Research Paper

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Influence of Age ,Operative Time and Types of Impaction on Post Operative Tissue Reaction Following Mandibular Third Molar Impactions in Male Adults : A Single Institutional Experience.

Medical Science

KEYWORDS : Third molar impaction/ Type of impaction/Age/Pain/Swelling

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ABSTRACT

Objectives: This paper investigate the relationship between effect of age, type of impaction and operative time on pain, swelling and trismus following mandibular third molar surgery..

Methods: Consecutive patients with impacted mandibular third molar teeth were studied. All the third molars were classified according to Winter's classification. Surgical extraction was performed on all the patients by a single surgeon under local anaesthesia. The operation time was determined by the time lapse between incision and completion of suturing. Postoperative pain, swelling and trismus were evaluated.

Results: There were 150 male patients with an age range of 18-40 years. The patients in the age range of 38-40 years recorded a significantly lower pain score compared with the lower age group on all days except day 2 (p) . The mouth opening was much better in the age group of 26-29 (p = 0.000) . Pain, swelling and trismus increased with increasing operative time. Horizontal impaction is significantly associated with higher VAS score on Day 1, 2 and 3. (p = 0.000, 0.000 and 0.001) .Distoangular and horizontal impaction are associated with a higher degree of swelling and reduced mouth opening on postoperative review days. Vertical impaction was associated with the least degree of facial swelling and best mouth opening.

Conclusions: Increasing operating time and advancing age are associated with more postoperative morbidity and Horizontal and Distoangular impacted teeth having more post operative inflammatory complications.

Introduction:

The extraction of the impacted mandibular third molar is a common oral surgical procedure [1] and it is often attended by complications, which are distressing to patients [2]. Pain, trismus and swelling are common complications reported after third molar surgery[3] and they are thought to arise from inflammatory response which is a direct and immediate consequence of the surgical procedure [4].The adverse effects of the third molar surgery on the quality of life have been reported to show a three-fold increase in patients who experience pain, swelling and trismus alone or in combination, compared to those who were asymptomatic[3,4]. Many clinicians have thus emphasized the necessity for better control of pain, swelling and trismus in patients who undergo third molar surgery. There have been few attempts to study patient's expectations regarding outcomes, although patient's perceptions of recovery following third molar surgery still have not been reported. Pain, swelling and trismus are normal reactions following third molar surgery and are frequent indices of researches both in the methodology of the surgery and the pharmacology of drugs used.

These factors can be divided into immediate postoperative tissue reactions and complications[2,3]. The immediate postoperative tissue reactions are characterized by pain, swelling, trismus[3,4].These are the normal reactions following third molar surgery. Factors affecting postoperative complications could be related to patient, tooth and operative factors[5].Patient factors include age, sex, ethnic background, smoking, contraceptives and oral hygiene[6].Tooth related factors include infection (Pericoronitis), type of impaction, depth of impaction, relationship to inferior alveolar nerve, density of surrounding bone and associated pathology like cyst or neoplasm [7] . The operative factors include the use of drugs, type and extent of incision, wound closure technique, surgeons experience and duration of operation[8,9].Recent literature may offer further information for a better estimation of these complex factors and its relationship with inflammatory tissue reactions but these findings are conflicting and there is considerable variation in the factors involved.

A systematic review of the literature to identify important variables that have been consistently listed as determinants of surgical difficulty ,which are based on operating time are the most current evidence applicable to clinical practice in relation to the evaluation and surgical management of impacted mandibular third molars and its relationship with inflammatory tissue reactions . The most consistent determinants factors that can affect the inflammatory tissue reactions are age, surgical procedure, depth of impaction and operative time **[10]**. Yuasa H et al, 2004 and Barbosa- Odemo Gaya MVO et al[7] study showed that a less important relation was observed with patient sex but older patients and those subjected to extractions involving a greater number of sutures and more operative time refer the most intense inflammatory tissue reaction. Perrott DH et al[11] study indicate that third molar surgery in patients 25 years of age or older is associated with minimal morbidity, a low incidence of postoperative complications, and minimal impact on the patients quality of life and postoperatively, specifically for patients 25 years of age or older. Adeyemo et al [12,13] study does not support the surgical morbidity increases with age which is based on the assumption that surgical morbidity increases with age while Obimakinde OS et al[14] findings shown that increasing age of the patient and the angulation of mandibular third molar impaction increases the risk of operative difficulty significantly. Which in turn result in more post operative inflammatory tissue reactions. Bruce et al [15] while investigating the role of age on postoperative morbidity associated with mandibular third molar, found that the patients above 35 years recorded more swelling and trismus. There are a number of previous studies carried out to evaluate such condition in the extraction of impacted mandibular third molars [16,17]. However, most of these studies are only based on dental factors determined through radiologic assessments. However, the magnitude of the contributions of the different categories of variables remains to be quantified.

