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EVALUATION OF SURGICAL OUTCOMES OF IMPACTED MANDIBULAR THIRD MOLARS USING THE BUCCAL TRIANGULAR FLAP AT VINH TUONG MEDICAL CENTER

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ABSTRACT

Objective: To evaluate the surgical outcomes of impacted mandibular third molars using the buccal triangular flap at Vinh Tuong Medical Center in 2023.

Methods: A descriptive cross-sectional study was conducted on 30 patients diagnosed with impacted mandibular third molars and treated using the buccal triangular flap technique. Clinical and radiographic characteristics, surgical difficulty levels, and intraoperative and postoperative parameters were collected using a standardized data collection form and analyzed using medical statistical methods.

Results: Females accounted for 76.67%, and patients aged over 30 years represented 43.44%. A total of 70% of patients presented with complications. The most common impaction pattern was horizontal (43.33%), with Pell and Gregory class II (50%) and position B (60%). Most cases were classified as difficulty level 2 (56.67%) and level 3 (40%). The mean flap creation time was 20.50 ± 5.6 seconds, suturing time was 3.2 ± 1.5 minutes, and total operative time was 26.27 ± 9.96 minutes. The flap tear rate was 3.33%. At 24 hours postoperatively, moderate pain accounted for 56.67% and severe pain for 23.33%; by day 7, 93.33% of patients reported no pain. Swelling peaked on day 3 (32.84 ± 11.76 mm) and decreased to 4.7 ± 5.9 mm by day 7. Postoperative bleeding occurred in 13.33% immediately after surgery but was not observed after 2 hours. Wound dehiscence occurred in 3.33% of cases. No cases of alveolar osteitis were recorded.

Conclusion: Surgical extraction of impacted mandibular third molars using the buccal triangular flap is a safe and effective technique with low complication rates and favorable recovery outcomes, making it suitable for routine clinical practice.

1. INTRODUCTION

Wisdom teeth are the last teeth to erupt during adulthood and are often associated with insufficient space due to prior occupation of the dental arch by other teeth, particularly in the mandible, leading to impaction or malposition [1]. This condition is relatively common in the community, with a notable prevalence among young adults. The abnormal eruption position, combined with difficulties in maintaining oral hygiene, makes impacted mandibular third molars prone to various local complications such as gingivitis, pericoronitis, adjacent dental caries, and abscess formation; in severe cases, they may result in serious systemic complications.

In clinical practice, surgical extraction of impacted wisdom teeth is considered the optimal treatment, especially when complications have occurred. During the surgical procedure, flap design is a crucial initial step that facilitates adequate exposure of the operative field, enables easier manipulation, minimizes tissue trauma, and contributes to improved wound healing. A well-designed flap not only shortens operative time but also reduces postoperative complications.

Currently, various flap designs have been employed in third molar surgery, including envelope flaps, triangular flaps, and semilunar flaps. Among these, the triangular flap with a lateral base is widely used due to its favorable exposure and surgical accessibility. However, the choice of flap design remains controversial, as study results are inconsistent and often depend on the surgeon's experience.

Based on this context, the present study was conducted to evaluate the outcomes of surgical extraction of impacted mandibular third molars using the lateral-based triangular flap at Vinh Tuong Medical Center, thereby providing scientific evidence for selecting appropriate surgical techniques in clinical practice [2].

2. SUBJECTS AND METHODS

2.1. Study Subjects

The study subjects were patients treated at the Department of General Specialties, Vinh Tuong Medical

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Center, who were diagnosed with impacted mandibular third molars and underwent surgical extraction using a lateral-based triangular flap during the study period. Patients were included if they had good general health and oral hygiene and were not using medications that could affect hemostasis or wound healing. Exclusion criteria comprised patients with uncontrolled systemic diseases, poor general health, pregnancy, local infection, refusal to participate, or those treated with alternative surgical techniques.

2.2. Study Time and Setting

The study was conducted at the Department of General Specialties, Vinh Tuong Medical Center. The study period lasted from January 1, 2023, to October 31, 2023.

2.3. Study Design

A cross-sectional descriptive study was conducted.

2.4. Sample Size and Sampling Method

The total sample size consisted of 30 patients, selected using a convenience sampling method.

