



COMPARING THE IMMEDIATE QUALITY OF LIFE USING COMPLETE CLOSURE AND NON-CLOSURE TECHNIQUES IN THIRD MOLAR SURGERY

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ABSTRACT **Background:** Surgical extraction of the impacted mandibular third molar is associated with intraoperative and postoperative complications, subsequently affecting the patient's wellbeing and reducing the quality of life especially in the week following surgery. Quality of life records are better outcome parameters than clinical variables because it assesses multiple aspects of life. The wound closure technique is an operative factor reported to affect the severity of postoperative complications. If these affectation would translate into any difference in the overall quality of life is yet to be studied. Therefore, there was need to compare the quality of life of two widely varied techniques - the complete closure and the non-closure (sutureless). **Methods:** This was a prospective, randomised clinical study carried out at the Dental and Maxillofacial Surgery department of a tertiary hospital from December 2019 to November 2020. Seventy-four participants were randomized into a complete closure group and a sutureless technique group. They were subjected to the procedure under similar conditions and thereafter followed up for 1 week to assess the changes in their quality of life using the modified OHIP-14 questionnaire. Variables were recorded and analysed using the SPSS (v 25.0). The critical level of significance was set at $P < 0.05$. **Results:** There was no statistically significant difference in the overall QoL changes ($p < 0.05$) although the sutureless technique had less affectation in the speaking domain. **Conclusion:** There was no statistically significant difference in quality of life between complete closure and sutureless techniques following impacted mandibular third molar extraction.

KEYWORDS : Quality of life, Sutureless, Complete closure, Third molar surgery

1. Introduction

Mandibular third molar (M3) impaction affects about 1 in every 4 persons globally [1] especially young adults, a significant number of which would require a surgical extraction. The surgical extraction of the impacted M3 is therefore a common procedure in oral and maxillofacial surgery practices, accounting for about 1 million and 5 million surgeries every year in Canada and the US respectively. [2] The procedure is associated with several complications that can go on to affect the patient's wellbeing and quality of life. The surgical objective should therefore be to remove the tooth with minimal affectation to the patient's overall wellbeing and quality of life.

Several intraoperative and postoperative considerations in the surgical methods have been used in a bid to reduce the inflammatory complications of pain, swelling and trismus. One of such is the wound closure technique. While some authors favour primary closure because it reduces wound contamination [3] and promotes rapid healing, others recommend secondary closure using a few or no sutures (sutureless/ non-closure) because it provides an exit window for escape of inflammatory exudates resulting in comparatively fewer undesirable effects. [4, 5]

Quality of life (QOL) can be defined as the patients' subjective perception of the effect of their disease and its treatments on their daily life. [6] It is currently considered a more valid measure of surgical outcome than measurement of clinical variables such as pain, trismus and swelling. This due to its multidimensional nature that includes the patient's appraisal of his own health [7]

Although previous studies have compared the inflammatory complications associated with the complete closure and sutureless techniques, none to the best of my search has compared the impact of these two closure techniques on patients' quality of life. This study was therefore aimed at investigating the domains of quality of life and comparing the extent to which the patient is affected by primary

closure and sutureless wound closure techniques in third molar surgery.

2. Materials and Methods

This was a randomized controlled study conducted on patients who presented to the Dental and Maxillofacial surgery department of a tertiary hospital between November 2019 and Dec 2020 requiring extraction of an impacted lower third molar under local anaesthesia. Approval for the study was obtained from the Health Research and Ethics Committee (ref XXXX/HREC/2018/No.746) of the institution. The study was designed to compare the domains of the oral health related quality of life at 1 week postoperatively in a complete closure and a sutureless group.

Participants were consenting ASA I patients and at least 18 years of age. Patients with infection, severe pain, facial swelling or limited mouth opening from any cause within 10 days preceding surgery, patients who had allergy to the local anaesthetic agent, and to the study drugs, patients with peptic ulcer disease, smokers, pregnant and lactating mothers, patients on steroids, oral contraceptives, other anti-inflammatory drugs for other reasons were excluded from the study.

