



Quality of Life after Third Molar Removal in Subjects with Pericoronitis

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Authors' contributions

This work was carried out in collaboration between all authors. Author KVR designed the study, performed the statistical analysis, wrote the protocol and first draft of the manuscript. Authors GJ and SB managed the analyses of the study. Author SB managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aims: To assess the quality of life outcomes after third molar surgery in patients with symptoms of pericoronitis in Indian population.

Place and Duration of Study: Department of Oral and Maxillofacial Surgery, Army College of Dental Sciences, Secunderabad, between in the time period of May 2016 to April 2017.

Methodology: 200 Patients in the age group of 18-35 years with impacted mandibular teeth as a risk indicator with pericoronitis were included in the study. All the patients were assessed for the Presence of pain, Inter incisal opening, Presence of Swelling, affect on the daily routine activities like going for work/college, difficulty in taking part in social life, difficulty in chewing and sleeping difficulty in participation in recreational activities like sports before surgical removal of third molar removal, on the day of surgery and post operative day 1, 3, 5, 7 and day 21.

Results: This study revealed a statistically significant difference in oral health-related quality of life at 21 days interval after surgical removal of lower third molar when compared with preoperative status with respect to all the parameters.

Conclusion: This study concluded that third molar surgery is associated with an

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improvement in quality of life in the long term but with a deterioration of life quality in the short term (immediate postoperative). Removal of the third molars positively influenced the quality of life outcomes in patients with symptoms of pericoronitis.

Keywords: *Quality of life; pericoronitis; tooth removal.*

1. INTRODUCTION

In oral and maxillofacial surgery, there are various conditions that can have an impact on patient's quality of life and pericoronitis affecting mandibular third molar being one of them. Pericoronitis is defined as inflammation of the oral soft tissues surrounding the crown of an erupted or partially erupted tooth, accompanied by pain for many days [1]. It is a painful, incapacitating infection that is most commonly found among young adults and accounts for approximately 10% of the third molars extracted [2]. Surgical removal of third molar affected with chronic pericoronitis is accompanied by various sign and symptoms which can have a negative as well as a positive impact on patient's quality of life.

The term quality of life is used to assess the well-being and the effects of various treatments carried upon patients [3]. It is difficult to measure, as it means different things to different people and mainly depends upon the patient's own perception. The results for the assessment of quality of life are influenced by psychological aspects, a social dimension of the patient towards the surroundings and how far can they continue to live a normal, healthy life [4].

In a country like India with low socioeconomic status, it becomes difficult for the subjects suffering from pericoronitis to undergo third molar surgery owing to the immediate post operative sequelae which has a physical, social and psychological effects on their quality of life. The procedure has an impact on their lifestyle as well as means of income specially in the immediate post operative period. So far, no studies have been conducted for the same in India. Thus, in view of the above discussion, the present study was carried out to assess the quality of life outcomes after third molar surgery in patients with symptoms of pericoronitis in Indian population.

2. MATERIALS AND METHODS

2.1 Sample Size

200 Patients with impacted teeth suffering with chronic pericoronitis reporting to the outpatient

Department of Oral and Maxillofacial Surgery, Army College of Dental Sciences, Secunderabad in the time period of May 2016 to April 2017.

2.2 Inclusion Criteria

1. 18-35 years
2. Patients with partially erupted Mandibular third molar affected with chronic pericoronitis
3. Patients with symptoms of pericoronitis (swelling, pain, limited mouth opening, purulent or drainage affecting mandibular third molar)

2.3 Exclusion Criteria

1. Patients with symptoms of acute pericoronitis (Fever {Temperature>101 degree F}), dysphagia, facial swelling/cellulitis, severe uncontrolled discomfort.
2. Patients with generalized periodontal disease.
3. Pregnant patients.
4. Patients with Hypertension and Diabetes Mellitus.
5. Immuno compromised patients (Blood Dyscrasies, Tuberculosis, Human Immuno Deficiency Virus positive, Renal disorders)

3. METHODOLOGY

All the subjects were examined with a mouth mirror and a No. 3 explorer. The history of symptoms of the affected mandibular third molar was recorded and a thorough clinical examination was carried out.