2.5. Study Content

The study collected and analyzed clinical, paraclinical, and radiographic characteristics of impacted mandibular third molars through clinical examination and X-ray imaging. These included tooth position, angulation, depth of impaction, root morphology, relationship to the inferior alveolar nerve canal, and surgical difficulty. In addition, surgical outcomes were evaluated based on intraoperative indicators such as operative time and flap condition, as well as postoperative indicators including pain level (VAS), swelling, bleeding, wound dehiscence, and alveolar osteitis.

2.6. Study Procedure

Patients were assessed using a standardized medical record form, including medical history, general and oral examination, and imaging diagnosis. After completing necessary investigations, patients underwent surgical extraction of impacted mandibular third molars using a lateral-based triangular flap following standard procedures, including flap design, bone removal, tooth sectioning, tooth removal, and wound closure. Postoperatively, patients received standardized instructions for care and medication and were followed up with scheduled visits to evaluate outcomes.

2.7. Data Processing and Analysis

Data were collected through direct clinical examination and medical records, including all preoperative, intraoperative, and postoperative information. The data were compiled, tabulated, and analyzed using appropriate medical statistical software to ensure accuracy and objectivity. Bias was minimized through appropriate subject selection and exclusion of incomplete records.

2.8. Ethical Considerations

The study was approved by the hospital administration and relevant departments. Patients were fully informed about the study objectives and participated voluntarily, with the right to withdraw at any time. All personal information was kept confidential and used solely for research purposes, ensuring adherence to ethical principles and prioritizing patient safety and well-being.

3. RESULTS

During the study period, a total of 66 patients diagnosed with appendicitis and undergoing laparoscopic appendectomy were collected; however, the specific results are presented as follows:

Table 1. General Characteristics

Characteristics	Group	N	%
Sex	Male	7	23.3
	Female	23	76.7
Age group	<20 years	4	13.3
	20–25 years	2	6.7
	26–30 years	11	36.7
	>30 years	13	43.3
Reason for consultation	With complications	21	70.0
	Without complications	9	30.0
Angulation of impacted mandibular third molars	Vertical	8	26.7
	Mesioangular	4	13.3
	Distoangular	3	10.0
	Horizontal	13	43.3
	Inverted	0	0.0
	Buccal inclination	2	6.7
	Lingual inclination	0	0.0
Relationship with mandibular ramus (space available)	Class I	9	30.0
	Class II	15	50.0
	Class III	6	20.0
Depth relative to second molar	Position A	3	10.0
	Position B	18	60.0
	Position C	9	30.0
Root morphology	Straight	8	26.7
	Curved	6	20.0
	Divergent	1	3.3
	Convergent	13	43.3
	Bulbous	2	6.7
Relationship with inferior alveolar canal	Type 1	19	63.3
	Type 2	11	36.7
	Type 3	0	0.0
Surgical difficulty	Grade 1	1	3.3
	Grade 2	17	56.7
	Grade 3	12	40.0

Comment: Females predominated (76.67%), and the age group over 30 years accounted for the highest proportion (43.44%). Most patients presented with complications (70%). Impacted mandibular third molars were mainly horizontally oriented (43.33%), with Class II ramus relationship (50%) and Position B depth (60%). Surgical difficulty was primarily at Grades 2 and 3.

Table 2. Surgical Outcome Assessment

Characteristics	Mean ± SD
Mean flap creation time	20.50 ± 5.6 seconds
Mean flap suturing time	3.2 ± 1.5 minutes
Mean total surgical time	26.27 ± 9.96 minutes
Flap tear during surgery	N (%)
Tear present	1 (3.33)
No tear	29 (96.67)

Comment: The mean surgical time was relatively short, with flap creation accounting for the largest proportion and suturing requiring less time. The total operative time was stable with low variability. The rate of flap tearing was low (3.33%), indicating that the technique is safe and well-controlled.

Table 3. Postoperative Pain and Swelling

Characteristics	24 hours	Day 3	Day 7
	N (%)	N (%)	N (%)
Pain level			
No pain	0 (0)	8 (26.67)	28 (93.33)
Mild pain	6 (20)	16 (53.33)	2 (6.67)
Moderate pain	17 (56.67)	6 (20)	0 (0)
Severe pain	7 (23.33)	0 (0)	0 (0)
	Mean ± SD	Mean ± SD	Mean ± SD
Postoperative swelling (mm)	26.98 ± 10.91	32.84 ± 11.76	4.7 ± 5.9

Comment: Postoperative pain decreased over time: at 24 hours, moderate and severe pain predominated; by day 3, pain was mainly mild; and by day 7, most patients were pain-free. Swelling peaked on day 3 and markedly decreased by day 7, indicating favorable recovery.

