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Original Article

Dentistry Section

Grading of Extraction and Its Relationship with Post-operative Pain and Trismus, along with Proposed Grading for Trismus

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ABSTRACT

Background: Extraction of mandibular third molars are somewhat a matter of interest because of its malpositioning , curved roots, proximity to vital structures due to this the procedure is often associated with post operative complications like pain and trismus. The extraction of third molar was classified in four grads according to the difficulty of the procedure.

Aims: The purpose of this paper is to find any significant relationship between grading of extraction and post operative complications like pain and trismus.

Materials and Methods: A total number of 180 patients need to go for extraction of third molar was included in the study. The variables taken into account were grading of extraction, pain six hour post operatively trismus one day after extraction, and trismus five day after extraction. The four grades of extractions as described by Parent in 1974 were statistically analyzed by computing pearson product moment correlation coefficient with post operative pain and trismus first and fifth day to find any co relation between them.

Results: The grading of extraction was found significantly correlated with post operative pain, trismus one day after and fifth day of surgery.

Keywords: Dental, Extraction, Third molar

INTRODUCTION

Extraction of mandibular third molar is a common practice in dentistry. As mandibular third molar is the last tooth to erupt, due to reduced space between mandibular second molar and ramus of mandible, most of the times it is malaligned, impacted, with hooked or curved root. Mandibular third molar's proximity to inferior alveolar canal, position of external oblique ridge as well as impaction status make its extraction more venerable for post-operative complications [1] like pain, swelling and trismus. Not only anatomical factors but bone cutting, sectioning of tooth, flap design [2-4] use of chisel or rotary instrument [5] time taken for surgical procedure [6,7], difficulty of tooth removal and factors associated with operator are also accountable for incidence of complications.

Parant, in his paper, classified difficulty of removal of third molar in four grades [8]. Grade I, GradeII, Grade III Grade IV.

These grading are much of practical value as they reflect the difficulty of extraction and chances of damaging adjacent vital structure. Grade I extraction, by means of simple forceps, are convenient and with less chances of damaging the adjacent vital structure while grade IV which is complex extraction usually performed in the teeth with unusual positions or with dilacerations or in ankylosed tooth. Extraction of such teeth requires excessive bone cutting with risk of damaging adjacent vital structure. This damage to adjacent vital structure sometimes leads to unwanted post-operative events like post-operative pain, alveolar osteitis, trismus and infections. Post-operative pain and trismus are the two important post-operative complications which affect the day to day activity of the patient. The purpose of this paper is to find out any significant relationship between grading of extraction and Post-operative pain and trismus so that by assuming the grade of extraction we can predict the occurrence of post-operative events.

MATERIALS AND METHODS

The study was done in the department of dental sciences, Sri Ram Murti Smarak Medical College Bareilly from December 2009 to November 2013. In this prospective study 180 consecutive patients presented for third molar extraction, fit in inclusion criteria were included. Patient's brief history and examination details were recorded in a specially designed perform for this purpose. Patients with thyroid disorders, pregnant ladies, women on oral contraceptives [9] uncontrolled diabetics, uncontrolled hypertensive, cardiac patients and patients with chronic renal disease were not included in the study because alteration in post op drug regimen can cause bias. Patients included in the study were advised not to smoke (if they were smokers) at least for three days before surgery to one week after surgery as López-Carriches C et al.,[10] found that smoking increases chances of trismus. All the patients taken for study were medically fit and with a valid reason for extraction of third molar.

Before extraction all patients were asymptomatic or made asymptomatic by the use of standard antibiotic and analgesics protocol. Surgical procedure was performed by the same surgeon under inferior alveolar and long buccal nerve block by using 1.8 ml 2% lignocain with 1:200000 adrenalin added to it. Extraction was done either by close method or by surgical removal according to the need and difficulty of extraction was recorded according to parent scale [Table/Fig-1].

Extraction wound was closed by the use of 3'0 silk suture. Standard post-operative antibiotic and analgesic regime followed for five days post-operatively.

Pain was measured at six hour post-operatively on VAS scale on which 0 denote no pain and 10 denote maximum pain. Maximum inter-incisal distance was measured with a caliper just before the

procedure and one and five days after surgery by the same person. Patients were asked to open the mouth as wide as possible and the distance between upper and lower incisors was measured.

Trismus also classified into four grads as following and recorded accordingly one and five day after surgery [Table/Fig-2].

These four grades of extractions were than statistically analyze with Post-operative pain and trismus first and fifth day by using pearson's co relation test to find any significant relationship between them.