Seventy-four subjects were randomized into 2 groups: sutureless (1) and complete closure (2) groups using computer-generated random binaries. Quality of life was assessed just prior to M3 surgery and 1-week post-surgery using the self-administered modified OHIP-14. The modified OHIP-14 questionnaire (Appendix I) comprises of 7 domains and participants were expected to recall how frequently they have had each impact during the week on a 5-point Likert-type scale of 0 (Not at all) to 4 (Severe)

Possible OHIP-14 score range from 0-56. Scores were derived by adding the responses to each question within a domain. A high OHIP-14 score represents a poor quality of life. QoL score can then be categorized as affected (score 0-28) or unaffected (29-56)

All surgical extractions were performed by the same surgeon using 2% lignocaine with 1:100,000 adrenaline under similar operative conditions. Triangular full thickness mucoperiosteal flap and bone removal via buccal guttering with a low-speed straight hand piece under copious continuous irrigation with sterile normal saline were used. Once the tooth had been removed, gentle curettage of the socket was done, followed by a copious irrigation using sterile saline. The flap was then repositioned, and in group 1 no sutures were placed. Direct pressure was applied to the surgical site using sterile rolled gauze moistened with normal saline and patient was asked to clench for 30minutes to achieve haemostasis. In group 2, multiple interrupted vicryl sutures were placed over the extraction socket to achieve hermetic seal with at least one posterior to the extraction socket and another on the interdental papilla distal to the second molar.

Participants received the following; Caps Amoxicillin (GlaxoSmithKline®) 500mg orally 8hourly for 5 days and Tabs Metronidazole (Unigyl® from Unique pharmaceuticals) 400mg orally 8hourly for 5 days after surgery Tabs Ibuprofen 400mg (Brustan-N® from Ranbaxy-Sun pharmaceuticals) was given immediately after the surgery and then 8 hourly for 3 days. Patients were instructed to do warm saline rinses 8 times daily for 7 days. QoL questionnaire was administered on the 7-day postoperative review.

Data collected were analysed using the Statistical Package for Social Sciences (SPSS) for Windows

3. Results

Group 1 (sutureless) and Group 2 (complete closure) had 36 and 38 participants respectively with 35 (47.3%) females and 39 (52.7%) males (M:F=1.1:1). Both groups had no statistically significant difference in their gender distribution (p value=0.068). The age of the participants ranged from 18 to 54 years with a mean age (±SD) of 30.2(±8.3) years. Majority of the participants (60%) were in the 21-30 age bracket (Fig 1). There was no statistically significant difference in the age distribution, impaction type and extraction indications in both groups (Table 1)

The preoperative quality of life (QoL) score ranged from 13 to 51, with an overall mean score of 26.03 (±8.48). There was no statistically significant difference in the preoperative QoL in the two groups (group 1= 24.69 (±8.42); group 2= 27.28(±9.30), p=0.17). About 36% of the subjects had an overall quality of life affectation prior to surgery across all the domains, with the most affected domain being in duty impairment followed by sleep impairment while the least affected domain was in physical appearance (Table 1)

The postoperative QoL scores ranged from 15 to 53 and had a statistically significant increase from the preoperative value with an overall mean of 31.40 (±8.65) (p=0.00). About two-thirds (62.12%) of the total subjects had quality of life affectation. The most affected domain was the eating domain and the impairment of duty domain. (Table 2).

The mean postoperative QoL score was 30.62 and 32.03 in groups 1 and 2 respectively and this difference was not statistically significant (p=0.519).

There was no statistically significant difference in all the domains of QoL except in the speaking (p=0.048) with the sutureless technique showing an advantage over the complete closure (Table 3 and 4).

There was also no statistically significant difference in the proportion of those work hours lost, sick leave requests and the need to change usual social activities and hobbies (Table 5)

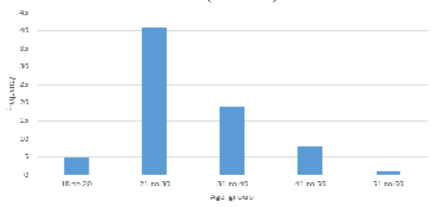


Table 1: Sociodemographic variables in the two groups

	Complete closure	Sutureless	TOTAL	X ² (p)
	N (%)	N (%)	N (%)	