Impacted lower third molar was classified by winter's classification in our study based on its orientation to an imaginary line passing through the occlusal surfaces of first and second molars to the retromolararea as seen on a periapical radiograph or orthopanthomograph[18].We follow the winter's classification of impaction in our study [18,19].

Definition of operating time varies among different reports. Akinwande JA [20] defined this as the time lapse between the beginnings of bone drilling to the end. Raprastikul et al [21] on the other hand defined it as the time lapse between incision and completion of suturing. The operation time was determined by the time lapse between incision and completion of suturing in

our study.

Age of patients, type of impaction and duration of operation have been mentioned in scientific literatures as factors that influence the immediate postoperative reactions following third molar surgery but objective assessments was lacking also there was no consensus of opinion regarding patient factors that are contributory to operative difficulty of mandibular third molar surgery and its relationship with post operative inflammatory tissue reaction, This study was an attempt to determine the effect of all these factors on pain, swelling and trismus following mandibular third molar surgeries and also to compare our findings with previous reports in the literature.

Materials and Method :

Consecutive patients with impacted mandibular third molar teeth between the 18 to 40 years age group with sample size of 150 patients were studied ,who were referred to the oral surgery clinic of university hospital and full filled the following inclusion criteria with due permission of local ethical committee were recruited in the study.

Inclusion criteria :

- Male patients who were having impacted mandibular third molar(Winter's classification, Pell and Gregory Class I-B) [18,19]
- No systemic disease with good general health.
- Non smokers
- No evidence of acute inflammation orally
- No contraindication to use routine medications like anesthetic agents or antibiotics/analgesics.

Written informed consent for the study was taken from all the patients. The patient selected for the study purpose were randomly assign in to six age group.

Group 1 : 18 to 21,Group 2 : 22 to 25,Group 3 : 26 to 29,Group 4 : 30 to 33,Group 5 : 34 to 37,Group 6 : 38 to 40

Orthopantomographic images was used to classify all the impacted mandibular third molars. Surgical extraction of a tooth per session w1as performed on all the patients by the same surgeon . Patient were made to sit comfortably on the dental chair. Face was prepared with Betadine and standard draping was done. All the patients were instructed to rinse with 5–10 ml of 0.12% of Chlorhexidine for 2 min preoperatively. The effective anesthesia was achieved with 1:2,00,000 Lignocaine with Adrenaline solution by giving classical inferior alveolar nerve block, lingual nerve block and long buccal nerve block on the side to be operated. A standard ward's incision was used . For the patients that required bilateral extraction, a gap of at least 15 days was allowed between the two procedures to allow for total recovery from the first one. ostectomy was carried out with a flat fissure bur (S.S.White, no 701) and normal saline irrigation. With adequate ostectomy, elevation of the tooth was carried out and was followed by socket toileting. Sectioning of the tooth was carried out whenever necessary. After achieving proper hemostasis, flap was repositioned & sutured hermetically with 3-0 black braided silk. Two suture taken distal to second molar and one suture was at reliving incision They were then discharged home with standard postoperative instructions.

Which included the following.