All extractions were carried out under local anaesthesia. The surgical field and all the surgical materials used were completely sterile. Crevicular incision with distal releasing incision was given using 15 no blade. The buccal mucoperiosteal flap was raised and protected using Minnesota retractor. Lingual flap was also raised wherever necessary and was protected using Howarth's periosteal elevator. Sterile high speed hand piece and normal saline were used for ostectomy and crown sectioning. Wound

Closure was carried out using 3-0 silk sutures. An antibiotic (Tablet Amoxicillin 500mg) and Non steroidal anti-inflammatory drug (Tablet combiflam for surgeries with time duration of 40 minutes and less and Tablet Diclofenac 50 mg) both three times daily for 5 days along with 0.12% chlorhexidine digluconate rinses 4 times a day for 21 days were prescribed post operatively. Suture removal was carried out after 7 days. All the patients were called on immediate post surgery day and thereafter every alternative day upto day 7 and lastly on day 21 for the assessment of post operative sequelae of surgical removal of third molar.

All our patients were present at the time of follow up upto day 21.

Parameters Evaluated

Following parameters were evaluated before surgical removal of third molar removal on the day of surgery and post operative day 1, 3, 5, 7 and day 21

1. Presence of pain using Visual Analog Scale.
2. Inter incisal opening
3. Presence of Swelling
4. Affect on the daily routine activities like going for work/college
5. Difficulty in taking part in social life
6. Difficulty in chewing and sleeping
7. Difficulty in participation in recreational activities like sports

All the patients were asked to fill a questionnaire comprising the above mentioned parameters. Questionnaire was based on questionnaire reported to evaluate quality of life after third molar extraction, which was modified. Pain ratings were scored on a 10 cm horizontal Visual Analog Scale which was divided into 10 equal parts, the end points being marked as —no pain and —most severe pain. A score for the most intense pain was recorded. Swelling was measured as distance from corner of mouth to angle of mandible antero- posteriorly and from infraorbital margin to inferior border of mandible superio- inferiorly in cm using measuring tape.

Mouth Opening ability was recorded with a ruler where the distance between the incisal edges of upper and lower left central incisors was measured at maximal opening without any difficulty.

Ethical clearance was obtained from the institutional ethics committee of Army College Of Dental Sciences, Secunderabad.

3.1 Data Analysis

The data obtained was processed using computer programme, statistical package for Social Sciences version 18. Results were subjected to statistical analysis using Mann Whitney U test and Wilcoxon matched pair test.

A p value of <0.5 was considered statistically significant.

4. RESULTS

In our study, mean age of all 200 patients in our study was 25.87years. The age group included 94 males (47%) and 106 females (53%). It was seen that females outnumbered males with respect to pain in the previous week before surgical removal of lower third molar.

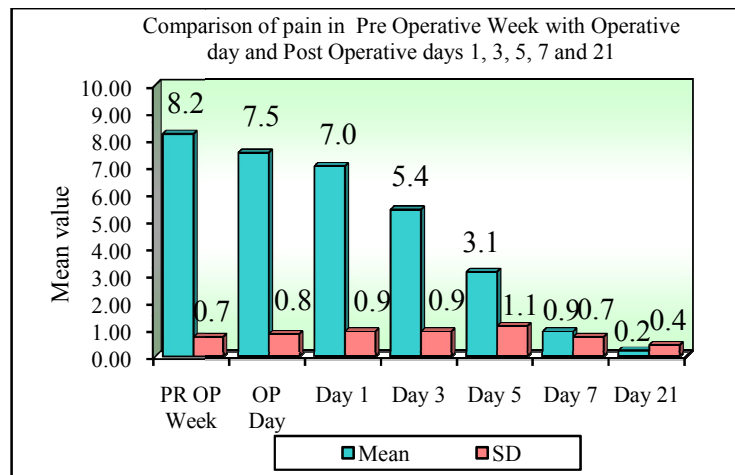
The most frequent position of the third molar encountered in our study according to the classification of Winters [5] and Pell and Gregory [6] was Horizontal class II position B Graph 1. Effect of pain was evaluated and our results reflected that score for pain during previous week before surgical removal of mandibular third molar was significantly higher than on the day of surgery and post surgery follow up days upto day 21.