AGE (years)	18-20	2 (5.2)	3 (8.3)	5 (6.7)	3.84 (0.43)
	21-30	19 (50)	22 (61.1)	41 (55.4)	
	31-40	11 (28.9)	8 (22.2)	19 (25.6)	
	41-50	6 (15.7)	2 (5.55)	8 (10.8)	
	51-60	0 (0)	1 (2.78)	1 (1.3)	
Gender	Male	24 (63.16)	15 (41.66)	39 (52.7)	3.42 (.068)
	Female	14 (36.84)	21 (58.33)	35 (47.3)	
		38 (100)	36 (100)		
BMI (kg/m ²)	Underweight	3 (7.89)	1 (2.77)	4 (5.4)	69.97(0.41)
	Normal	21 (55.26)	26 (72.22)	47 (63.5)	
	Overweight	11 (28.94)	8 (22.22)	19 (25.6)	
	Obese	3 (7.89)	1 (2.77)	4 (5.4)	
		38 (100)	36 (100)		
Impaction					
	Mesioangular	15 (39.4)	18 (50)	33(44.6)	4.12 (0.39)
	Vertical	11 (28.9)	8 (22.2)	19 (25.7)	
	Horizontal	9 (23.7)	4 (11.1)	13(17.6)	
	Distoangular	3 (7.9)	5 (13.9)	8 (10.8)	
	Lingual	0 (0)	1 (2.7)	1 (1.4)	
		38 (100)	36 (100)		
Indication					
	Pericoronitis	16 (42.1)	23 (63.9)	39 (52.7)	4.08 (0.13)
	Caries	21 (55.3)	13 (36.1)	34 (45.9)	
	Periodontitis	1 (2.6)	0 (0)	1 (1.4)	
		38 (100)	36 (100)		

Table 2: Percentage of participants affected in the various QoL domains

	PREOPERATIVE (%)	POSTOPERATIVE (%)
EATING ABILITY	39.2	56.8
SPEECH IMPAIRMENT	12.2	33.8
PHYSICAL IMPAIRMENT	2.7	24.3
SLEEP IMPAIRMENT	58.1	27
DUTY IMPAIRMENT	68.9	35.1

Table 3: Comparison of the percentage affected in the QoL domains in the complete closure and sutureless techniques.

QOL DOMAINS	COMPLETE CLOSURE N=38		SUTURELESS N= 36		P VALUE
	N	%	N	%	
EATING ABILITY	20	52.6	22	61.1	0.73
SPEECH IMPAIRMENT	16	42.1	9	25	0.22
PHYSICAL APPEARANCE	10	26.3	8	22.2	0.88
SLEEP IMPAIRMENT	10	26.3	10	27.7	0.98
DUTY IMPAIRMENT	11	28.9	15	41.6	0.50

Table 4: Comparing mean scores of QoL domains in the complete closure and sutureless groups

	Preoperative	Complete closure	Sutureless	p value
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	Mean (SD)	Mean (SD)	Mean (SD)	
Eating ability	12.11 (4.53)	15.26 (4.17)	15.31(3.88)	0.969
Speaking ability	4.75(2.60)	6.93 (2.91)	5.58 (2.15)	0.048
Physical appearance	2.67(1.43)	3.80 (1.86)	3.48 (1.76)	0.505
Sleep impairment	4.42(2.27)	3.866 (1.87)	3.862 (1.97)	0.993
Impairment of duty	1.86(1.00)	2.06 (1.11)	2.51 (1.21)	0.164

Table 5: Percentage of those answering “yes” to the QoL questions stated

	Complete closure (n=38)	Sutureless (n=36)	p value
	n (and %) of “Yes” answers	n (and %) of “Yes” answers	
Have you lost any day at work?	16(44.4)	18(50.0)	0.782
Have you had cause to ask for sick leave or discontinue work?	8(21.05)	10(27.7)	0.797
Have you kept to your usual social activities?	15(39.4)	16(44.4)	0.910
Have you continued with your favorite sports or hobbies?	16(42.1)	19(52.7)	0.626
If no, give reasons (% of Yes)			
Pain?	10(26.31)	10(27.7)	0.232
Swelling?	13(34.2)	6(16.6)	0.224
Physical appearance?	11(28.9)	6(16.6)	0.391
Bad mood?	3(7.89)	3(8.3)	0.44
Malaise?	6(15.78)	5(13.88)	0.46

4. DISCUSSION

Quality of life measure is considered to be a better outcome variable than symptom variables because it ensures that factors affecting the whole person over a wider range of areas are considered.[8] While clinicians tend to focus on biochemical and pathologic factors, this information is only of interest to the patients to the extent that they impact on their overall well-being.

