

Current status of complications caused by mandibular third molars and their impact on patient's quality of life at Hai Phong Medical University Hospital

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ABSTRACT

Objectives: To describe the current status of complications caused by mandibular third molars among patients examining at Hai Phong University of Medicine and Pharmacy Hospital, and to evaluate the impact of these complications on the patients' quality of life. **Subjects and Methods:** A total of 97 patients with mandibular third molars were evaluated using clinical examination forms, and the 14-item Oral Health Impact Profile (OHIP-14) questionnaire. **Results:** The study sample comprised 97 patients with 185 mandibular third molars. The predominant eruption angulation was mesioangular, accounting for 38.9%. Female patients exhibited a higher complication rate (96.0%) compared to male patients (61.7%). Periodontal complications were observed in 131 teeth (70.81%), with 87.5% of mesioangular teeth exhibiting periodontal pathology. Horizontal impaction was the angulation most frequently associated with distal caries on the adjacent second molars (60.0% of horizontally impacted teeth caused second molar caries). Occlusal interference was reported in 16.76% of cases. Additionally, jaw cysts secondary to horizontal impactions were recorded in only two cases. Among the seven domains of the OHIP-14, physical pain was the most prevalent issue (2.3 ± 0.94), followed by functional limitation (0.5 ± 0.34). These impacts demonstrated statistically significant differences between the symptomatic and asymptomatic groups ($p < 0.05$). **Conclusions:** Complications associated with mandibular third molars are diverse, with periodontal complications and distal caries of the adjacent second molars being the most common. These complications adversely affect patients' quality of life, with physical pain being the most prominent impact.

Keywords: Third molar complications, OHIP-14

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INTRODUCTION

Wisdom teeth, or mandibular third molars, are the latest teeth to erupt and are positioned at the most distal end of the dental arch. Throughout human craniofacial evolution, a progressive reduction in jaw size has resulted in insufficient space for proper wisdom tooth eruption. This disproportion between arch length and tooth mass frequently leads to impaction or

maleruption, subsequently causing pain and various other oral pathologies.

Modern medicine consistently embraces a patient-centered approach, wherein oral health-related quality of life (OHRQoL) has become a primary focus for general clinicians and dental practitioners alike. The 49-item Oral Health Impact Profile (OHIP-49) was developed to provide an objective assessment of how oral health conditions compromise an individual's quality of life

[1]. As a shortened and refined version, the OHIP-14 instrument still comprehensively captures all dimensions of this impact and is currently widely utilized in quality-of-life research both in Vietnam and globally [2].

To gain a more objective insight into patients' psychological perceptions and experiences regarding the burdens imposed by mandibular third molars, specifically the prevalence of associated complications and their subsequent impacts on oral health-related quality of life, this study aims to achieve two specific objectives:

1. To describe the clinical status of complications caused by mandibular third molars among patients presenting to the Department of Odonto-Stomatology at Haiphong Medical University Hospital.
2. To evaluate the impact of these complications on the oral health-related quality of life within this patient cohort.

METHODS

Study subjects

Inclusion criteria

- Patients who voluntarily agree to participate in the study and provide informed consent.
- Patients who possess adequate capacity to independently complete the study questionnaire.
- Patients with at least one mandibular third molar that has not undergone prior dental intervention.

Exclusion criteria: Patients without any mandibular third molars.

Study setting and timeline

Study Setting: The study was conducted at the Department of Odonto-Stomatology, Haiphong Medical University Hospital.

Study Timeline: from 12/2025- 6/2026

Study design: Cross-sectional descriptive study

Sampling method

A convenience sampling method was employed. **Study variables and indicators**

Methods for assessing mandibular third molar eruption and position

This study primarily focuses on the clinical evaluation of mandibular third molar eruption status rather than assessing surgical difficulty. In this study, clinical examinations and periapical radiographs were utilized to determine the angulation of the mandibular third molars. Therefore, Winter's classification system was adopted, which defines the tooth position based on the angulation of the long axis of the third molar relative to the long axis of the adjacent second molar (the second permanent molar):

- Vertical: The long axis of the third molar is parallel to the long axis of the second molar.
- Mesioangular: The third molar is angulated mesially, tilting forward toward the second molar.