Graph 2. Our results depict that the score for mouth opening on the operative and post operative day 1 was higher than the score in the previous week and the next post operative day's upto day 21.

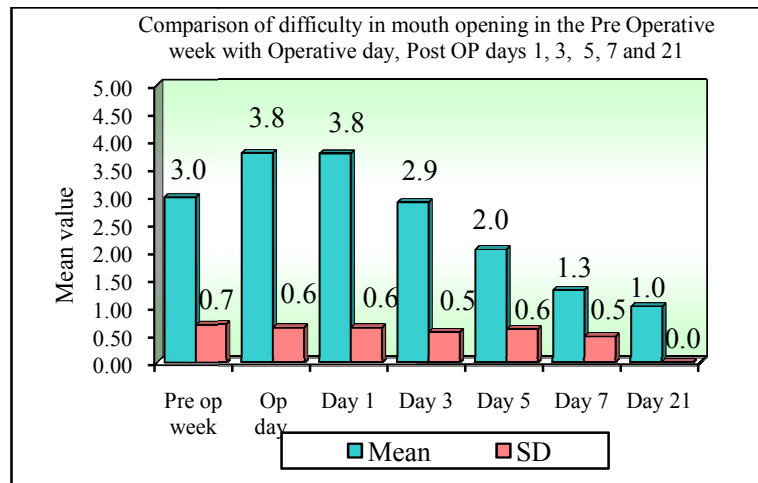
Graph 3. Most of our patients (78%) reported with difficulty to chew food in the previous week before surgery. The difficulty was present on the day of surgery and the immediate post operative day. There was a significant improvement in ability to chew by the end of first week.

Graph 4. Effect on going to work before and after surgical removal of third molar was evaluated and an overall significant difference in the mean score for difficulty in going to work was obtained.

Graph 5. Our results depict that most of our patients (86%) did not face any difficulty in sports activities after day 3. This suggested an improvement in the quality of life with respect to sports.



Graph 1. Comparison of pain in pre operative week with operative day and post operative days 1, 3, 5, 7 and 21



Graph 2. Comparison of difficulty in mouth opening in the pre operative week with operative day, post op days 1, 3, 5, 7 and 21

Our results also confirmed that score for difficulty in having social life on the operative and the immediate post operative day was higher than the previous week. There was a gradual decline in the score from post operative day 3 upto the last follow up day indicating an improvement in the quality of life with respect to social life. Most of our subjects faced difficulty in sleeping on day of surgery and on immediate post operative day. Difficulty declined after post operative day three indicating a better quality of life.

4. DISCUSSION

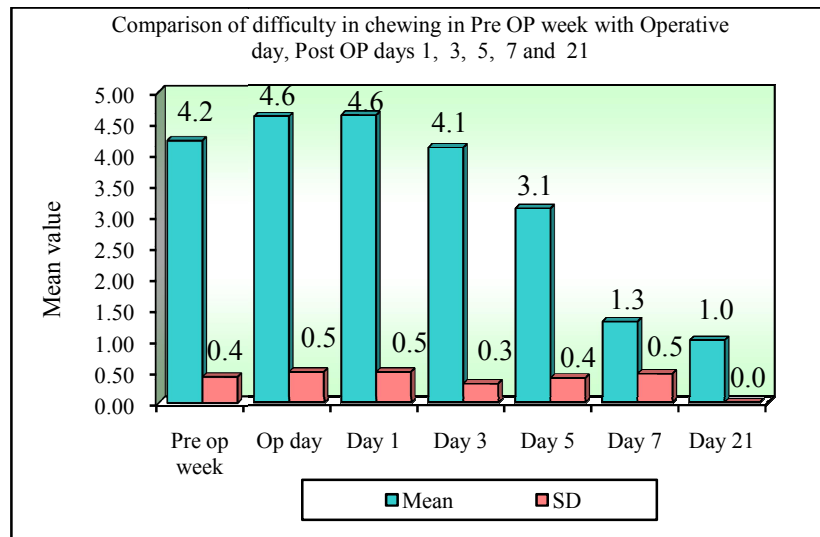
The term Pericoronitis is derivative from the word peri-around, and corona-crown, and thus it

