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Original Research

Evaluation of Complications and Quality of Life of Patients After Surgical Extraction of Mandibular Impacted Third Molar Teeth: A Prospective Observational Study

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ABSTRACT:

Background: Mandibular third molar extraction is one of the most common surgical procedures in dentistry. Despite its routine nature, it can lead to various postoperative complications that may significantly impact patient quality of life. This study aims to evaluate postoperative complications and their influence on quality of life following mandibular third molar extraction. **Methods:** A prospective observational study was conducted on 60 patients requiring surgical extraction of impacted mandibular third molars. Postoperative complications were assessed clinically at 24 hours, 7 days, and 14 days. Quality of life was evaluated using the Oral Health Impact Profile-14 (OHIP-14) questionnaire preoperatively and at 1, 7, and 14 days postoperatively. Pain was assessed using a visual analog scale (VAS). Statistical analysis was performed to correlate complications with quality of life outcomes. **Results:** The most common postoperative complications were pain (83.3%), swelling (76.7%), and trismus (65%). Less frequent complications included alveolar osteitis (8.3%), paresthesia (6.7%), and infection (5%). OHIP-14 scores showed significant deterioration in quality of life on day 1 postoperatively ($p<0.001$), with gradual improvement by day 14. Multivariate analysis revealed that pain intensity, operation duration, and Winter's classification of impaction were significant predictors of postoperative quality of life ($p<0.05$). **Conclusion:** Surgical extraction of mandibular third molars has a significant but generally temporary impact on patient quality of life. The highest impairment occurs during the first 24-48 hours, with most patients returning to baseline within two weeks. Pain management strategies and patient education regarding expected recovery timelines may improve the overall patient experience.

Keywords: Third molar surgery, postoperative complications, quality of life, OHIP-14, pain management

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INTRODUCTION

Surgical extraction of impacted mandibular third molars is one of the most frequently performed procedures in oral surgery.[1] The incidence of impacted third molars varies between populations, with estimates ranging from 16.7% to 73.5%.[2] Despite being a routine procedure, third molar extractions can lead to various postoperative complications including pain, swelling, trismus, alveolar osteitis (dry socket), nerve injuries, infection, and hemorrhage.[3]

These complications, while mostly temporary, can significantly impact patients' daily activities and quality of life in the immediate postoperative period.[4] The severity and duration of these impacts may vary based on factors such as the degree of impaction, surgical technique, operator experience, patient age, and individual healing capacity.[5,6]

While numerous studies have documented the incidence of specific complications following third molar surgery, relatively fewer investigations have comprehensively assessed how these complications affect patients' quality of life using validated instruments.[7] Quality of life measures provide valuable insight into the patient's perspective on recovery and can guide clinicians in improving perioperative management protocols.[8]

This study aims to evaluate the postoperative complications following surgical extraction of

impacted mandibular third molars and assess their impact on patient quality of life using the validated Oral Health Impact Profile-14 (OHIP-14) questionnaire. By identifying factors that significantly influence postoperative recovery, this research seeks to contribute to evidence-based strategies for enhancing patient experience following third molar surgery.

MATERIALS AND METHODS

Study Design and Patient Selection

This prospective observational study was conducted at the Department of Oral and Maxillofacial Surgery at our Institution between January 2024 and July 2024. The study protocol was approved by the Institutional Ethics Committee. Written informed consent was obtained from all participants.

Sixty patients (32 females, 28 males) aged between 18 and 35 years (mean age: 24.7 ± 4.3 years) requiring surgical extraction of impacted mandibular third molars were consecutively enrolled.

Inclusion and Exclusion Criteria

Inclusion criteria

- Age 18-35 years
- Presence of at least one impacted mandibular third molar requiring surgical extraction
- American Society of Anesthesiologists (ASA) physical status I or II
- Willingness to comply with follow-up visits

Exclusion criteria

- Current smokers
- Pregnant or lactating women
- Patients on medications that could affect wound healing (e.g., corticosteroids, immunosuppressants)
- History of radiation therapy to the head and neck region
- Presence of acute infection at the surgical site
- Patients with systemic diseases affecting healing (uncontrolled diabetes, immunodeficiency)

Preoperative Assessment

All patients underwent a standardized preoperative assessment protocol including:

1. Detailed medical and dental history
2. Clinical examination of the oral cavity
3. Radiographic evaluation using panoramic radiographs and, when indicated, cone-beam computed tomography (CBCT)
4. Classification of impaction according to Pell and Gregory and Winter's classifications[9]
5. Baseline quality of life assessment using the OHIP-14 questionnaire

