Original Article

Impacted Third Molar Surgery and the Aviator

Kaushik SK[*], Gupta SK[+]

ABSTRACT

Wisdom teeth are the third and final set of molars that most people get in their late teens or early twenties. When impacted, these can cause a variety of problems, from severe orofacial pain, acute dysphagia, facial cellulitis to serious dental disorders. Surgical removal of impacted third molar is one of the commonest outpatient, day care, minor oral osseous surgical procedure undertaken by maxillofacial surgeons. This study was designed to examine the effect of presence of impacted third molar and clinical healing after third molar surgery on health-related quality-of-life recovery (HRQOL) amongst aviators. The study group included 84 aviators including 67 males and 17 females, age ranging from 24 to 41 years, in active flying, who reported for symptoms relating to impacted mandibular third molar and who subsequently underwent surgical removal. The parameters assessed were the level of impaction, the chronicity before removal, the frequency of recurrence of symptoms before removal, the average periodic persistence of symptoms, presence of pain, trismus, swelling, difficulty in swallowing, pain related disturbed sleep patterns Post operative parameters included were recovery period, improvement in oral function, swelling, need for pain relief medicament and protracted delayed healing. 63 subjects had more than three episodes of symptoms. The peak age group was 30 to 35 when most surgical removal was undertaken. Pain was the commonest symptom in 78 patients, trismus in 36, difficulty in swallowing in 18, pain related altered or disturbed sleep patterns in 27 cases. Healthy soft tissue closure and improvement in oral function after removal of intra oral sutures at the end of first post operative week was seen in 77 cases and complete post operative recovery was seen in 80 cases at the end of two weeks. Two patients (2%) required debridement and secondary closure and in two patients (2%) there was altered neurosensory function which improved by eight weeks. The presence of symptomatic impacted third molar compromises the quality of life and an early removal is recommended for the quick recovery and return to professional activities in the aviators. In the absence of guidelines on the issue of impacted third molar surgery, it is proposed that as a rule of thumb, at least a fortnight of abstinence from active flying for comprehensive healing of bony surgical wound is mandatory with individual case variations based on post operative findings.

IJASM 2010; 54(1): 26-31

Key Words: Impacted Third Molar, Surgery, Aviator

Introduction

Impacted teeth are defined as those teeth whose normal eruption is either prevented by adjacent teeth or bone, malpositioning and lack of space in the dental arch or some other impediments. Teeth may become impacted when they fail to erupt or develop into the proper functional location. As such, impacted teeth are considered nonfunctional, abnormal, and pathological. The mandibular third molar is the most common tooth to become impacted. Impacted third molars are often associated with pain, pericoronal infection, cyst formation, benign tumors, root resorption, bone loss, periodontal disease, dental caries and subsequently secondary facial space infections. The decision for surgery will be assisted by an understanding of all of the risk factors associated with impacted teeth and presenting the options to the patient. Most experienced clinicians combine objective data and common sense to arrive at a logical treatment plan.

When a pilot sits in the cockpit, he or she methodically goes through a checklist of all systems and equipment before the plane is fired up. Even if the pilot has flown that plane and route many times,

[*]Classified Specialist (Maxillofacial Surgery) AFIDS, Bangalore-560 017

[+]Classified Specialist (Prosthodontics), CO 1 AFDC, Palam, New Delhi

the items on the checklist are reviewed one by one and no-one would think of flying the plane without completing the checklist. The same holds good for the medical evaluation for a flying pilot. An applicant for any class of medical assessment for flying branch shall be free from:

(a) Any abnormality, congenital or acquired;

(b) Any active, latent, acute or chronic disability;

(c) Any wound, injury or sequelae from operation;

(d) Any effect or side-effect of any prescribed or non-prescribed therapeutic,diagnostic or preventive medication taken.

The incidence and prevalence of impacted third molar being of a universal phenomenon, the aviators are a sub sect of the general population, but the uniqueness of the situation unlike the larger society is in terms of the related symptoms and affliction and the outcome for optimum performance of primary flying duties. Even though the impacted tooth rarely causes life threatening severe neck space infection and the mere presence is no indicator of the chance of the symptoms to occur, there is increased propensity for the health related quality of life to be altered in times of bouts of recurrence. Therefore on all the four accounts of the above stated criteria for medical assessment the presence of impacted tooth when symptomatic is a clear indication for surgical removal.

