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EFFECTS OF SMOKING UPON HEALING COURSE AFTER SURGICAL EXTRACTION OF MANDIBULAR IMPACTED THIRD MOLAR IN ABBASI SHAHEED HOSPITAL /KMDC"

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Abstract

Introduction: Patients who smoke suffer worse recovery complications after complex surgical removal of mandibular third molars since smoking constricts blood vessels and weakens the immune response.

Objective: A research project evaluates postoperative pain, swelling, and trismus for patients who get mandibular third molar extractions at Abbasi Shaheed Hospital, Karachi, and screens outcomes between smokers and non-smokers.

Materials and Method: The research was performed as a six-month descriptive study (from December, 2022 to June, 2023), which involved 64 patients who required impacted mandibular third molar extractions. The assessment of postoperative results through the Visual Analogue Scale for the pain involved facial plane measurements for swelling along with mouth opening restriction for trismus took place on days 1, 3, and 10 following surgery. An analysis of the data utilized both descriptive statistics in addition to t-tests.

Results: Smokers exhibited significantly higher swelling on postoperative day 1 (p=0.018) compared to non-smokers, but pain and trismus showed no significant differences across days 1, 3, and 10. By day 10, pain (p=0.741), swelling (p=0.465), and trismus (p=0.923) were comparable between groups.

Keywords: Mandibular third molar, smoking, postoperative outcomes, surgical extraction.

INTRODUCTION

Mandibular third molar extraction surgery remains a routine procedure in oral and maxillofacial treatment, yet it leads to common complications consisting of pain alongside swelling along with trismus and delayed healing of the surgical wound. The complicated issues create substantial impacts

on patient life quality, leading to intensive studies of recovery-determining elements. Smoking has proven itself to be a vital variable because it negatively affects both patient health and wound recovery processes. Research shows smoking causes pulmonary dysfunction and vascular narrowness as well as inhibited fibrinolysis that increases postoperative difficulties from third molar surgery (1). The high incidence of impacted third molars in young adults, reaching 73% in particular groups, requires a thorough analysis of how patient characteristics such as smoking affect recovery (2). A research project performed at Abbasi Shaheed Hospital in Karachi, Pakistan, investigates the postoperative effect of smoking behavior on pain, swelling, and trismus development after mandibular third molar impacted teeth surgical extraction.

The scientific community acknowledges the established mechanisms by which smoking affects all body systems, starting from the cardiovascular system through the central nervous system and terminating the immune response. The act of smoking during oral surgery treatment can delay the healing of surgical wounds and increase the chance of complications that include dry sockets together with infections (3). Nicotine in tobacco exposure results in vasoconstriction that reduces blood flow to the surgical site, which results in stronger post-operative discomfort and tissue swelling (4). The biological response to bacterial colonization suffers damage due to smoking because the function of polymorphonuclear cells becomes impaired, leading to higher postoperative infection risk (5). The inflammatory responses in third molar surgery become worse because smoking heightens the damage to soft and hard tissues during surgical procedures (6). Literature supports that smoking affects the periodontal health of neighboring teeth, including the second molar, which creates difficulties for recovery (7).

The occurrence of difficulties after third molar tooth removal depends on different elements from the patient as well as surgical procedures. Several patient characteristics, including age, together with oral hygiene and smoking habits, influence how pain, swelling, and trismus are expressed during healing (8). The literature shows that smokers developing dry sockets after extraction becomes more common, especially during the first day of postoperative smoking, which extends the recovery period for an extended time (9). The use of surgical procedures that employ sutureless techniques as well as specific flap designs has resulted in better complication rates, especially when treating smokers (10). Research explores anti-inflammatory treatments using corticosteroids as a postoperative inflammation reduction method, although results differ based on patient smoking patterns (11). Some research indicates that smoking does not create lasting effects on postoperative pain or swelling, although the link between smoking and complications remains uneven (12).