RESULTS

The data was organized and analyzed by using SPSS 21 software. Total number of subjects analyzed was 180 (n=180). A pearson product moment correlation coefficient was calculated to assess these relationship between variables (grading of extraction, pain six hour post-operatively, trismus one day after procedure, trismus 5th day of procedure). There were significant correlations found between grading of extraction and pain score six hours post-operatively (r=.494, n=180 p=.000), between grading of extraction and presence of trismus one day after surgery (r=.481, n=180 p=.000) and between grading of extraction and presence of trismus fifth day of surgery (r=.184 n=180, p=.013). However in this study no significant relationship was found between age of patient and any of these variables. Interestingly the results of this study also establish a significant relationship between pain 6 hours post-operatively and presence of trismus one day (r=.541, n=180, p=.000) and five day post-operatively (r= .233, n=180, p=.002) [Table/Fig-3].

DISCUSSION

Extraction of mandibular third molar is a procedure routinely performed in dental practice and sometimes procedure is also associated with unwanted post-operative events. Many studies showed a significant relationship of many pre-operative variables with post-operative complications. This study was performed to find if there is a relationship between grading of extraction of third molar with post-operative complications like pain and trismus.

The findings of this study shows a direct co-relationship between grading of extraction and pain 6 hours after extraction the possible cause of this finding may be that as the grading of extraction

Grade I	Extraction performed by forceps only
Grade II	Extraction performed by osteoctomy
Grade III	Extraction performed byosteoctomy and coronal sectioning
Grade Iv	Complex extraction.

[Table/Fig-1]: Parent scale of grading of extractions of mandibular third molar

Grade I	1%-33% reduction of maximal incisor distance Post-operatively
Grade II	34% to 66%reduction of maximal incisor distance Post-operatively
Grade III	66% to 100 % reduction of maximal incisor distance Post-operatively

[Table/Fig-2]: Proposed grading of trismus

increases possible trauma to adjacent vital tissues also increases and also retraction and handling of tissue results into inflammation and release of prostaglandins that causes more pain to the patient. Grading of extraction is also found to be directly related to trismus one day post-operatively. Same findings were suggested by Garcia A et al.,[11], de Santana-Santos et al.,[12] in their study. This may be due to damage of local tissue, bone cutting results into local swelling of tissues, prolonged mouth opening in complex extraction resulting spasm of muscle and stripping of muscle fibers due to mucoperiosteal flap elevation resulting into myositis of messater muscles well. The results also show that trismus also significantly related to pain score 6 hours post-operatively the cause behind this may be protective spasm of muscles which prevents stretching of muscle when pain receptors are activated the findings of Pedersen

		Grading of extraction	Pain score 6 hour post op	Presence of trismus one day post op	Presence of trismus fifth day	Age
Grading of extraction	Pearson correlation Significancy N	1 180	494 .000 180	.481 .000 180	.184 .013 180	-.040 .596 180
Pain score 6 hour post op	Pearson correlation Significancy N	.494 000 180	1	.541 .000 180	.233 .002 180	.022 .768 180
Presence of trismus one day post op	Pearson correlation Significancy N	.481 .000 180	.541 .000 180	1	.438 .000. 180	-.073 .330 180
Presence of trismus fifth day	Pearson correlation Significancy N	.184 .013 180	.233 .002 180	.438 .000 180	1	-.095 .205 180
Age	Pearson correlation Significancy N	.40 .596 180	.22. 768 180	-.73 .330 180	-.095 .205 180	1

[Table/Fig-3]: showing level of significance calculated by pearson correlation test between variables

A [13] justify that as they in their study found a strong interrelation between post-operative pain and trismus and so they concluded that pain as the main reason for reduced mouth opening after removal of impacted mandibular third molars. Bienstock DA, et al., [14] in their study describe that the study results suggest that third molar removal is associated with a mean delay in returning to normal activities of less than two days.

Baqain ZH et al.,[7] in their study found that post-operative morbidity increases with longer procedures. A similar finding was obtained in the study of Garcia A et al.,[11] that Trismus is less severe after simple (forceps-only, grade I) extractions than after surgical extractions (grades II to IV) and pain also is likewise less severe after simple extractions. Lago-Méndez L et al.,[6] in their study also concluded that there is a statistically significant relationship between surgical difficulty (as rated on scale, grade I,II,III,IV) and post-operative pain. The grading of trismus in this study shown to be continuously decreased from first day to the fifth day and it is found associated with grading of extraction. It is quite predictable because the healing process and associated functional movements and post-operative medications that cause reduction of pain and inflammation as well.

However, in this study age seems to have no direct significant co-relation with any of the variable. This is in contrast to the findings of Bello SA et al.,[15], Baqain ZH [7], suggested that post-operative morbidity increases significantly with age progression. However, there is reduction in resiliency of bone as age increases but it is not found significantly related to any variable of this study.

CONCLUSION

In this study, authors also proposed grading scale of trismus. This grading system is according to percentage reduction of mouth opening provides a scale that is not only helpful for analysis but also helps in classifying the patient in clinical practice. Further practice of the scale in future studies will help to establish the practical importance of this grading scale.

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