- Horizontal: The long axis of the third molar is horizontal (forming an approximate 90 degree angle relative to the second molar), with its crown directly impacting the root or crown of the second molar.

- Buccoverversion / Linguoverversion: The third molar is significantly displaced buccally (toward the cheek) or lingually (toward the tongue).

- Inverted: The tooth is positioned upside down, with the crown directed inferiorly (downward) and the roots pointing superiorly (upward).

Complications associated with mandibular third molars [3]

- Periodontal complications: May include the following conditions:

Pericoronitis

Alveolar bone loss distal to the third molar

Abscess and generalized cellulitis

Periodontal destruction of the adjacent tooth

- Dental caries of the second molar / tooth #7
- Occlusal interference : Occlusal discrepancies resulting in temporomandibular disorders (TMD), characterized by clinical signs such as: temporomandibular joint (TMJ) pain, joint clicking/crepitus during mouth opening, headaches, and facial muscle fatigue.
- Odontogenic cysts and tumors of the jaw.

OHIP-14 scoring and data analysis

The Oral Health Impact Profile (OHIP-14) responses were scored using a 5-point Likert scale (0 = never; 1 = hardly ever; 2 = occasionally; 3 = fairly often; 4 = very often). Data were analyzed using domain scores (the scores for each of the 7 conceptual domains (functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap) were calculated by summing the two

corresponding items (score range: 0-8 per domain) [2].

Data management and statistical analysis

All collected data were managed, processed, and analyzed using biostatistical methods via the SPSS software 26.0 package. Descriptive statistics were employed for categorical variables, with percentages calculated to describe the distribution of values within the study population. Statistical significance was set at a threshold of $p < 0.05$. Finally, the analyzed results were systematically presented using appropriate tables, charts, and descriptive commentaries.

Ethical considerations

The study protocol was reviewed and approved for implementation by the administration of Haiphong Medical University Hospital and the leadership of the Department of Odonto-Stomatology.

RESULTS

General characteristics of the study population

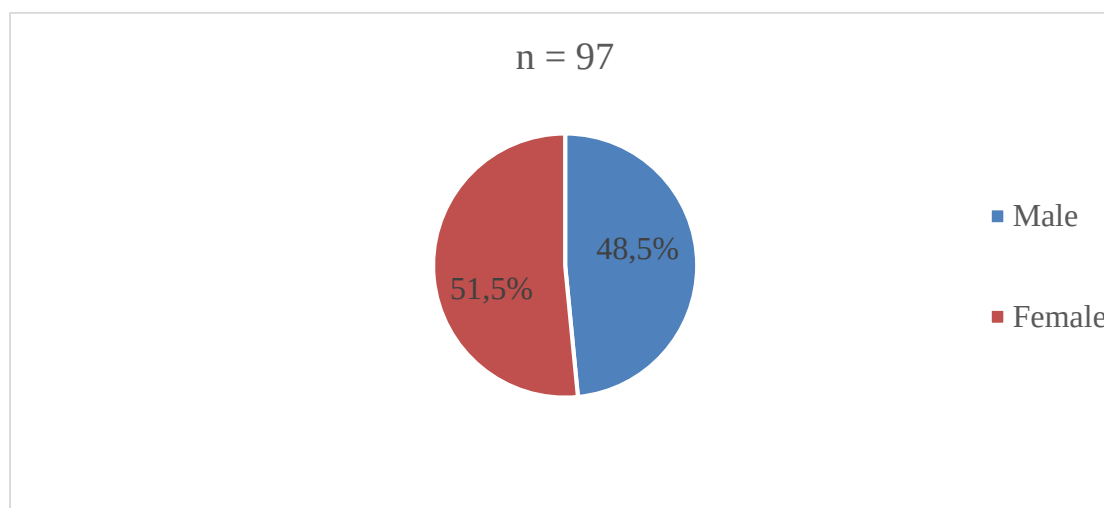


Figure 1. Gender Distribution

Commentary: The results indicated that the proportion of female participants was higher than that of males, at 51.5% and 48.5%, respectively. However, this gender distribution was relatively balanced, and the difference was not substantial.