The operation is a day care, out patient, minor, intra oral trans osseous surgery manipulating the alveolar bone leaving an empty bony socket closed by primary soft tissue closure. Surgical removal of third molars is often associated with postoperative pain, swelling, and trismus. Factors thought to influence the incidence of complications after third molar removal include age, gender, medical history, presence of pericoronitis, poor oral hygiene, smoking, type of impaction, relationship of third molar to the inferior alveolar nerve, surgical operating time, surgical technique, surgeon's experience, use of peri operative antibiotics, use of topical antiseptics, use of intra-socket medications and anesthetic technique. It is therefore imperative that during the post operative period, enough recuperating rest and convalescence period is given for satisfactory uneventful physiologic healing of the bony wound. This is of prime concern in this unique group of subjects due to the demanding occupational conditions including the wearing of various facial gadgetries like mask, helmet and radio speakers, radio transmission verbal communication, extremes of physiologic and physical stress including positive G, temperature, complex maneuvers, etc.

The scope of the study dwells into the symptomology of presentation and the alteration of health related quality of life amongst the flying pilots reporting with impacted mandibular third molar.

Material and Methods

The design is a retrospective descriptive cohort study with subjects included being flying branch officers of all the three forces Army, Navy and Air Force including Flight test engineers treated by the author from Jun 2003 to Jun 2009 at tertiary care Dental centres including both primary reporting as well as secondary referrals for symptoms related to impacted mandibular third molar. A detailed history was recorded regarding the number of bouts and chronicity of the symptoms and a thorough clinical examination was undertaken. The need for surgical removal was classified broadly under two groups:

***(a) Dental caries and its consequences*:** Grossly carious tooth, periapical lesion, failure of

restoration, deep root caries etc.

(b) Eruption problems: Impacted tooth, pericoronitis, cheek bite, no opposing tooth, pressure on the adjacent teeth, impinging on opposing soft tissues, food impaction in area, eruption buccally or lingually, pericoronal abscess.

All patients had a standard peri apical radiograph of their impacted molars taken and reviewed by transillumination using a fluorescent radiograph view box. The radiographic features recorded were as follows:

(a) **State of eruption**

(i) **Fully erupted tooth**: Its crown could be seen totally in the mouth.

(ii) **Partially erupted tooth**: It has penetrated the oral mucosa and is partially visible in the mouth.

(iii) **Completely unerupted tooth**: The tooth has not penetrated the oral mucosa.

(b) **Ramus relationship (Class I, II, or III)**

(i) Class I: Sufficient space

(ii) Class II: Reduced space

(iii) Class III: No space

(c) **Depth of impaction (Type A, B, or C)**

(i) Type A: The highest portion of the mandibular third molar is level with or above the occlusal plane.

(ii) Type B: The highest portion of the mandibular third molar is below the occlusal plane but above the cervical line of the second molar.

(iii) Type C: The highest portion of the mandibular third molar is below the cervical line of the second molar.

(d) Tooth angulation (Mesioangular, Horizontal/ Transverse Vertical, Distoangular)

(e) Root curvature (favorable or unfavorable)

(f) Root divergence (fused, modest, or excessive)

(g) Number of roots

(h) Periodontal membrane space (normal, widened, or obliterated)

(i) Relative horizontal position (lingual or buccal tilt)

(j) Proximity to the inferior alveolar nerve (distant or close)

Surgical Procedure

All extractions were performed under local anesthesia under standard aseptic operating protocol. A three-sided mucoperiosteal flap was raised in all cases to completely expose the tooth followed by bone relief using the buccal guttering bur technique under continuous irrigation with sterile normal saline. Tooth delivery was done using Coupeland's elevators and/or dental extraction forceps. Crown sectioning was done in cases where the path of delivery was obstructed by the adjacent second molar. Thorough toileting of the surgical site was done following tooth delivery and the flap was replaced and sutured with two black silk sutures. The operative time was recorded in all cases by a trained assistant using a stopwatch. The recorded time included the period between the beginning of the incision to the placement of the last suture. At the end of the procedure, patients were placed on prophylactic antibiotics and analgesics. Postoperative instructions were given to all patients. Immediately after surgery the operative time was recorded and actual surgical experience of difficulty was determined based on arbitrary time ranges selected as follows:

(a) Slightly difficult = 20 minutes or less

(b) Moderately difficult = 21–40 minutes

(c) Very difficult = more than 40 minutes

Post operative review was done second day post op and after one week for removal of sutures of all the subjects and evaluated for signs and symptoms including pain, swelling, trismus, difficulty in chewing, altered neurosensory function, alveolar osteitis, dry socket, post operative secondary infection and suppuration. Pain was evaluated on a seven point scale of none, little, mild, moderate, severe, extremely severe and unbearable. Lifestyle and oral-function outcomes were assessed using a 5-point Likert-type scale, with anchors of numerical rating scale as follows :- 1 (Never/ no trouble), 2 (Hardly ever/ some trouble), 3 (Occasionally/quite troublesome), 4 (Very often/ very troublesome) to 5(Fairly often/ lots of trouble)