Surgical Procedure

All surgical procedures were performed by the same oral surgeon with more than 5 years of experience to minimize operator-related variables. The following standardized technique was employed:

1. Local anesthesia using 2% lidocaine with 1:100,000 epinephrine
2. Standard triangular flap design with buccal relieving incision
3. Mucoperiosteal flap elevation
4. Ostectomy using rotary instruments under continuous saline irrigation
5. Tooth sectioning when indicated
6. Extraction using elevators
7. Socket debridement and irrigation with 0.9% sterile saline
8. Wound closure with 3-0 silk sutures

The duration of surgery (incision to last suture) was recorded. All patients received standard postoperative instructions and were prescribed:

- Amoxicillin 500 mg TID for 5 days (or clindamycin 300 mg QID for penicillin-allergic patients)
- Ibuprofen 400 mg TID for 3 days
- Chlorhexidine 0.12% mouth rinse BID for 7 days

Outcome Measures

Postoperative Complications

Patients were evaluated for complications at 24 hours, 7 days, and 14 days postoperatively. The following parameters were assessed:

1. Pain: Measured using a 10-cm visual analog scale (VAS) where 0 = no pain and 10 = worst pain imaginable
2. Swelling: Assessed using a three-point scale: 0 = none, 1 = mild, 2 = moderate, 3 = severe
3. Trismus: Maximum mouth opening (interincisal distance) measured in millimeters using a caliper
4. Alveolar osteitis: Diagnosed based on the presence of a denuded socket, persistent pain, and halitosis
5. Paresthesia: Assessed through subjective reporting and objective testing of lower lip and tongue sensitivity
6. Infection: Diagnosed based on the presence of purulent discharge, fever, and increased swelling after 48 hours
7. Hemorrhage: Classified as primary (during surgery), reactionary (within 24 hours), or secondary (after 24 hours)

Quality of Life Assessment

Quality of life was evaluated using the validated OHIP-14 questionnaire at baseline (preoperatively) and at 1, 7, and 14 days postoperatively. The OHIP-14 comprises 14 items across seven domains: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Each item is scored on a 5-point Likert scale (0 = never, 1 = hardly ever, 2 = occasionally, 3 = fairly often, 4 = very often). The total OHIP-14 score ranges from 0 to 56, with higher

scores indicating poorer oral health-related quality of life.
Additionally, patients completed a daily diary recording pain levels (VAS), analgesic consumption, and ability to perform routine activities for 7 days postoperatively.

Statistical Analysis
Data were analyzed using SPSS version 25.0. Descriptive statistics were calculated for all variables. For normally distributed data, paired t-tests and repeated measures ANOVA with post hoc Bonferroni tests were used to compare changes in outcome measures over time. For non-normally distributed data, Wilcoxon signed-rank and Friedman tests were employed.
Correlations between complications and quality of life measures were analyzed using Pearson or Spearman correlation coefficients as appropriate. Multiple linear regression analysis was performed to identify predictors of postoperative quality of life impairment. P-values <0.05 were considered statistically significant.

RESULTS

Patient Demographics and Surgical Characteristics
Of the 60 enrolled patients, 58 (96.7%) completed all follow-up visits. Two patients were excluded from the final analysis due to protocol violations. The final sample comprised 31 females (53.4%) and 27 males (46.6%) with a mean age of 24.8 ± 4.2 years.
The distribution of impactions according to Winter's classification was: mesioangular (41.4%), horizontal (29.3%), vertical (22.4%), and distoangular (6.9%). According to Pell and Gregory classification, the distribution was: Class I (27.6%), Class II (58.6%), and Class III (13.8%) for ramus relation; and Level A (24.1%), Level B (63.8%), and Level C (12.1%) for depth.
The mean operation time was 23.8 ± 8.7 minutes (range: 12-45 minutes). Tooth sectioning was required in 39 cases (67.2%).

Table 1. Incidence of Postoperative Complications (n=58)

Complication	Number of patients (%)
Pain	48 (82.8%)
Swelling	44 (75.9%)
Trismus	37 (63.8%)
Alveolar osteitis	5 (8.6%)
Paresthesia	4 (6.9%)
Infection	3 (5.2%)
Hemorrhage	2 (3.4%)

The mean pain score (VAS) was highest at 24 hours (6.4 ± 1.8), decreasing to 3.1 ± 1.5 at 7 days and 0.8 ± 0.9 at 14 days postoperatively. Swelling peaked at 48 hours and substantially resolved by day 7 in most patients. The incidence of alveolar osteitis was 8.6% (5 cases), typically diagnosed at the 3-4 day postoperative period.
Four patients (6.9%) reported paresthesia of the inferior alveolar nerve distribution, with three cases resolving by the 14-day follow-up. Three patients (5.2%) developed postoperative infection requiring additional antibiotic therapy.

