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# Association of the Mandibular Third Molar Position to the Pericoronitis

Tsvetan Tsvetanov\*

Department of Oral Surgery, Dental Faculty, Medical University-Plovdiv, Bulgaria \*Corresponding e-mail: <u>doctorcvetanov@abv.bg</u>

## ABSTRACT

Introduction: Pericoronitis is inflammation of the soft tissues surrounding the crown of a partially erupted tooth. **Objective:** To provide measurement of lower third molar angulation and determine relationship between mandibular third molar position and presence of pericoronitis. **Material and methods:** We studied 104 patients with lower third molar pericoronitis with clinical manifestations and measurement of lower third molar angulation. The mean age of patients was 25.7 years (range 18-35 years). **Results:** In this study was used the following statistical analysis, Pearson correlation coefficient and Spearman's correlation coefficient (nonparametric version of the Pearson correlation coefficient) for measure of the linear correlation between two variables - pericoronitis and angulation of the lower third molars. The chi-square test was used to assesses case incidences. The level of significance was p<0.05. 36.04% of partially impacted mandibular third molars were mesioangular followed by the vertical (25.47%), horizontal (18.97%), distoangular (9.21%), buccal (5.42%) and lingual (3.79%) position. The lowest part of the mandibular third molars is located in the ramus of mandible (1.08%). The present study was found in relation to mesioangular, distoangular, vertical impaction and pericoronitis (p<0.05). **Conclusion:** We conclude that the position of lower third molar may be able to be associated with presence of pericoronitis.

Keywords: Angulation, Distoangular, Lower third molar, Mesioangular, Pericoronitis, Position, Vertical

## INTRODUCTION

Pericoronitis, caries of adjacent teeth, external root resorption, dentigerous cyst, excessive bone loss, benign or malignant tumors are among the various pathologic conditions that are commonly associated with impacted or semi-impacted third molars. In many cases pericoronitis is associated with presence of paradental cyst (inflammatory odontogenic cyst usually associated with distal and buccal aspect of partially impacted mandibular third molars). Pericoronitis is one of the reason for extraction of permanent teeth and one of the condition could indicate the prophylactic extraction of impacted third molars (Figure 1) [1-3]. There are some forms of pericoronitis: acute serous pericoronitis, acute suppurative pericoronitis, chronic pericoronitis. Pain is usually the predominant symptom in acute stages, whereas chronic forms of the disease may display very few symptoms. Both present exudate. The infection is multimicrobial, predominantly caused strictly by beta lactamase-producing anaerobic microorganisms [4]. Pericoronitis is defined as inflammation of the oral soft tissues surrounding the crown of an erupted or partially erupted tooth. The word is often used in relation to inflammation of the operculum associated with the mandibular third molars as it is rarely diagnosed elsewhere. The prevalence of non-third molar related pericoronitis is the low. The most prevalence type is chronic pericoronitis affecting the lower right second permanent molar [5]. The peak age of occurrence of pericoronitis varied from 21 to 25 years (55.2% of the patients). The incidence of pericoronitis is highest in September (207 (9.6%)), followed by April [181 (5.2%), followed by October 97 (4.5%)] [6].

The soft tissues adjacent to vertically inclined, partially erupted mandibular third molars are more frequently affected by pericoronitis than teeth that are soft tissue impacted or erupted [7]. The vertical (28%) and distoangular (28%) impaction was more prevalent with relationship between the pericoronitis and status of impacted third molar, especially in vertical and distoangular position [8]. Clinical research over 411 patients with mandibular third molar pericoronitis showed that in relation to angulation and height, mandibular third molar most likely to be afflicted with pericoronitis is vertical eruption at occlusal plane of the second molar [9]. There is strong association between the pericoronitis and vertical angulation [10]. The majority of pericoronitis cases, 120 of 148 or 81.0%, involved vertically oriented

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## **Figure 1 Pericoronitis**

lower third molars, mesioangular impacted lower third molars accounted for only 11.2% of pericoronitis cases, remaining cases comprised distoangular and horizontally impacted lower third molars (3.4% and 3.8%, respectively). Involvement by impinging maxillary dentition was observed in 39.7% of the vertically oriented lower third molars, 56.2% of the mesioangular oriented lower third molars, 40.0% of the distoangular lower third molars, and 14.0% of the horizontally impacted lower third molars [11].

## MATERIAL AND METHODS

Our study was carried out at Medical University of Plovdiv, Faculty of Dental Medicine, Department of Oral Surgery. Total 1050 patients were included in our investigation with a mean age of 25.67 years within range of 7-83 years. We studied 104 patients with lower third molar pericoronitis with clinical manifestations and measurement of lower third molar angulation among investigated 1050 patients. All patients with clinical symptoms of pericoronitis were examined with a mouth mirror. Panoramic radiographs were also analyzed. The magnification was 25%. The clinical criteria for a diagnosis of pericoronitis was defined as pain, hyperemia, edema associated with the lower third molars.