- Ice pack application for 6 h after surgery, alternating 30 min of application with 30 min pause.
- Soft diet for 2 days.
- Normal oral hygiene maintenance with 0.12% Chlorhexidine twice daily.
- All patients were given Cap. Amoxicillin 500 mg thrice a day for 5 days. and Tab. Brufen 400 mg thrice a day for 5 days.
- Patients were given a daily pain & swelling record sheet to be completed during the subsequent 7 days.
- Patients were called for follow up on 2^{nd},5^{th} and 7^{th} postoperative day. Sutures were removed on 7^{th} postoperative day.

Evaluation Criteria :

The following parameters were recorded.

Operative time (OP):

The operation time was noted from the start of putting surgical intra oral incision at site of impacted third molar up to completion of suturing at surgical site with the stopwatch.

Mouth Opening(Trismus):

Mouth opening was assessed by measuring the inter incisal distance between the upper and lower right central incisor on the 2^{rd},5^{th} and 7^{th} days after surgery by Boyle's gauge-a venire calibrated caliper . Three reading were taken for each patient and average was determined .Maximum inter-incisal distance (MID) was used as the index of trismus.

Pain (VAS score):Table 1

Subjective method of visual analogue scale was used for evaluation of pain It was consist a pain rating scale subdivided into five equal parts, one end corresponds to no pain and other to extremely severe pain .A card describing predetermined values of pain (Table 1) was given to all patient and they were asked to fill the record everyday on pain rating scale for seven days except days they came for follow up (2^{nd} ,5^{th} ,7^{th} days) post operatively making references to predetermined values.

Swelling :Figure 1

It was assessed by a modification of a 3 line measurements using 5 fixed points on surgical side of the face. [22] .The horizontal distance from the corner of mouth to the lobe of the ear and vertical distance from outer canthus of eye to the angle of the mandible was measured with a silk suture following the contour of soft tissue, and not stretching the suture thread. The measurement was transferred on a scale & recorded in the record sheet.

These are the fixed points used

A: The most posterior point at the midline on the tragus,
B: Lateral canthus of the eye,
C: The most lateral point on the corner of the mouth,
D: Soft tissue pogonium which is the most prominent point at the midline on the chin and
E: Most inferior point on the angle of the mandible.

The 3 lines were AC, AD and BE.

A baseline measurement was carried out just before the surgery and similar measurements was carried out on days 2^{nd} , 5^{th} and 7^{th} post surgery days. Three readings for each patient was taken and the average score was used. This constitutes the reading for the particular day. The difference between the postoperative and preoperative measurements was calculated.

Data was analysed and calculated with Statistical Package for Social Sciences (SPSS) 15.0 for Windows. A multivariate analysis of the effect of patients' age, sex, type of impaction and operative time on pain, swelling and trismus was noted.

Results :

Total 150 patients were studied . The age range of the patients was 18 to 40 years with a mean (SD) age of 26.34 (5.495) years. 38 (25.33%) patients were having the age up to 21 years. 35 (23.33%) patients were in the age range of 22-25 years, 34 (22.67%) patients were in the age range of 26-29 years , 22 (14.67%) patients were in the age range of 30-33 years, 16 (10.67%) patients were in the age range of 34-37 years and 5 (3.33%) patients were in the age range of 38-40 years. The effect of the age on pain, swelling and trismus is shown in figures 1A, 1B and 1C. (figure 2).The patients in the age range of 38-40 years recorded a significantly lower pain score compared with the lower age group on all days except day 2 but number of patients were very less so statistically significant but needs more number of patient for final conclusion. The mouth opening was much better in the age group of 26-29 on day 2, day 5 and day 7. There was steady increase in swelling recorded with the increasing age but the difference in swelling amongst

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the age group ranges were not statistically significant.

The operating time was divided in four group .The distribution of operative time and its effect on mouth opening, pain and swelling is shown in Table 2 and Table 3 respectively. The pain increased progressively with the increasing operative time on day 1 (p = 0.000).The difference between the operative time was statistically significant on day 2 and 5 but not significant on day 7 for trismus and swelling. There was a progressive increase in swelling and trismus with increasing operative time.

