with lower impacted third molar ranges from 7 to 32%.<sup>10-12</sup> But higher incidence was reported by Kang et al (52%) probably due to the use of CBCT.<sup>13</sup> Variations in the eruption time of the third molar was reported in different races.

Our study was in accordance with the study conducted by Pepper T et al, in which out of 133 mesioangular third molars 22 cases had distal caries.<sup>14</sup> The results of our study can be correlated with another study conducted by Syed BK et al, in which 377 out of 979 patients developed distal caries in the second molars. They concluded that 39% of patients had distal caries in second molar in relation to mesioangular impaction whereas the incidence of distal caries in distoangular impaction was only 3.4%<sup>15</sup>.

Similar study conducted by Marques J et al concluded that contact points at or below the CEJ are more prone to plaque accumulation as maintaining oral hygiene in the proximal area becomes difficult. A high prevalence was noted with Horizontal or mesioangular lower third molars (20.6% to 30.2%), hence they advised prophylactic removal of the lower third molars.<sup>16</sup>

Our study emphasizes on diligent examination, oral diagnosis and patient counselling during primary visit to the hospital and also the prophylactic removal of third molar as it has the tendency to associate with various pathologies.

## CONCLUSION

With this study, we can conclude that mesioangular type of impaction leads to distal proximal caries in almost 30% of the cases, whereas Class II Position B (Pell and Gregory classification) third molars lead to 29% of distal proximal caries. Most of the impacted third molar play an important role in mastication, bearing occlusal load<sup>10</sup> hence, early prophylactic extraction of impacted third molar becomes the prime treatment modality as it prevents the patient with rehabilitation cost of second molar since most of the crown structure is lost due to cervical caries.

## BIBLIOGRAPHY

1. William HA. Oral and Maxillofacial Surgery. 5th ed. Philadelphia, PA: WB Saunders; 1975.p. 1859
2. Son Hoang Le, Nhut Minh Nguyen, Ngoc Thi-Bao Nguyen, and Ly Thi-Bich Nguyen. Anatomical Positions of Mesially/Horizontally Impacted Mandibular Third Molars are Significant Predictors for Distal Caries in Adjacent Second Molars. *Int J Dent*. 2022; 2022:1-6.
3. Van der Linden W, Cleaton-Jones P, Lownie M. Diseases and lesions associated with third molars. Review of 1001 cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1995; 79: 142–5.
4. Current clinical practice and parameters of care: the management of patients with third molar teeth. Faculty of Dental Surgery of the Royal College of Surgeons of England; September 1997.
5. Knutsson K, Brehmer B, Lysell L, Rohlin M. Pathoses associated with mandibular third molars subjected to removal. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1996; 82:10–7.
6. McArdle LW, Renton TF. Distal cervical caries in the mandibular second molar: an indication for the prophylactic removal of the third molar? *Br J Oral Maxillofac Surg* 2006; 44: 42-5.
7. Chu FC, Li TK, Lui VK, Newsome PR, Chow RL, Cheung LK. Prevalence of impacted teeth and associated pathologies- A radiographic study of the Hong Kong Chinese population. *Hong Kong Med J*. 2003;9(3):158-63
8. Quek SL, Tay CK, Tay KH, Toh SL, Lim KC. Pattern of third molar impaction in a Singapore Chinese population: A retrospective radiographic survey. *Int J Oral Maxillofac Surg* 2003; 32:548-52.

9. Pahkala R, Pahkala A, Laine T. Eruption pattern of permanent teeth in a rural community in northeastern Finland. *Acta Odontol Scand.* 1991; 49:341-9.
  10. Polat HB, Ozan F, Kara I, Ozdemir H, Ay S. Prevalence of commonly found pathoses associated with mandibular impacted third molars based on panoramic radiographs in Turkish population. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2008; 105: 41-7.
  11. Al-Khateeb TH, Bataineh AB. Pathology Associated with impacted mandibular third molars in a group of Jordanians. *J Oral Maxillofac Surg.* 2006; 64: 1598-602.
  12. Ozeç I, Herguner Siso S, Tasdemir U, Ezirganli S, Goktolga G. Prevalence and factors affecting the formation of second molar distal caries in a Turkish population. *Int J Oral Maxillofac Surg.* 2009; 38: 1279-82.
  13. Kang F, Huang C, Sah MK, Jiang B. Effect of eruption status of the mandibular third molar on distal caries in the adjacent second molar. *J Oral Maxillofac Surg.* 2016; 74: 684-92.
  14. Pepper T, Gimshaw. P konarzewski T. Combes J. Retrospective analysis of prevalence and incidence of caries in the distal surface of mandibular second molar in British military personnel. *Br J Oral Maxillofac Surg* 2017; 55(2): 160-163.
  15. Syed KB, Alshahrani FS, Alabsi WS, Alqahtani ZA, Hameed MS, Mustafa AB, Alam T. Prevalence of Distal Caries in Mandibular Second Molar Due to Impacted Third Molar. *J Clin Diagn Res.* 2017 Mar; 11(3):ZC28-ZC30.
- Marques J, Montserrat-Bosch M, Figueiredo R, Vilchez-Pérez MA, Valmaseda-Castellón E, Gay-Escoda C. Impacted lower third molars and distal caries in the mandibular second molar. Is prophylactic removal of lower third molars justified? *J Clin Exp Dent.* 2017 Jun 1; 9(6): e794-e798.