Table 2. Mean OHIP-14 Scores at Different Time Points (n=58)

Time Point	Mean OHIP-14 Score (± SD)	p-value*
Baseline (preoperative)	7.3 ± 3.6	-
Day 1 postoperative	29.8 ± 6.9	<0.001
Day 7 postoperative	15.4 ± 5.2	<0.001
Day 14 postoperative	8.1 ± 3.8	0.062

Table 3. Multiple Linear Regression Analysis for Predictors of Day 1 OHIP-14 Scores

Variable	Beta Coefficient	95% CI	p-value
Pain intensity (VAS)	0.53	0.38-0.68	<0.001
Duration of operation	0.31	0.14-0.48	0.001
Winter's horizontal impaction	0.25	0.09-0.41	0.003
Pell & Gregory Class III	0.22	0.05-0.39	0.012
Age	0.18	0.01-0.35	0.042
Gender	0.07	-0.06-0.20	0.291

CI = Confidence Interval

DISCUSSION

This prospective study evaluated the incidence of complications following surgical extraction of impacted mandibular third molars and their impact on patients' quality of life. Our findings demonstrate that while complications are common, most are transient and resolve within two weeks postoperatively.

The most frequently observed complications in our study were pain (82.8%), swelling (75.9%), and trismus (63.8%), which is consistent with previous reports.[10,11] These complications peaked within the first 48 hours and gradually resolved over the following days. The incidence of more severe complications such as alveolar osteitis (8.6%), paresthesia (6.9%), and infection (5.2%) was relatively low and comparable to rates reported in the literature.[12,13]

Quality of life, as measured by the OHIP-14 questionnaire, was significantly impaired in the immediate postoperative period. The mean OHIP-14 score increased from 7.3 at baseline to 29.8 on day 1 postoperatively, representing a four-fold increase. This substantial deterioration reflects the considerable impact that third molar surgery can have on patients' daily functioning and well-being in the short term. Similar findings have been reported by Colorado-Bonnin et al.[14] and McGrath et al.[15], who observed significant quality of life impairment during the first week following third molar surgery.

By day 14, most patients (87.9%) had returned to baseline or near-baseline quality of life scores, indicating good recovery. This finding is consistent with the study by Shugars et al.[16], who reported that most patients return to normal activities within 7-10 days after third molar surgery. However, it is noteworthy that approximately 12% of our patients still experienced some degree of quality of life impairment at two weeks postoperatively, suggesting that individual recovery patterns can vary considerably.

Pain emerged as the strongest predictor of poor quality of life in our regression analysis, highlighting the importance of effective pain management in the postoperative period. This finding is supported by Deepti et al.[17], who identified pain as the primary factor affecting quality of life following third molar surgery. Surgical factors, including duration of operation and type of impaction, were also significant predictors of postoperative quality of life, consistent with previous studies showing that more complex extractions are associated with greater morbidity.[18,19]

The "physical pain" and "physical disability" domains of the OHIP-14 were most severely affected in the early postoperative period, reflecting the impact of pain, swelling, and trismus on basic functions such as eating, speaking, and daily activities. Interestingly, patients with paresthesia reported higher scores in the "psychological discomfort" domain, highlighting the psychological impact of sensory disturbances, even when temporary. This finding underscores the importance of thorough preoperative counseling regarding potential nerve injuries and their expected resolution time.

Our study has several strengths, including its prospective design, standardized surgical protocol, use of a validated quality of life instrument, and comprehensive assessment of complications. However, certain limitations should be acknowledged. First, the follow-up period was limited to two weeks, which may not capture long-term complications or quality of life impacts. Second, the study population consisted primarily of young, healthy adults, which may limit generalizability to older patients or those with comorbidities. Finally, we did not include a control group undergoing non-surgical extractions for comparison.

CONCLUSION

Surgical extraction of impacted mandibular third molars has a significant but generally temporary impact on patient quality of life. The greatest impairment occurs during the first 24-48 hours postoperatively, with a gradual return to baseline over two weeks in most patients. Pain intensity, operation duration, and type of impaction are significant predictors of postoperative quality of life.

These findings have important clinical implications. First, thorough preoperative patient education regarding expected recovery timelines and potential complications may help manage expectations and reduce anxiety. Second, optimizing pain management protocols, particularly during the first 48 hours, may substantially improve postoperative quality of life. Finally, modification of surgical techniques for complex impactions may help reduce operation time and subsequent morbidity.

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