The distribution of type of impaction and its effect on trismus, pain and swelling is shown in Table 4 and Table 5 respectively. Horizontal impaction is significantly associated with higher VAS score on Day 1, 2 and 3. (p = 0.000, 0.000 and 0.001) when compared with other types of impaction. Distoangular and Horizontal impactions are associated with a higher degree of swelling (p = 0.000, 0.000 and 0.006 on days 2, 5 and 7 respectively) on postoperative review days when compared with vertical and mesioangular impaction. Vertical impaction was associated with the least degree of facial swelling (on day least is Mesioangular) and best mouth opening among the types of impaction.

A multivariate analysis of the effect of patient's age, type of impaction and operative time on pain, swelling and trismus is shown in Table 6. Using Pillai's trace, Operative time, with an eigen value of 0.765, contributed least to the dependent variables pain, swelling and trismus while recoded age as a single factor, affected the dependent factors most with an eigen value of 0.918. Interaction of type of impaction and Recoded age had the highest eigen value of 1.93 compare to other factors matrix test, indicating that the interactions of type of impaction and Recoded age affected pain, swelling and trismus observed in operated patients most. The significance of models ($p<0.05$) is an indication that the effects of age type of impaction and operative time on pain, swelling and trismus were not due to chance.

Figure : 1 : Facial swelling measurement by joining the 3 lines AC, AD and BE

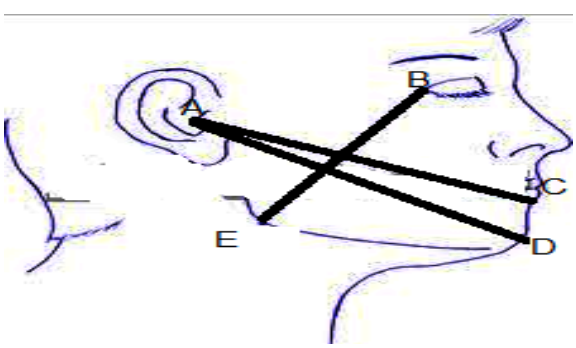
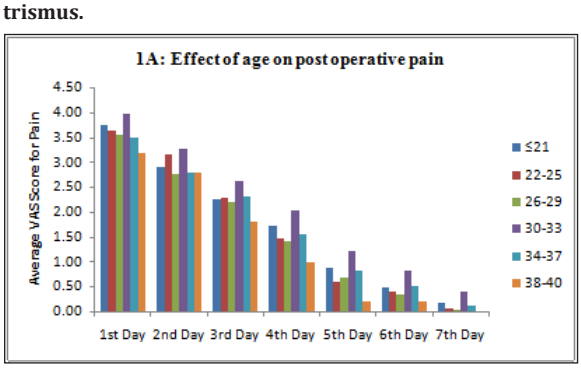
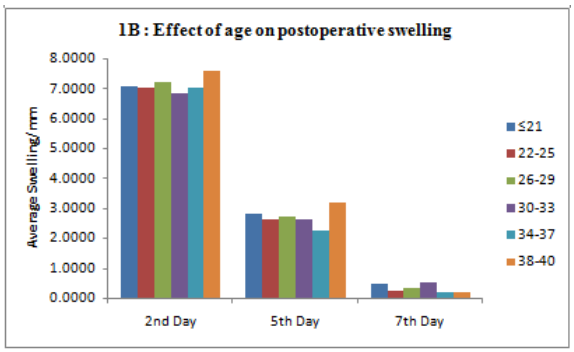


Figure 2 : Effect of Age on post operative pain, swelling and trismus
A. Influence of age on Postoperative pain. B: Effect of age on Postoperative swelling. C: Influence of age on postoperative trismus.