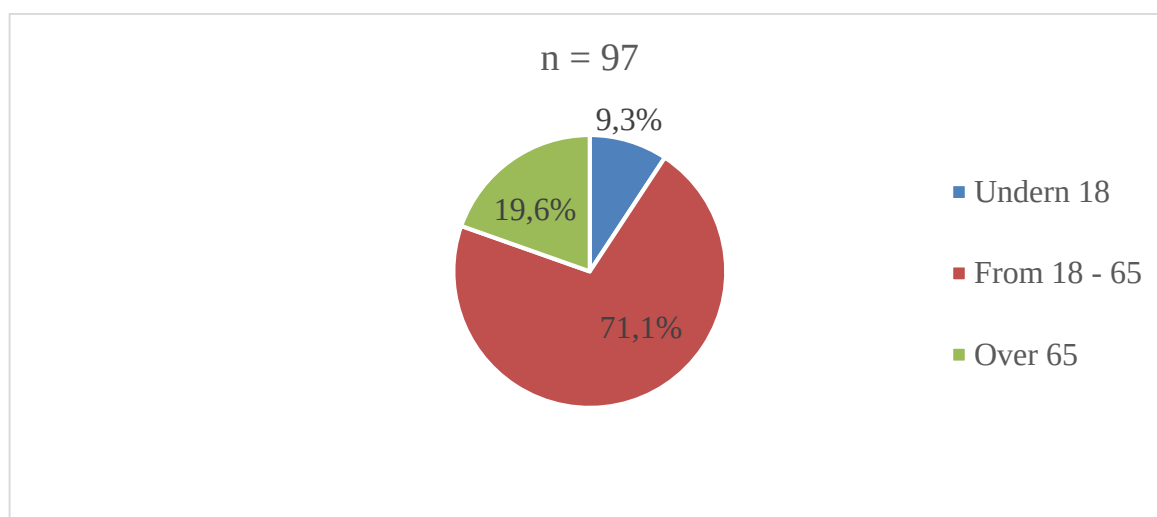


Figure 2. Age distribution

Commentary: Regarding the age distribution of the study population, the 18–65 age bracket constituted the largest cohort, accounting for 71.1% of the total sample.

Table 1. Distribution of third molars according to Winter's Classification

Tooth Angulation	n	%
Vertical	26	14
Mesioangular	72	38.9
Distoangular	12	6.4
Buccoversion / Linguoversion	30	16.3
Horizontal	45	24.4
Total	185	100%

Commentary: From the pool of 97 participants, a cumulative total of 185 mandibular third molars were identified and analyzed. In terms of tooth angulation, mesioangular orientation constituted the vast majority at 38.9%, while horizontal orientation represented 24.4% of the sample.

Current status of complications associated with mandibular third molars

Table 2. Prevalence of patients with at least one complication stratified by gender

	Symptomatic		Asymptomatic		Total		<i>p</i>
	n	%	n	%	n	%	
Male	29	61.70	18	38.30	47	48.5	<i>p</i> <0.001*
Female	48	96	2	4	50	51.5	
Total	77	79.38	20	20.62	97	100%	

*Fisher's Exact Test

Comentary: Out of the 97 investigated subjects, a significantly higher rate of third molar complications was observed in female patients (96.0%) compared to their male counterparts (61.7%)(*p* < 0.001, Fisher's Exact Test).