Although several studies have compared the clinical outcome of these two techniques, especially the associated pain, swelling and trismus, none had compared the quality of life changes in them. Comparative findings seem to favour the sutureless technique, with several authors [4, 9, 10] reporting it to have less pain, swelling and trismus. They postulated that the sutureless technique provided an exit window for escape of inflammatory exudates which was responsible for the undesirable postoperative symptoms. These reports may be responsible for the growing preference among practitioners in this region for the sutureless technique over the traditional complete closure. Even though studies comparing these techniques utilized calibrated clinical tools to assess pain, swelling and trismus, they were deficient in predicting the impact on the patients overall wellbeing. Furthermore, there is still no consensus on the results of comparative studies, with some authors reporting no difference in pain, swelling or trismus[11, 12] in the two wound closure techniques.

This study observed no difference in the quality of life affectation between the two techniques, and also showed that the patient's quality of life after one week was similar in both groups. Comparison of the domains of the OHIP14 also found similar affectations of most of the domains of QoL. However, the score in the speaking domain was significantly less affected in the sutureless group. The reason for this is unclear but could be due to the significantly more trismus in the sutureless group. However, it could be speculated that the presence of intraoral sutures could cause a foreign body sensation to the already restless tongue. This might have contributed to speech/speaking difficulty by increasing patient's discomfort from the dangling suture ends. Nevertheless, Honda et al[13] postulated that M3 surgery should have little or no effect on ability to speak as long as structures needed for articulation such as the tongue volume and mobility, are unaffected. The findings revealed a deterioration of the quality of life one week

postoperatively in both groups which is in tandem with similar studies.[14-16] About two-thirds of the patients had scores classified as “affected”. Compared to the preoperative period, the quality of life was worse in all the domains of the OHIP-14 except for the sleep domain and duty impairment, where the postoperative value was improved. This could be because of late presentation,[17] whereby patients would delay presentation until they felt unbearable symptoms. Ibikunle et al[17] reported that majority of their patients from the same region of the country had symptoms for 1-3 months prior to presentation. The finding of this study differs from reports from high income countries where early presentation and even prophylactic removal constituted a significant portion of M3 surgeries done.[18]

The finding from this research revealed that the eating/diet variation domain was the most affected in the week after M3 surgery. Similar finding was reported by Ibikunle et al[14] and Adeyemo et al[19] for surgical and nonsurgical extractions respectively. Tooth extractions, surgical and nonsurgical, and maybe other invasive intraoral procedures, could affect the ability of the patient to feed well and enjoy food. Therefore, the eating/diet affectations should be a significant factor for consideration in the postoperative management of patients who undergo M3 removal. Appetizing non-chew diet should be recommended during this period.[20]

Findings from this study thus indicate comparable quality of life affectation in two widely differing surgical wound closure techniques used in mandibular third molar surgery. Despite several studies preferring one technique over the other based on certain clinical parameters such as pain, swelling and trismus, the most important factor in assessment, the quality of life, is equally affected by the wound closure techniques used. Therefore, surgeons should reassess their practices and base their choice of closure technique on other parameters such as costs, patient's preferences, operation time etc.

An improvement on the oral health related quality of life tools have emerged. This tool, not available at the time this study was done, fits empirical data and is more psychometrically sound. This newer tool has a more clinically plausible structure that incorporates four OHRQoL dimensions.[17] We therefore recognize that this tool may further validate the study objective but is unlikely to significantly alter the findings of this study. Nonetheless, we recommend a multicenter study involving a larger and more diverse population.

5. CONCLUSION

There was no statistically significant difference in the oral health related quality of life in the sutureless and the complete closure techniques following M3 surgery, although patients in the sutureless group had less speaking ability affectation.

6. CONFLICT OF INTEREST - None

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