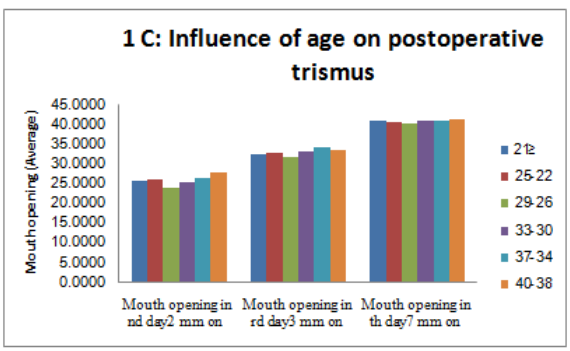


Table 1 VAS scale to evaluate pain : Reference values given to the patients[]

0	No pain	The patient feels well
1	Slight pain	If the patient is distracted he or she does not feel the pain
2	Mild pain	The patient feels pain even if concentrating on some activity
3	Moderate pain	The patient is very disturbed but nevertheless can continue with normal activities
4	Severe pain	The patient is forced to abandon normal Activities
5	Extremely pain	The patient must abandon every type of activity and feels the need to lie down

Table 2: Influence of operative time on post operative pain

Operative Time/ Minutes	Visual analogue scale : VAS score							
		Day 1	**Day2**	**Day3**	**Day4**	**Day5**	**Day6**	**Day7**
≤ 20	Mean	2.80	2.32	1.84	1.48	0.64	0.44	0.04
	N	25	25	25	25	25	25	25
	Std.Deviation	0.70	0.62	0.68	0.71	0.70	0.58	0.20
21-26	Mean	3.52	2.74	2.11	1.28	0.54	0.35	0.09
	N	52	54	54	54	54	54	54
	Std.Deviation	0.92	0.75	0.57	0.62	0.53	0.52	0.29
27-32	Mean	4.04	3.37	2.58	1.85	0.88	0.54	0.15
	N	54	52	52	52	52	52	52
	Std.Deviation	0.83	0.82	0.72	0.84	0.67	0.60	0.36
33-38	Mean	4.26	3.40	2.68	2.05	1.42	0.68	0.32
	N	19	19	19	19	19	19	19
	Std.Deviation	0.933	1.01	1.00	0.91	0.83	0.74	0.47
Total	Mean	3.67	2.98	2.30	1.61	0.79	0.47	0.13
	N	150	150	150	150	150	150	150
	Std.Deviation	0.98	0.89	0.76	0.81	0.71	0.59	0.34
	P value	0.000	0.000	0.001	0.013	0.000	0.180	0.040

Table 3: Effect of operative time on post operative swelling and Trismus

Operative Time/Minutes Day2		Swelling/mm			Mouth opening/mm		
		Day5	**Day7**	**Day2**	**Day5**	**Day7**	
≤ 20	Mean	6.40	2.34	0.16	28.96	35.56	41.52
	N	25	25	25	25	25	25
	Std.Deviation	1.29	0.72	0.40	3.39	2.55	1.58
21-26	Mean	6.75	2.40	0.31	25.77	33.05	40.33
	N	54	54	54	54	54	54
	Std.Deviation	1.09	0.78	0.47	3.65	3.80	1.62
27-32	Mean	7.45	2.93	0.37	24.02	31.25	40.28
	N	52	52	52	52	52	52
	Std.Deviation	1.09	0.74	0.47	3.07	3.13	1.52
33-38	Mean	7.70	2.98	0.57	22.73	30.57	40.26
	N	19	19	19	19	19	19
	Std.Deviation	1.34	0.79	0.58	3.10	2.94	1.32
Total	Mean	7.05	2.65	0.34	25.31	32.53	40.50
	N	150	150	150	150	150	150
	Std.Deviation	1.23	0.80	0.49	3.84	3.64	1.60
	P value	0.002	0.020	0.064	0.000	0.000	Unidentified

Table 4: Relationship of types of impaction and post operative pain.

Type of Impaction	Visual analogue scale							
		Day 1	**Day2**	**Day3**	**Day4**	**Day5**	**Day6**	**Day7**
MA	Mean	3.24	2.56	1.98	1.32	0.61	0.29	0.05
	N	37	37	37	37	37	37	37
	Std.Deviation	0.72	0.55	0.43	0.52	0.50	0.51	0.16
V	Mean	2.97	2.20	1.60	1.38	0.45	0.361	0.02
	N	36	36	36	36	36	36	36
	Std.Deviation	0.81	0.81	0.75	0.93	0.68	0.48	0.23
DA	Mean	4.28	3.50	2.71	1.84	1.12	0.61	0.25
	N	39	39	39	39	39	39	39
	Std.Deviation	1.00	0.94	0.84	0.84	0.80	0.67	0.44
H	Mean	4.10	3.28	2.58	1.84	0.92	0.60	0.18
	N	38	38	38	38	38	38	38
	Std.Deviation	0.65	0.79	0.61	0.75	0.63	0.63	0.39
	P value	0.000	0.000	0.001	0.013	0.000	0.180	0.040