Table 3. Prevalence of periodontal complications stratified by third molar angulation

	Symptomatic		Asymptomatic		Total	
	n	%	n	%	n	%
Vertical	11	42.31	15	57.69	26	14
Mesioangular	63	87.50	9	12.50	72	38.9
Distoangular	6	50.00	6	50.00	12	6.4
Buccoversion / Linguoversion	18	60.00	12	40.00	30	16.3
Horizontal	33	73.33	12	26.67	45	24.4
Total	131	70.81	54	29.19	185	100%

Commentary: Regarding the 185 evaluated mandibular third molars, a high prevalence of periodontal complications was recorded, affecting 131 teeth (70.81%). The incidence of periodontal defects varied substantially across different tooth angulations, with mesioangular orientation being the most heavily affected cohort (87.5% of all mesioangular teeth developed periodontal complications). Horizontal impaction and buccoversion/linguoversion followed with complication rates of 73.33% and 60.0%, respectively.

Table 4. Prevalence of second molar caries stratified by third molar angulation

	Symptomatic		Asymptomatic		Total	
	n	%	n	%	n	%
Vertical	3	11.54	23	88.46	26	14
Mesioangular	33	45.83	39	54.17	72	38.9
Distoangular	1	8.33	11	91.67	12	6.4
Buccoversion / Linguoversion	5	16.67	25	83.33	30	16.3
Horizontal	27	60.00	18	40.00	45	24.4
Total	69	37.30	116	62.70	185	100%

Commentary: Regarding the 185 evaluated mandibular third molars, a substantial prevalence of third-molar-induced dental caries on the adjacent second molars was recorded, affecting 69 teeth (37.3%). The incidence of adjacent tooth decay varied significantly across different angulations; horizontally oriented third molars demonstrated the highest cariogenic propensity, with 60.0% of these teeth causing distal caries on the second molars.

Table 5. Prevalence of occlusal interference stratified by third molar angulation

	Symptomatic		Asymptomatic		Total	
	n	%	n	%	n	%
Vertical	15	57.69	11	42.31	26	14
Mesioangular	6	8.33	66	91.67	72	38.9
Distoangular	1	8.33	11	91.67	12	6.4
Buccoversion / Linguoversion	9	30.00	21	70.00	30	16.3
Horizontal	0	0.00	45	100.00	45	24.4
Total	31	16.76	154	83.24	185	100%

Commentary: In terms of functional occlusion, vertically oriented third molars demonstrated the highest propensity for inducing occlusal interference, affecting 57.69% of the teeth within

this cohort. Teeth positioned in buccoversion/linguoversion followed as the second most frequent cause, accounting for 30.00% of the respective sample.

Table 6. Prevalence of jaw cysts stratified by third molar angulation

	Symptomatic		Asymptomatic		Total	
	n	%	n	%	n	%
Vertical	0	0.00	26	100.00	26	14
Mesioangular	0	0.00	72	100.00	72	38.9
Distoangular	0	0.00	12	100.00	12	6.4
Buccoversion / Linguoversion	0	0.00	30	100.00	30	16.3
Horizontal	2	4.44	43	95.56	45	24.4
Total	2	1.08	183	98.92	185	100%

Commentary: Odontogenic jaw cysts represented an infrequent complication within the study population. Among the 185 evaluated mandibular third molars, only 2 instances (1.08%) of cyst formation were identified. Notably, both cases occurred exclusively within the horizontally oriented third molar cohort, representing an incidence rate of 4.44% within this specific angulation group.

Impact of mandibular third molar complications on patient quality of life (QoL)

Table 7. Mean OHIP-14 scores across seven domains

Domains	$\bar{X}$	<i>SD</i>	<i>Min</i>	<i>Max</i>
Functional Limitation	0.50	0.34	0	3
Physical Pain	2.30	0.94	0	5
Psychological Discomfort	0.22	0.31	0	2
Physical Disability	0.30	0.94	0	2
Psychological Disability	0.05	0.2	0	1
Social Disability	0	0	0	0
Handicap	0	0	0	0

Commentary: According to the aforementioned table, out of the seven OHIP-14 domains answered by the 97 study participants, physical pain emerged as the most predominant complaint, with a mean score of 2.3 ± 0.94 . Physical disability and functional limitation followed as secondary concerns, recording mean scores of 0.5 ± 0.34 and 0.3 ± 0.94 , respectively.