Mandibular third molar extraction produces high levels of morbidity through nerve damage while simultaneously causing distal periodontal defects in the area of the second molar. Inputs from smoking can cause poor bone healing outcomes because smoking damages osteoblasts while shrinking bone repair processes, extending recovery times, and increasing the chances of angle fractures (13). Smoking produces heightened deleterious effects on oral health because tobacco leads to elevated frequencies of periodontal disease and tooth decay in people who maintain inadequate oral hygiene (14). Studies have examined whether antibiotic prophylaxis helps prevent infections in third molar surgery, yet most research has provided conflicting evidence about its effectiveness for smokers (15). Multiple investigations yield conflicting results about smoking effects on surgical outcomes in different ethnic groups, necessitating additional studies for definitive insight.

The understanding of smoking effects on surgical results becomes essential for patient care improvement in Pakistan because the smoking rates stay high despite prevailing mostly among younger adults. The healthcare management of postoperative complications becomes more complicated due to the social and cultural background of the patient population at Abbasi Shaheed Hospital, which operates as a significant public medical institution. The recovery process becomes more challenging for smokers because they encounter difficulties in accessing necessary postoperative support and demonstrate poor oral hygiene practices that intensify the harmful impacts of smoking during recovery. This study addresses local literature gaps by providing research-based evidence about how smoking affects healing after third molar surgery to help clinicians create targeted

guidelines for smoker patients. This research examines postoperative pain reaction as well as swelling and trismus development between smokers and non-smokers to add to worldwide knowledge while supporting Pakistani patients specifically.

Objective: Postoperative outcomes (pain, swelling, and trismus) of patients scheduled to undergo mandibular third molar surgical extraction and smokers, as compared to nonsmokers at Abbasi Shaheed Hospital Karachi.

MATERIALS AND METHODS

Settings: The postoperative outcome of surgical extraction of the mandibular third molar was evaluated by a descriptive study with stress on the difference between smokers and nonsmokers.
Study: This study was done at the Department of Oral and Maxillofacial Surgery, Abbasi Shaheed Hospital, Karachi, Pakistan, a large public hospital in the country.
Duration: The study period was from December 30, 2022, to June 29, 2023.

Inclusion Criteria:

Patients included patients aged 15–70 years with impacted mandibular third molars and giving informed consent after they had been educated about the procedure, risks, and benefits. Those enrolled were smokers and non-smokers visiting Abbasi Shaheed Hospital during the study period.

Exclusion Criteria

Patients with systemic conditions affecting healing (i.e., diabetes, immunosuppression) or without consent or with incomplete follow-up data were excluded. Surgical complications and severe preoperative infections that did not stem from smoking were factors that led to exclusion from the study.

Methods

All patients who satisfied the requirements at Abbasi Shaheed Hospital in Karachi received enrollment after consenting to participate. The research team explained every aspect of the surgery, its possibilities for harm, and the advantages of the study. Radiographic and clinical examinations confirmed the condition of impacted mandibular third molars in all research subjects. Local anesthesia was used for surgical extraction procedures, which were executed following standardized procedures by qualified oral surgeons. Postoperative assessments of pain through a Visual Analogue Scale together with swelling measurements in cm^2 using facial planes and trismus evaluation through mouth opening measurements in mm were conducted on the patients on day 1, day 3, and day 10 following surgery. Health personnel tracked patients through direct visits and then followed patients whose wounds took longer than 10 days to heal until they recuperated. The collected data were recorded using a standardized proforma, which was then electronically analyzed. The researchers performed independent t-tests and descriptive statistics, which compared results between smoking and non-smoking patients. Statistical significance was established at $p<0.05$.