MA: Mesioangular impaction
V: Vertical impaction
DA: Distoangular impaction
H: Horizontal impaction

Table 5: Influence of types of impaction on post operative swelling and trismus

Type of impaction Day2		Swelling/mm			Mouth opening/mm		
		Day5	**Day7**	**Day2**	**Day5**	**Day7**	
MA	Mean	6.24	2.17	0.20	27.02	34.05	40.56
	N	37	37	37	37	37	37
	Std.Deviation	0.95	0.65	0.42	3.51	2.58	1.46
V	Mean	6.18	2.25	0.17	27.44	34.83	41.16
	N	36	36	36	36	36	36
	Std.Deviation	1.02	0.72	0.33	4.01	2.90	1.48
DA	Mean	7.98	3.13	0.59	19.55	25.51	40.35
	N	39	39	39	39	39	39
	Std.Deviation	0.80	0.64	0.57	3.43	4.05	1.81
H	Mean	7.72	2.99	0.39	22.31	28.94	39.97
	N	38	38	38	38	38	38
	Std.Deviation	0.92	0.72	0.48	9.77	2.80	1.42
	P value	0.000	0.000	0.006	0.001	0.000	Unidentified

Table 6: Multivariate Tests of the effects of Operative time, Age range, Type of impaction and sex on swelling , Trismus and pain

Effect		**Value**	**F**	**Hypothesis df**	**Error df**	**Sig.**
Opertime	Pillai's Trace	0.765	2.053	39.000	234.000	0.001
	Wilks' Lambda	0.408	2.046	39.000	225.800	0.001
	Hotelling's Trace	1.063	2.035	39.000	224.000	0.001
	Roy's Largest Root	0.537	3.224(b)	13.000	78.000	0.001
Impaction	Pillai's Trace	0.894	2.546	39.000	234.000	0.000
	Wilks' Lambda	0.300	2.900	39.000	225.800	0.000
	Hotelling's Trace	1.725	3.303	39.000	224.000	0.000
	Roy's Largest Root	1.329	7.976(b)	13.000	78.000	0.000
Recoded_Age	Pillai's Trace	0.918	1.384	65.000	400.000	0.034
	Wilks' Lambda	0.351	1.386	65.000	363.106	0.034
	Hotelling's Trace	1.208	1.382	65.000	372.000	0.035
	Roy's Largest Root	0.491	3.021(b)	13.000	80.000	0.001
Opertime * Impaction	Pillai's Trace	1.449	1.240	117.000	756.000	0.054
	Wilks' Lambda	0.182	1.271	117.000	581.507	0.040
	Hotelling's Trace	2.041	1.295	117.000	668.000	0.028
	Roy's Largest Root	0.737	4.761(b)	13.000	84.000	0.000
Opertime * Recoded_Age	Pillai's Trace	1.649	1.167	143.000	946.000	0.102
	Wilks' Lambda	0.140	1.208	143.000	662.134	0.066
	Hotelling's Trace	2.390	1.240	143.000	816.000	0.040
	Roy's Largest Root	0.779	5.152(b)	13.000	86.000	0.000
Impaction * Recoded_Age	Pillai's Trace	1.930	1.180	169.000	1,144.000	0.069
	Wilks' Lambda	0.100	1.214	169.000	726.793	0.048
	Hotelling's Trace	2.806	1.231	169.000	964.000	0.033
	Roy's Largest Root	0.812	5.495(b)	13.000	88.000	0.000

a. Exact statistic
b. The statistic is an upper bound on F that yields a lower bound on the significance level.
c. Design: Intercept+Opertime+Impaction+Recoded_Age+Opertime * Impaction+Opertime * Recoded_Age+Impaction * Recoded_Age+Opertime * Impaction * Recoded_Age

Discussion

The postoperative course after removal of impacted third molar is dominated by pain, swelling and trismus , which reflect inflammatory tissue reactions. Thus, despite the diversified demands of practice, the dilemma of explanations regarding operation time, associated risk factors of operative difficulty and attendant post-operative morbidity is still confuse . Both the patient and dental surgeon must therefore have scientific evidence-based information concerning the estimated degree of post operative inflammatory reaction and surgical difficulty in each case.