Table 8. Comparison of mean OHIP-14 scores across seven domains between patients with and without third molar complications

Domains	Symptomatic		Asymptomatic		Total		<i>p</i> *
	$\bar{X} \pm SD$	N	$\bar{X} \pm SD$	N	$\bar{X} \pm SD$	N	
Functional Limitation	0.8 ± 0.49	77	0.1 ± 0.15	20	0.5 ± 0.34	97	0.02
Physical Pain	3.1 ± 0.98	77	0.52 ± 0.59	20	2.3 ± 0.94	97	0.03
Psychological Discomfort	0.37 ± 0.43	77	0.03 ± 0.21	20	0.22 ± 0.31	97	0.15

Physical Disability	0.55 ± 0.53	77	0.13 ± 0.49	20	0.3 ± 0.94	97	0.45
Psychological Disability	0.12 ± 0.33	77	0.01 ± 0.07	20	0.05 ± 0.2	97	0.27
Social Disability	0	77	0	20	0	97	1
Handicap	0	77	0	20	0	97	1

*Test Mann-Whitney

Commentary: According to the findings, the mean score within the physical disability domain was significantly elevated in the complicated group compared to the uncomplicated group (0.8 ± 0.49 versus 0.1 ± 0.15), demonstrating a statistically significant disparity ($p < 0.05$). Furthermore, regarding physical pain, the symptomatic cohort exhibited a substantially higher mean score than their asymptomatic counterparts (3.1 ± 0.98 and 0.52 ± 0.59, respectively), which was also statistically significant ($p < 0.05$).

DISCUSSION

Our study was conducted on 97 patients examined at the Department of Odonto-Stomatology, Hai Phong Medical University Hospital. . The results indicated that the 18–65 age group accounted for the highest proportion at 71.1% (Figure 2). This cohort typically exhibits a high level of health consciousness, demonstrates the greatest responsibility toward personal well-being, and presents with fewer underlying systemic comorbidities that could otherwise exacerbate oral health conditions. Female patients comprised a slightly higher proportion of the sample than males, standing at 51.5% and 48.5%, respectively (Figure 1). However, this gender distribution discrepancy was not statistically significant ($p > 0.05$), thereby ensuring an objective basis for cross-comparing sex-related dental pathologies. According to our findings, 77 patients presented with mandibular third molar-related complications, corresponding to a remarkably high prevalence of 79.38% (Table 2). This substantial rate can be partially attributed to the fact that 86.0% of the third molars in the studied population were non-vertically erupted. Furthermore,

the subgroup most frequently affected by these complications was female patients, among whom 48 out of 50 examined individuals (96.0%) exhibited at least one third molar-related complication of varying severity. Females represent a highly vulnerable group due to significant monthly physiological hormonal fluctuations as well as changes during pregnancy. These hormonal shifts markedly predispose them to clinical complications, particularly periodontal pathologies, if oral hygiene is sub-optimal or if the teeth are severely malaligned. Among the various pathologies induced by third molars, pericoronitis (or inflammation of the tissue surrounding the crown) emerged as the most common complication (Table 3). In the present study, periodontal complications were recorded at a rate of 70.81%. This prevalence is higher than that reported by Nguyen Hong Nguyen in Hanoi (2022), where the rate of pericoronitis-related complications was 61.1% [4]. Similarly, a study by Lam Van Tuong (2025) demonstrated that mesioangular mandibular third molars increased the risk of complications by 4.94 times, while horizontal impactions increased this risk exponentially by 27.87 times [5]. In a global context,

Alfadil (2020) also established that acute or chronic pericoronitis was the leading complication, accounting for 40.0% to 50.0% of cases [6].