Table 4. Postoperative Bleeding and Wound Dehiscence

Characteristics		N (%)
Bleeding	Immediately after surgery	4 (13.33)
	2 hours post-op	0 (0)
	24 hours post-op	0 (0)
	Wound dehiscence	1 (3.33)

Comment: The rate of postoperative bleeding was low and mainly occurred immediately after surgery (13.33%); no cases were observed after 2 hours or at 24 hours. Wound dehiscence was rare (3.33%), indicating safe and stable surgical outcomes.

Table 5. Alveolar Osteitis

Condition	N	%
No alveolar osteitis	30	100
Wet socket	0	0
Dry socket	0	0

Comment: No cases of alveolar osteitis were observed postoperatively.

4. DISCUSSION

In this study, females accounted for a higher proportion than males; however, studies with larger sample sizes have reported a relatively equal sex distribution [3], [4]. This suggests that the observed gender difference may be attributable to sample characteristics and the study setting.

Regarding age, although many studies have identified the 20–30 age group as the most common and the optimal period for surgical intervention [5], [6], our findings showed a lower proportion in this group. This discrepancy may be related to local demographic characteristics, where younger individuals tend to study and work in large urban areas, while older individuals are more likely to access healthcare services locally.

Most patients presented when complications had already developed, primarily with symptoms such as pain, swelling, trismus, and local infection. This reflects the reality that patients often lack the habit of early dental examination or are not fully aware of the risks associated with impacted wisdom teeth.

In terms of eruption characteristics, the mesioangular position was the most common, consistent with the developmental pattern of mandibular third molars and the limited posterior arch space. Class II ramus relationship predominated, indicating insufficient space for eruption in most cases, thereby increasing the risk of impaction and complications. These findings are consistent with previous studies [3], [7].

Regarding depth, Position B was the most prevalent, indicating that the impacted tooth is often located at an intermediate level relative to the second molar, posing certain surgical challenges. Root morphology was mainly convergent, which is favorable for extraction with a lower risk of root fracture.

Assessment of surgical difficulty showed that most cases were classified as Grades 2 and 3, highlighting the importance of thorough preoperative evaluation and appropriate treatment planning. In addition to classification criteria, surgical difficulty also depends on other factors such as bone density, patient age, and general health status.

The mean surgical time was relatively short, with both flap creation and suturing times within reasonable limits, contributing to reduced tissue trauma and fewer complications. The total operative time was approximately 26 minutes, consistent with studies indicating that shorter operative time is associated with reduced postoperative pain and swelling [8], [9].

The rate of flap tearing during surgery was low and mainly occurred in more complex cases requiring extensive manipulation. This indicates good surgical control and emphasizes the importance of preoperative assessment and gentle handling to minimize soft tissue injury.

Postoperatively, pain was a common symptom but gradually decreased over time. Most patients experienced moderate pain within the first 24 hours, which significantly decreased by day 3 and nearly resolved by day 7. This pattern is consistent with the normal physiological healing process following tooth extraction.

Swelling peaked on postoperative days 2–3, then rapidly subsided and was almost completely resolved by day 7. The degree of swelling depends on the extent of surgical intervention and individual patient response but can be

effectively managed with appropriate postoperative care [10].

Postoperative bleeding was uncommon and primarily occurred immediately after surgery, with no cases of prolonged bleeding observed. This demonstrates effective hemostatic technique and ensures patient safety.

The rate of wound dehiscence was low and mainly associated with cases involving flap damage during surgery. No cases of alveolar osteitis were recorded, indicating that aseptic procedures and postoperative care were well implemented.

Overall, surgical extraction of impacted mandibular third molars in this study yielded favorable outcomes, with reasonable operative time, low complication rates, and a smooth recovery process, consistent with trends reported in previous studies [8], [9].

5. CONCLUSION

Impacted mandibular third molars at Vinh Tuong District Medical Center were predominantly observed in adults, with diverse clinical characteristics but often detected only after complications had developed. Features related to angulation, bone relationship, and depth indicate that most cases had moderate surgical difficulty, requiring careful preoperative assessment. Surgical extraction using a lateral-based triangular flap demonstrated feasibility, safety, reasonable operative time, low complication rates, and favorable recovery. This technique meets the requirements of clinical practice; however, further comparative studies with other techniques are needed to optimize indications and improve treatment outcomes.

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