This study has shown that age ,operative time and angulation of the third molars definitely play a role in the incidence of post operative inflammatory tissue reaction. Third molar surgery result in physical injury to the tissues and are therefore followed

by inflammatory reaction [23]. It has been proposed that following tissue injury or inflammation, there is a sequential release of mediators from mast cells, the vasculature and other cells. Histamine and serotonin appear first, followed shortly after by bradykinnin and later prostaglandins and other eicosanoids. Bradykinnin has been shown to produce pain in man when given intradermally, intraarterially or intraperitoneally and the hyperalgesia associated with prostaglandin is also due to its potentiation of Bradykinnin effect [23]. Postoperative swelling results from accumulation of protein rich exudates within the surrounding tissue and trismus occurred as a result of spasm of muscles fibres following inflammatory processes. These reactions (pain, swelling and trismus) may be a consequence of the formation of prostaglandins and other mediators of inflammation derived from membrane phospholipids, which are released following surgery .

This study recorded a significant influence of age on post operative morbidity following surgical extraction of impacted third molar teeth. Postoperative inflammatory tissue reaction increase with older age, angulation of third molar and longer procedure in our study. A higher degree of pain, trismus and facial swelling was recorded in patients with advancing age on 2nd ,5th day after surgery but on 7th post operative day, patients were normal . These finding are in agreement with some of the studies. The Obimakinde OS et al [14] findings shown that increasing age of the patient and the angulation of mandibular third molar impaction increases the risk of operative difficulty significantly. Which in turn result in more pain, trismus and facial swelling in older age patients. Bruce et al [15] while investigating the role of age on postoperative morbidity associated with mandibular third molar, found that the patients above 35 years recorded more swelling and trismus.

The reason might be that erupted molars in older patient have tend to have more dense cortical bone, which may increase bone cutting time[2,24] and it can be a reason why age has a significant correlation with increase operative time in the present study [25],which was the reason that older patient having more trismus, swelling and higher VAS score for pain also older patients erupted third molar have been used for mastication and are therefore more tightly connected to the alveolar bone by the periodontal ligament, which requires more aggression to remove teeth. In our study it showed that rate of post operative complication were increases gradually after age of ≥ 30 years. These results of present study are also coincide with the study of Chuang SK et al [26] ,which showed that increased age (>25 years) appears to be associated with a higher complication rate for mandibular third molar extractions. The positive correlation may be related to the increase in bone density, which may require more handling during the operation. these findings contradicted those Monaco et al [27],who found no association between duration of difficulties and postoperative inflammatory tissue reactions. These contradiction could be due to the different study setting and factors that were studied .Few complications occurred in the present study, as only 3 patients experienced postoperative infection, which is in agreement with findings reported by Yuasa and Sugiura [17], Chiapasco M et al[2].Who believe that the correlation between age and post operative complications might be related to increased bone density which may result in more manipulation during the operation. Which could be factors for increase chances for infection.

In the present study, pain was assessed with VAS score. Berge TI et al [27,28] had done a thorough investigation of visual scale & other objectives of assessment of pain and came to conclusion that pain, being an exclusive subjective experience, can be successfully assessed with the VAS. The VAS has also been established as a reliable and sensitive method for recording pain so we follow the standard VAS scoring method for recording pain score after third molar surgery.

This study recorded a higher score of pain perception in the older patient than the younger ones within the first 24 hours of surgery and on following 2nd ,5th days after surgery but on 7th day most of the patients having no pain. Pain following third molar surgery has been shown to peak within first 24 hours of surgery which has equally been confirmed with this study of Capuzzi P et al [28].These may be related to increased stress and anxiety level in immediate 24 hour after surgery. The pain on other subsequent day may related to slow healing process.