Our research approached mandibular third molar pathologies primarily through the axis of tooth angulation, which provides a clinical rationale and prognostic framework for the commonly encountered complications. Subjects with mesioangular third molars demonstrated the highest incidence of distal caries on the adjacent second molars, affecting 45.83% of all mesioangular teeth (Table 4). This finding aligns closely with the data published by Nguyen Hai Nien (2021), who reported a caries rate of 52.88% [7]. The anatomical impact of a third molar tilting and abutting the second molar induces severe clinical sequences for the patient. These range from localized swelling and pain due to pericoronitis or food impaction in the interdental space, to hard tissue destruction (dental caries) of the second molar, which can subsequently progress to pulpal and periapical pathoses. Furthermore, associated periodontal defects can escalate to abscess formation, resorption of the distal alveolar bone crest of the second molar, and eventual tooth hypermobility secondary to chronic periodontitis. These destructive pathways are thoroughly documented in the dental literature, and our clinical findings strongly reaffirm these established axioms.

One of the complications that directly compromises masticatory function is occlusal interference. Among the 185 examined teeth, 31 exhibited varying degrees of occlusal interference, representing a prevalence of 16.75% (Table 5). Although this rate is lower than that of other pathologies, traumatic occlusion profoundly impacts the masticatory system and leaves behind functional sequelae that are

challenging to correct. However, a limitation of the present study is that we have not yet analyzed the specific severity levels of third molar-induced occlusal disturbances in depth; indeed, domestic literature in Vietnam regarding this specific topic remains scarce. Consequently, this presents a highly promising avenue for future prospective investigations.

Another pivotal objective of our study was to elucidate the specific dimensions of quality of life (QoL) among patients experiencing third molar complications. The domain most profoundly affected by third molar pathologies was physical pain, which yielded the highest mean score of 3.1 ± 0.98 (Table 7). The OHIP-14 instrument serves as a robust tool for clinicians to quantify the subjective burden of oral health conditions on patient well-being. While few active studies in Vietnam have exclusively targeted patients with mandibular third molar complications, data on general oral diseases consistently demonstrate that "physical pain" and "psychological discomfort" are the two domains most negatively impacted. Globally, Slade GD (2004), the developer of the OHIP-14 questionnaire, conducted a study on impacted third molars and concluded that these complications severely diminish patient QoL. Notably, for individuals experiencing acute symptoms such as swelling and pain, the magnitude of QoL impairment can increase threefold compared to asymptomatic individuals [8]. Furthermore, a study by Mike T. John (2005) corroborated a significant decline in QoL scores among populations seeking medical intervention for the extraction of mandibular third molars [9]. Taken together, these findings underline that mandibular third molars and their associated complications represent critical public health issues that warrant greater clinical attention.

This study utilized a cross-sectional descriptive design with a convenience sampling method, resulting in a relatively small sample size of 97 subjects. Consequently, the sample may not fully reflect a balanced age distribution across all demographic subgroups. Furthermore, because the study population was restricted solely to outpatients presenting to the dental clinic, there is a potential risk of selection bias, specifically omitting vulnerable or marginalized individuals who face barriers to healthcare access. Therefore, the actual prevalence of mandibular third molar complications in the general community may be higher than reported in this hospital-based sample.

CONCLUSION

The study revealed a remarkably high prevalence of non-vertically oriented mandibular third molars (86.0%), closely mirroring a substantial. Female patients demonstrated a higher susceptibility to these complications compared to their male counterparts. Structurally, mesioangular impaction emerged as the most destructive configuration, posing the highest risk for adjacent periodontal defects and distal caries on the second molars. Furthermore, quality-of-life assessments indicated that physical pain was the primary burden driven by third molar pathologies, which consequently triggered negative cascading impacts on patients' functional capabilities and psychological domains..

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