means inflammation around the crown of an erupted or partially erupting tooth [7]. It is generally accepted that pericoronitis can affect patients of any age, but it is more frequently seen in the 18-28 yea age group; possibly the time when the third molar makes the maiden entry into mouth. B. Eklund and Pittman reported that most third molars were removed between 15 and 25 years of age with a peak at 18. Most of our patients were females (53%) which is similar to the study conducted by Goldberg and Osborn et al [9]. This is also in accordance to the study conducted by Abdalla Hazza's in which 55.4% patients reported with pericoronitis were females and 44.6% patients were males [10]. The higher frequency of impacted third molars in female

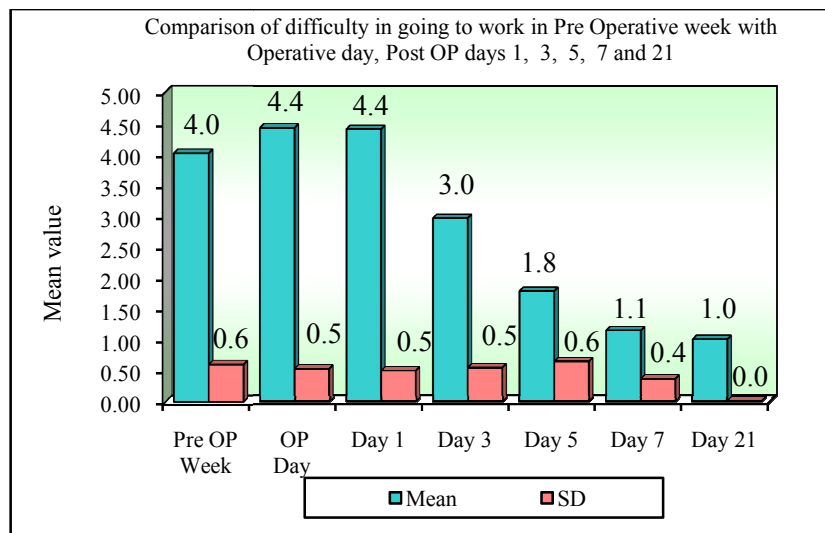
patients could be as a consequence of their jaws that stop growing when the third molars just begin to erupt in contrary to males in whom the growth of the jaws continues beyond the time of eruption of third molars [11,12]. The results for pain in our study were similar to the study done by White et al. which reported more than half of the patients experienced their worst pain as severe on Post Operative Day 1 [13] and for most of the subjects pain subsided by 7th post operative day. Pain subsequently diminished throughout the study period with a clear linear

pattern. The discrepancy for pain could be attributed to several factors including difference in post operative medication, individual pain threshold, psychological assessment, general health, individual pain perception, duration of surgery, difficulty of operation, and time of the day when surgery is performed.