Results

The study group included 84 aviators including 67(80%) males and 17(20%) females, age ranging from 24 to 41 (Mean 32.4) years and who were involved in in active flying. The peak age group was 30 to 35 when most surgical removal was undertaken. 63 (75%) subjects had more than three episodes of symptoms. Pain was the commonest symptom in 78 (93%) patients, trismus in 36 (43%), difficulty in chewing and swallowing in 18 (21%), pain related altered or disturbed sleep patterns in 27 (32%) cases. 69 (82%) were pure impacted teeth and the remaining 15 (18%) were with dental caries 46 cases (55%) were performed with slight difficulty within 20 minutes, 29 cases (35%) were performed with moderate difficulty within 40 minutes and in 9 cases (11%) the procedure took more than forty minutes Two patients required debridement and secondary closure and in two patients there was altered neurosensory function which improved by eight weeks. On a scale of pain threshold of 7 twenty-eight percent of subjects described their worst pain on the first post op day as severe (5-7), 40% as moderate (3-4), and 32% as none/little (1-2). Average pain on the first post op week during suture removal was described as severe (5-7) for 4% of subjects, as moderate (3-4) for 40%, and as none/little (1-2) for 56%.Healthy soft tissue closure and improvement in oral function on removal of intra oral sutures at the end of first post of week was seen in 77 (92%) cases and complete post operative recovery was seen in 80 (95%)cases at the end of two weeks. Subjects reported “quite a bit/lots” of difficulty (4-5) with oral function (23% with eating, 19% with chewing, and 6% with opening) and “quite a bit/lots” of difficulty (4-5) with lifestyle (sleeping, social life, and sports/hobby, all at 2%).

Discussion

The cause of impacted third molars is thought to be inadequate space. Mismatch of the dental arch length and tooth size may occur due to the

Table 1 : Radiographic Evaluation of Impaction Ramus relation and Depth

Type/ Class	Class I	Class II	Class III	Total
Type A	41	11	4	56
Type B	9	5	2	16
Type C	7	4	1	12
Total	57	20	7	84

Table 2: Distribution of Health Related Quality of Life Items

Item	Description of item How often have you had problems with your wisdom tooth	Distribution of responses 1	2	3	4	5
1	Pain	6 (7%)	11(13%)	44 (52%)	13 (15%)	10 (12%)
2	Swelling	7 (8%)	13 (15%)	39 (46%)	16 (19%)	9 (11%)
3	Difficulty in chewing	3 (4%)	5 (6%)	55 (65%)	16 (19%)	5 (6%)
4	Cheek bite and traumatic wound	14 (17%)	17 (20%)	42 (49%)	6 (7%)	5 (6%)
5	Restriction of mouth opening	15 (18%)	21 (25%)	37 (44%)	7 (8%)	4 (5%)

1 Never, 2 Hardly ever, 3 Occasionally, 4 Very often 5 Fairly often

inheritance of large teeth and small jaw size as in miscegenation. Several studies also indicate that a change from a coarse, fibrous, attritive diet to a modern, refined diet has lead to an increased incidence of missing third molars and if present, may turn out impacted. It may be that the area is just overcrowded and there is no room for the teeth to emerge. Teeth may also become twisted, tilted, or displaced as they try to emerge, resulting in impacted teeth. A partially emerged tooth can trap food, plaque, and other debris in the soft tissue around it, leading to inflammation and tenderness of the gums and unpleasant mouth odor clinically recognized as pericoronitis. Pericoronitis is a chronic condition with a high recurrence rate of acute exacerbations. Most of the patients affected by pericoronitis experience only a mild discomfort, but it may cause an acute illness with severe pain, dysfunction, systemic upset and serious complications. Symptomatic pericoronitis can have adverse outcomes, compromising the quality of life and inflicting pain. It is generally accepted that pericoronitis can affect patients of any age, but it is more frequently seen in the 18-28 year age group perhaps the time when the third molar makes the maiden entry into mouth. The marked difference between the male and female ratio in the present study may be explained by the ratio of males to females who are in active flying branch. Treatment of signs and symptoms of pericoronitis in a mandibular third molar area is towards reducing the pain and improvement of trismus and reduction of swelling if any.