Patients factors that were found to correlate significantly with increase operation time were age and degree of angulation of the impacted third molar tooth In our study it showed that increase operative time was associated with higher degree of VAS score , more swelling and reduced mouth opening compare to other operative time group.(Table no:2,3) so it's suggest that increasing operative time is associated with more post operative inflammatory tissue reaction in our study.

More frequent immediate and late complications are associated with longer duration of surgery, flap with vertical incision, extraction needing more bone removal, and extraction without tooth sectioning might be responsible for making the surgery more traumatic and more difficult and thus could increased for more post operative complications that's why increase operative time in our study is associated with higher post inflammatory tissue reaction for pain, swelling and trismus on 2nd and 5th day after surgery but on 7th day most of the patients recover completely. A steady increase in severity of pain, trismus and swelling was observed with increased operation time despite the fact that the difference was not statistically significant. In a study on a consecutive series of 104 patients, Garcia GA et al[4] in reported a correlation between operation time duration and analgesic use over the first 48 hours post surgery. The same finding was also reported by Perderson A et al [9] while investigating the interrelation of complaints after removal of impacted mandibular third molars. The duration of operation in the hand of a single surgeon could be a reflection of the difficulty and hence duration of tissue injury associated with the operation . The longer the duration of tissue injury, the more the amount of mediators released and therefore could be a result in more the severity of pain, swelling and trismus.

Vertically impacted third molars were associated with the least complications. whereas distoangular and horizontal third molar impactions were associated with more complications. These could be due to increase difficulty of extractions and the need for more bone removal and more operative time in distoangular and horizontally impacted teeth [10].

The commonest type of impaction recorded in our study was distoangular (n = 38).In the study of Bui Chi H [5] maximum number of third molar were horizontal position. In another study by Chuang SK et al [26] they found that maximum number of patients were horizontal or mesioangular. These variations in angular position of the third molars may be because of the fact that the studied population in each study was quite different from each other. In our study distoangular impacted third molars were associated with higher degree of VAS score , more swelling and trismus compare to other type of impacted teeth (Mesioangular,Vertical,Horizontal) (Table:4,5). This is comparable to some previous reports of cases performed under similar conditions, i.e., using the bur technique under local anesthesia.

The difficulty reportedly encountered in decreasing order has been distoangular, horizontal, vertical and mesioangular in our study . Chiapasco et al [2] in their study reported 6.5% complication rate in association with distoangular impaction as opposed to 2.7% of vertical impaction. They concluded that this observation could be a reflection of surgical aggressiveness that is associated with this type of impaction. However our findings contradicted those of Monaco G et al [27] found no association between duration and type of the extraction and post operative complications. These contradiction could be due to the small number of samples or the different study setting and factors that were studied.

Further studies are needed to confirm the predictive factors described in our study. To enhance the statistical analysis of the present study and minimize bias, the methodology employed

in our study was different from that reported in similar previous studies [2,5,17,21,22,29] in terms of being more specific with age grouping (18 to 40 years in six age group),Winter's classification, Pell and Gregory Class I-B . Based on the findings of the present study, short-term outcomes of third molar surgery (swelling, trismus and pain) differed depending on the characteristics of the patient age. Surgery characteristics, such as operating time and type of impaction were also associated with postoperative variables. However, due to the clinical observational nature of the study and small sample size could be consider as limitation of the study

Conclusion

In conclusion ,we consider inflammatory complications after third molar surgery still remains an important factor in quality of life of patients at the early postoperative periods. Oral surgeons should be aware of the different modalities of alleviation of these complications to make postoperative recovery more comfortable for older patients. The short term outcome of the third molar operations such as pain, swelling and mouth opening differ depending on the patient's characteristics such as Age and depth of impaction. Further megatrail studies will help to elucidate the true nature and magnitude of the association. The type of impaction is developmental and cannot be controlled but the knowledge could assist in objective education of patients on possible postoperative reactions for medico- legal reasons.

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