RESULTS

The research evaluated postoperative outcomes from surgical third molar extraction at Abbasi Shaheed Hospital Karachi among 64 patients throughout a six-month descriptive study. The study divided its participants into smokers, who numbered 32, and non-smokers, who numbered 32. The evaluation of postoperative pain (Visual Analogue Scale, VAS), swelling (facial plane measurements in cm^2), and trismus (mouth opening restriction in mm) was conducted on days 1, 3, and 10. The independent t-test analysis served for data evaluation and maintained a $p<0.05$ level for statistical significance. Table 1 presents pain scores that demonstrate no substantial variation between both groups. On day one, the mean pain scores of smokers equaled 3.81 (SD=1.47) while non-smokers experienced 3.75 (SD=1.52) ($p=0.856$). The mean pain scores for smokers on day 3 amounted to 2.50 (SD=1.32), whereas non-smokers reported 2.63 (SD=1.41) ($p=0.702$). The pain ratings on day 10 showed minimal levels among smokers, who scored 0.78 (SD=0.09), and non-smokers, who scored

0.81 (SD=0.11; p=0.741). Research findings demonstrate that smoking consumption fails to affect how individuals feel pain after surgical procedures.

Table 1: Pain Scores (VAS) by Smoking Status

Day	Smokers (Mean ± SD)	Non-Smokers (Mean ± SD)	p-value
1	3.81 ± 1.47	3.75 ± 1.52	0.856
3	2.50 ± 1.32	2.63 ± 1.41	0.702
10	0.78 ± 0.09	0.81 ± 0.11	0.741

The data regarding swelling is displayed in Table 2. The first-day result showed smokers had larger edemas (mean=7.75 cm², SD=3.85) than non-smokers (mean=5.44 cm², SD=3.12) due to nicotine causing blood vessels to contract (p=0.018). The swelling levels of smokers measured 3.63 cm² (SD=2.01) on day 3, but non-smokers exhibited 3.25 cm² (SD=1.89) (p=0.465). On day 10, both groups showed minimal swelling, with smokers measuring 0.28 cm² at SD 0.15 and non-smokers measuring 0.25 cm² at SD 0.15 (SD=0.13; p=0.512).

Table 2: Swelling Measurements (cm²) by Smoking Status

Day	Smokers (Mean ± SD)	Non-Smokers (Mean ± SD)	p-value
1	7.75 ± 3.85	5.44 ± 3.12	0.018
3	3.63 ± 2.01	3.25 ± 1.89	0.465
10	0.28 ± 0.15	0.25 ± 0.13	0.512

Table 3 shows no important distinctions existed in trismus measurements. On day 1, smokers showed an average trismus restriction of 0.85 mm (SD=0.12), which matched non-smokers who had 0.84 mm (SD=0.13) restriction (p=0.789). Both smokers and non-smokers exhibited a mean restriction of 0.34 mm (SD=0.18) and 0.32 mm (SD=0.17) respectively on day 3 (p=0.623). On day 10, the two groups demonstrated identical trismus measurements at 0.08 mm (Smokers SD=0.01 and Non-smokers SD=0.02; p=0.923).

Table 3: Trismus Measurements (mm) by Smoking Status

Day	Smokers (Mean ± SD)	Non-Smokers (Mean ± SD)	p-value
1	0.85 ± 0.12	0.84 ± 0.13	0.789
3	0.34 ± 0.18	0.32 ± 0.17	0.623
10	0.08 ± 0.01	0.08 ± 0.02	0.923

Swelling increased significantly in the smoking group during day one. However, pain levels and trismus developed similarly among both groups. On day 10, all measured outcomes merged, indicating that smoking effects mainly affect early recovery stages. Studies confirm that smoking speeds up early postoperative complications.

DISCUSSION

The research data demonstrated that smokers displayed bigger edema measurements on day one (p=0.018), yet the pain intensity and trismus outcomes remained equivalent between both groups until day 10. The influence of tobacco consumption reaches its peak strength during the initial recovery period as all quantitative measurements of pain, swelling, and trismus proved indistinguishable by day 10. The research findings about smoking effects on oral surgery recovery correspond to previous studies, yet they demonstrate special features of the Pakistani patient group.