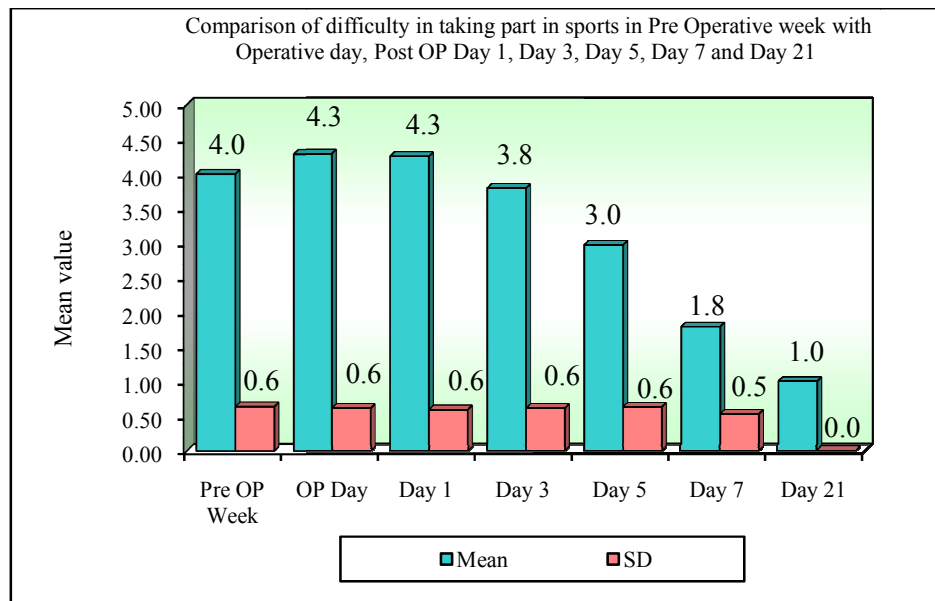
Long duration of pericoronitis can also be one of the contributory finding for the difference in the intensity of pain. Pre-existing infection may result in postoperative inflammatory complications



Graph 3. Comparison of difficulty in chewing in pre op week with operative day, post op days 1, 3, 5, 7 and 21



Graph 4. Comparison of difficulty in going to work in pre operative week with operative day, post op days 1, 3, 5, 7 and 21



Graph 5. Comparison of difficulty in taking part in sports in pre operative week with operative day, post op day 1, day 3, day 5, day 7 and day 21

related to the natural course of the infection. The presence of pathogenic bacterial inoculums at the surgical site intra- and postoperatively, could re-infect the surgical site and lead to more intense pain and for a longer duration.

All of our patients were taking medications for pain for first 5 post operative days. A more strong analgesic was prescribed to the patients whom surgery took longer time than 1 hour in comparison to those patients where it took 40 min or less. This could be another reason for the variance in pain experienced by patients. The frequency in the usage of medications for pain also accounts for the reported difference between the intensity of pain on VAS by our patients. Some patients used the prescribed analgesics as directed by the surgeon for the given number of days while others did not follow the same protocol.

Our study reflects that women experienced more pain than men in the previous week before surgery. No significant difference was found in the intensity of pain from the day of surgery till the next follow up days between men and women. This is in contrast to the study conducted by Shugars et al. where women reported longer recovery period than men for worst and average pain [14]. According to the study done by Robinson greater intensity of pain in women reflects that women experience pain

differently to men. [15,16] This could be attributed to the different sex related stereotypes and difference in the biologic mechanism present in both men and women [15,16].

All 200 patients in our study experienced swelling on the day of surgical removal of lower third molar. Swelling began to subside from 4th operative day but 6% of patients reported with swelling on 7th POD as well. This was in contrast to the results obtained by Bosch and Van Gool [17] where only 10% of patients experienced swelling on 5th POD. The increase in size of swelling could be related to the extended duration of surgery and the unintended damage to the soft tissues which leads to the release of inflammatory mediators at the surgical site.

In our study, restriction in mouth opening was present secondary to pain in most of the patients [3]. As a whole most subjects required 6-7 days for mouth opening to resume to normal level. This is in agreement with the study done by Shawn M Conrad et al. showing 78.5% of population experienced problems with mouth opening on the day of surgery [14]. Trismus has a number of potential causes. Surgical removal of teeth causes trismus as a result of inflammation involving the muscles of mastication either while administering mandibular nerve block or injury to the muscles

during the course of procedure. It could also be attributed to direct trauma to the TMJ.

Electromyographic study done by Greenfield, B. E. reflects that confined movements of mandible are present after the surgical removal of lower third molar. It implicates a voluntary act in order to avoid pain [18]. Similar results were also observed in our study.