The most frequent complications after surgical removal of an impacted mandibular third molar are the following: alveolar osteitis, infections, neurological damage involving the inferior alveolar and lingual nerves. All of these postoperative complications are more frequent in older patients starting at about 25 years of age. Alveolar osteitis is the most frequent postoperative complication, but it is easily handled; its pathogenesis remains unknown, even if cigarette smoking enhances its incidence; other putative risk factors have not been confirmed. An effective etiologic therapy is not yet available, but the symptoms can be managed by means of local medication. Postoperative infections can still cause very severe problems, especially in elderly patients, if the treatment is not correct and timely. Antibiotic prophylaxis is indicated in selected cases. The possibility of neurological complications is often associated with anxiety both in the patient and doctor: Fortunately, their incidence has been lowered by improved surgical techniques. Moreover, risk indicators have been identified on the panoramic radiographs; three-dimensional imaging is useful in planning the surgical intervention in risky cases. Both clinical and radiologic variables are important in predicting surgical difficulty in impacted

mandibular third molar extractions. The soft tissues at highest risk of developing pericoronitis are those adjacent to mandibular third molars that are partially erupted, in a vertical position, and erupted to the level of or above the occlusal plane.

Akin to the general population the healing and surgical outcome in the aviator is indifferent but peculiarity is in terms of the quick reverting back to optimum professional flying duties. The point to be appreciated is that the procedure is under local anesthesia as a chair side day care outpatient surgery and the patient is disposed with regards to rest and convalescence without hospitalization or flying categorization which is indeed justified bearing in mind the minor oral surgery and the healing time. But on the contrary it is a bony surgical wound and necessitates good soft tissue healing of intra oral socket wound and warrants enough time for recovery from the procedure and the associated symptoms of pain, difficulty in mouth opening, altered feeding to soft diet before undertaking any active flying activities.

The presence of symptomatic impacted third molar compromises the quality of life and an early removal is recommended for the quick recovery and return to professional activities in the aviators. In the absence of guidelines on the issue of impacted third molar surgery it is proposed that as a rule of thumb, at least a fortnight of abstinence from active flying for comprehensive healing of bony surgical wound is mandatory with individual case variations based on post operative findings.

Conflict of Interest - none

References

1. Bataineh A, Albashaireh Z, Hazza'a. The surgical removal of mandibular third molars: A study in decision making. Quintessence Int. 2002; 33: 613-17.
2. Director General of Civil Aviation. Medical requirements and examination for flight crew licenses and ratings - Civil Aviation Requirements. Section 7 Series 'C' Part I Rev. 2, 2006
3. Clauser B, Barone R, Briccoli L, Baleani A. Complications in surgical removal of mandibular third molars. Minerva Stomatol. 2009; 58(7-8): 359-66.
4. Akadiri OA, Obiechina AE. Assessment of difficulty in third molar surgery-a systematic review. J Oral Maxillofac Surg. 2009; 67(4): 771-4.
5. Akadiri OA, Okoje VN, Arotiba JT. Identification of risk factors for short-term morbidity in third molar surgery. Odontostomatol Trop. 2008 ; 31(124): 5-10.
6. Van Wijk A, Kieffer JM, Lindeboom JH. Effect of third molar surgery on oral health-related quality of life in the first postoperative week using Dutch version of Oral Health Impact Profile-14. J Oral Maxillofac Surg. 2009; 67(5): 1026-31.
7. McNutt M, Partrick M, Shugars DA, Phillips C, White RP Jr.Impact of symptomatic pericoronitis on health-related quality of life. J Oral Maxillofac Surg. 2008; 66(12):2482-7.
8. McGrath C, Comfort MB, Lo EC, Luo Y. Can third molar surgery improve quality of life? A six month cohort study. J Oral Maxillofac Surg. 2003; 61(7): 759-63; 764-5.
9. Hull DJ, Shugars DA, White RP Jr, Phillips C. Proximity of a lower third molar to the inferior alveolar canal as a predictor of delayed recovery. J Oral Maxillofac Surg. 2006; 64(9): 1371-6.
10. Chuang SK, Perrott DH, Susarla SM, Dodson TB. Risk factors for inflammatory complications following third molar surgery in adults.J Oral Maxillofac Surg. 2008; 66(11): 2213-8.
11. Yildirim G, Ataoðlu H, Mihmanli A, Kiziloðlu D, Avunduk MC Pathologic changes in soft tissues associated with asymptomatic impacted third molars. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2008; 106(1): 14-8.