The elevated swelling experienced by smokers on day 1 matches the natural biological effects of smoking because nicotine causes blood vessels to constrict and disrupts early inflammatory responses in the surgical area. Research by Chen et al. (2021) confirmed that smoking intensifies postoperative complications because it constricts blood vessels and hinders fibrinolysis functions. Evidence shows that swelling intensifies because smoking affects polymorphonuclear cell function which increases

tissue inflammatory risks (Aniko-Włodarczyk et al., 2021). Body mechanisms and standard postoperative care practices such as anti-inflammatory medications seem to diminish smoking-related swelling effects by days 3 and 10 as demonstrated by similar results (p=0.465 day 3, p=0.512 day 10). The research data collected on day 10 revealed no significant differences between groups. However, the findings differed from those of Yildirim et al. (2023) because they documented delayed complications, possibly due to procedural or demographic reasons.

Smoking status did not affect pain ratings when measuring outcomes on postoperative days 1 (p=0.856), 3 (p=0.702), or 10 (p=0.741). These results contradict previous literature linking smoking to more significant postoperative discomfort. The researchers found that nicotine creates vasoconstriction, thus increasing pain by restricting blood flow to tissues (Albanese et al., 2023). This research might show no pain differences since all patients received standardized local anesthetic pain treatment and post-anesthesia pain-reducing drugs that would likely eliminate the effect of smoking. The Visual Analogue Scale assessment process may be prone to inconsistencies since every person interprets pain intensity differently. Research should focus on determining distinct pain threshold dynamics among Pakistani patients since they combine high rates of smoking with different oral habits.

The effect of smoking on trismus outcomes after surgical interventions proved non-significant when analyzing results from day 1 (p=0.789), day 3 (P=0.623), and day 10 (p=0.923). The results differ from Gojayeva et al. (2024) since they found that smokers exhibited greater trismus from increased tissue inflammation together with trauma damage. Results failed to display differences because the research adopted standardized surgical practices, including sutureless techniques and specific flap designs, which decrease tissue damage and reduce trismus (Takadoum et al., 2022). Faster recovery within the research population could result from the participants' young age (~27 years) since young adults tend to have superior tissue resilience (Starch-Jensen et al., 2023).

The study develops essential clinical recommendations that need attention in Pakistan because many young adults continue to smoke at high rates. Patient outcomes require focused postoperative care for smokers, mainly during day 1 because of their severe swelling issues. The day 10 findings show that proper medical management enables smokers to achieve the same surgical healing as non-smokers. Clinicians working at Abbasi Shaheed Hospital can find this data encouraging because it shows non-smokers and smokers experience similar outcomes by day 10. Early intervention proves essential because smoking causes maximum damage soon after surgical procedures.

Scientific limitations stem from the absence of information about smoking intensity and timing relative to surgery since these variables might impact results (Kumari et al., 2021). The research includes only patients without systemic conditions such as diabetes for a focused study, but this approach reduces the study's application to other populations. Research failed to investigate long-term complications, including dry sockets and periodontal defects that tend to affect smokers (Blasi et al., 2023). Subsequent investigations should include more significant participant numbers with sustained monitoring and comprehensive smoking records collection. The medical infrastructure limitations involving postoperative care available in Pakistan need further evaluation since they could intensify smoking-related complications.

The research showed that smoking leads to extensive postoperative swelling during the first day after the third molar surgery, yet it does not influence discomfort or trismus. The unified results from day 10 imply that smoking primarily causes initial recovery problems, therefore creating potential intervention windows. The study enriches global research and fills local Pakistani medical gaps, supporting clinical practitioners by maximizing care for smokers undergoing oral surgery procedures.

CONCLUSION

The clinical study at Abbasi Shaheed Hospital in Karachi from December 2022 to June 2023 reveals smoking to substantially increase swelling measurements on day 1 after the third molar removal from the mandible (p=0.018) while having no significant effect on either pain or trismus when compared to nonsmokers. The results on day 10 show no differences in pain, swelling, or trismus between

smoking and non-smoking patients, thus revealing that smoking mainly affects recovery during the initial period. Targeted anti-inflammatory measures combined with preoperative smoking cessation counseling need implementation since smoke exposure produces early complications for patients. The research provides key insights into smoking effects in oral surgery science, which explicitly addresses Pakistani healthcare settings characterized by widespread smoking behavior. Long-term study results and research into smoking intensity levels will enhance clinical protocols and patient treatment outcomes in publicly funded healthcare facilities.

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