The results for chewing in our study were similar to study conducted by J Savins and J. R. Ogden [4]. Difficulty in chewing and mouth opening was collectively associated with change in diet of the patients. Most of the patients were chewing from the non operated side and this contributed to the decrease in the enjoyment of food.

All the patients in our study took time off from work on the operative and first postoperative day. Almost half of subjects in our study experienced lots of difficulty in going to work the previous week as well. Also most of the patients experienced trouble in taking part in social life upto POD 3. The difficulty in taking part in social life reduced to 46% of patients having only a little trouble in taking part in social life on POD 7. This was similar to a study done by Conrad et al. [14] where social life was substantially affected in 61.5% of population on POD 1 decreasing to 14% by POD 5 respectively. This incapability of going to work and taking part in social life could be attributed to a combination of factors. The inability to work is positively associated with pain, dysphagia, sleeping problems, and difficulty in talking. Another reason which could be attributed to this was the presence of swelling which has an influence on comfort, function and aesthetics. There was a deterioration of self confidence in individuals which perhaps is one of the reasons for their inability to go to work and take part in social life.

Sleep was affected the least of the general activity measures after third molar surgery. Most of the patients (86%) in our study returned back to the normal sleep pattern by POD 3. Our results were in contrast to the study done by White et al. where 19% of population complained of interference in sleep pattern on POD 1 [13]. Sleep disorders could be due to pain, swelling and discomfort associated with the surgical removal of the tooth. All patients were informed not to sleep on the operated side on the day of surgery due to the presence of post operative oedema. Variation in body posture during sleep could be attributed to interference in sleep

pattern in our subjects. All of our patients were informed about sleep interruption as it could alter the ability to drive and change in their performance to use machines during their working hours [3].

16% of the patients in our study experienced some trouble in carrying out recreational activities like sports the previous week before surgery. The difficulty increased on the operative and on the immediate post operative day. Most of the patients in the present study took 5 days to return back to the state as before the surgical removal of third molar, similar to the results by Conrad et al. [14]. Pain and discomfort were the main reasons for their inability to take part in sports.

In our study, the median number of days to “no trouble” for all of the parameters except pain was achieved within 5 to 7 days after surgery. Most of the subjects started going for work, started taking part in social life and sports without much difficulty in talking within 5 days. All subjects resumed to normal sleep pattern within 3 days. However for most of the patients it took almost 7 days for normal mouth opening and resuming back to normal regular diet.

This study revealed a statistically significant difference in oral health-related quality of life at 21 days interval after surgical removal of lower third molar when compared with preoperative status. There were significant improvements across most of the parameters affecting the quality of life in patients with pericoronitis within the period of 21 days from the day of surgery with an absolute health gain. In attaining an improvement in oral health related quality of life for a longer period, almost all of our patients experienced a considerable reduction in life quality in the immediate postoperative period mostly in the first week. This has important implications with respect to the decision-making process of the surgical removal of lower third molar, in case patients are willing to experience a significant reduction in quality of life in the immediate postoperative period for a long-term improvement.

Our study demonstrated deterioration in life quality across a broad range of domains, expanding our understanding of the impact of third molar surgery beyond signs and symptoms. There was a sharp reduction in oral health related quality of life immediately following surgery (on the operative day to POD 5).

However there was a steady increase in recovery from there on. As to whether this trend of recovery or improvement in life quality continues and does so significantly over time warrants further research.

Patients viewpoint on outcomes of oral surgery is important in endowing the value of third molar surgery. Sometimes 'cure' is worse than 'disease', in terms of impact on quality of life. It is mandatory to identify such scenarios to inform policies and guidelines and to promote evidence based practice [19].

5. CONCLUSION

This study concluded that third molar surgery is associated with an improvement in quality of life in the long term but with a deterioration of life quality in the short term (immediate postoperative). Removal of the third molars positively influenced the quality of life outcomes in patients with symptoms of pericoronitis.

CONSENT

As per international standard or university standard written patient consent has been collected and preserved by the authors.

ETHICAL APPROVAL

Necessary ethical clearance was obtained from ethical committee of army college of dental sciences for carrying out the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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