## RESULTS

About 36.04% of partially impacted mandibular third molars were mesioangular followed by the vertical (25.47%), horizontal (18.97%), distoangular (9.21%), buccal (5.42%) and lingual (3.79%) position. The lowest part of the mandibular third molars is located in the ramus of mandible (1.08%) (Figures 2-7). Data were analyzed with the use of the program, Microsoft SPSS 11.0 (Windows) at Medical University of Plovdiv, Bulgaria, Department of Social Medicine and Public Health.



Figure 2 Mesioangular position

After obtaining angulation by radiological investigation, we used Pearson correlation coefficient and Spearman's correlation coefficient (nonparametric version of the Pearson correlation coefficient) to measure the linear correlation

assesses case incidences. The level of significance was p<0.05.

between two variables - pericoronitis and angulation of the lower third molars. The chi-square test was used to

**Figure 3 Vertical position** 



**Figure 4 Horizontal position** 

No significant relation was found between horizontal position and development of pericoronitis ( $X^2$ =0.641; df=1; Pearson correlation coefficient r=-0.025; Spearman's rank-order correlation r=-0.025; p=0.423; p>0.05). A statistically low significant relation was found in relation to pericoronitis and lower third molars in vertical position ( $X^2$ =28.254; df=1; Pearson correlation coefficient r=0.164; Spearman's correlation coefficient r=0.164; p=0.000; p<0.05). A statistically low significant relation was found in relation to pericoronitis and mesioangular impaction ( $X^2$ =18.444; df=1; Pearson correlation coefficient r=0.133; Spearman's rank-order correlation r=0.133; p=0.000; p<0.05). A statistically low significant relation was also found with distoangular third molar impaction and pericoronitis ( $X^2$ =14.983; df=1; Pearson correlation coefficient r=0.119; p=0.000; p<0.05).



Figure 5 Distoangular position



Figure 6 Buccal and lingual position



Figure 7 Mandibular third molars are located in the ramus of mandible

#### DISCUSSION

People in third decade showed the highest incidence of impacted third molars. Mesioangular impactions were the highest number of impacted mandibular third molars, followed by vertical, horizontal and distoangular angulation. Our study is similar to other investigations which determined that mesioangular impactions were the highest number of impacted mandibular third molars, followed by vertical, distoangular and horizontal angulation, pericoronitis was seen in 29.36% of patients mostly associated with distoangular, Position A or B, Class II molars [12-15]. Primo, Fabio T., et al. analyzed panoramic radiographs of 310 patients, 197 females and 113 males, totaling 1,211 third molars and determined that in the lower third molars, the most prevalent position is mesioangular (52.96%) [16]. Patel, Shital., et al. investigated retrospectively 1198 patients who underwent the surgical removal of impacted mandibular third molars and found that there was a high incidence of mesioangular lower third molar impaction (33.97%), highest number of patients were found in 15-30 years of age group (48.33%), a left side (56.93%) was more commonly involved, female predominance (63.44%) was observed and recurrent pericoronitis (33.81%) was the most common indication [17]. Our dates for high prevalence of mesioangular lower third molar impaction are difference from results of Al-Dajani, Mahmoud., et al. [18]. They investigated 1551 patients (60.8%) with a mean age of 33.5 years-old and determined that highest vertical impaction and higher impaction rate in mandible than maxilla. Vertical impaction is the most common pattern (1354 patients; 53.1%). Mesioangular impaction ranked second in mandible. Most of the authors considered that the highest risk for acute pericoronitis was found to be vertically positioned third molar; followed by distoangular and mesioangular impactions [7-11,19,20]. In the present study an association was found between mesioangular, distoangular, vertical impaction and pericoronitis. The results of the current study are in agreement with the results of studies by Indira, et al. They demonstrate an association between the pericoronitis and vertical, distoangular impaction [8]. Our study didn't find relationship between horizontal position and development of pericoronitis. Another study found association between the pericoronitis and horizontal position [11]. There is strong association between mesioangular position and development of pericoronitis [21,22].

#### CONCLUSION

Mandibular third molars are more commonly impacted than their maxillary counterparts and upper canines. Mesioangular impaction is the most common pattern, vertical impaction ranked second in mandible. Pericoronitis associated with lower third molar is commonly seen in third decade. In relation to angulation lower third molars most common to be affected from pericoronitis in vertical, mesioangular and distoangular eruption.

## DECLARATIONS

#### **Conflict of Interest**

The author denies any conflicts of interest related to this study.

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