



The effect of pre and post-operative medications and surgical procedures on the outcome of third molar surgery: a retrospective study

Thesis

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LIST OF ABBREVIATION

AO : Alveolar ostietis

COX : Cyclo-oxygenase

IV : Intravenous

NSAIDs : Non steroidal anti-inflammatory drugs

P : Pain

S : Swelling

T : Trismus

INTRODUCTION

Surgical removal of lower third molar teeth is a common procedure and is associated with potential postoperative complications which include pain, swelling, trismus, and alveolar osteitis⁽¹⁻⁴⁾.

A recent retrospective cohort study by Bui and colleagues⁽⁵⁾ was evaluated the multivariate relationships among risk factors and complications for third molar removal. These efforts were represented a continued movement toward the use of evidence-based medicine to elucidate outcomes to help provide more accurate risk: benefit ratios and allow surgeons to better predict the incidence of complications and identify individuals likely to experience them.

In all surgical procedures, proper preoperative planning and the blending of surgical technique with surgical principles was of paramount importance for decreasing the incidence of complications. Third molar removal is no different, yet such a common procedure sometimes results in what are relatively rare complications.⁽⁵⁾ The possibility of these events should be discussed with patients before the procedure and handled in a timely and corrective manner by the surgeon, complications related to third molar removal were ranged from 4.6% to 30.9%^(5,6), they may occur intraoperatively or develop in the postoperative period.

The most common postoperative complications of third molar extraction were reported in the literature were pain, swelling, infection, trismus, bleeding and localized alveolar osteitis (AO).⁽⁵⁾

Factors thought to influence the incidence of complications after third molar removal were age, gender, medical history, oral contraceptives, presence of pericoronitis, poor oral hygiene, smoking, type of impaction, relationship of third molar to the inferior alveolar nerve, surgical time, surgical technique, surgeon experience, use of perioperative antibiotics, use of topical antiseptics, use of intra-socket medications, and anesthetic technique^(5-7,8-20).

The intent of this article is to provide a literature review and analysis of the various surgical techniques and chemotherapeutic agents used to control, minimize, or eliminate these outcomes of surgical removal of lower third molar. Unfortunately, comparison of the published studies represents a tremendous challenge because of the variability in parameters and methods used for each study. A trend does exist among many of the current researchers, who realize that randomized, controlled, evidence-based research rather than personal experience is necessary to develop appropriate guidelines for using chemotherapeutic agents.

REVIEW OF LITERATURE

Removal of impacted teeth is one of the most common surgical procedures performed by oral and maxillofacial surgeons, and most surgeons cite third molar removal as the operation most likely to humble them. Extensive training, skill, and experience are necessary to perform this procedure with minimal trauma, when the surgeon is untrained and/or inexperienced, the incidence of complications rises significantly.^(6,17,21)

Not all unerupted teeth are impacted, a tooth is considered to be impacted when it has failed to fully erupt into the oral cavity within its expected developmental time period and can no longer reasonably be expected to do so, consequently diagnosing an impaction demands a clear understanding of the usual chronology of eruption, as well the factors that influence eruption potential.⁽²²⁾

It is important to remember that eruption of lower third molars was completed at the average age of 20 years that can be continued up to age 24 years.⁽²²⁾ The chance of eruption of impacted teeth at age 18 years may have as much as a 30 to 50% chance of erupting fully by age 25 years⁽²³⁻²⁵⁾, and substantially the position of impacted third molars did not change after age 25 years.⁽²⁶⁾

A variety of classification systems have been developed to aid in the determination of difficulty. The three most widely used

are angulation of the impacted tooth, the relationship of the impacted tooth to the anterior border of the ramus and the second molar, and the third system is the depth of the impaction and the type of tissue overlying the impacted tooth.⁽²²⁾

Another important determinant of difficulty of extraction was the age of the patient, when impacted teeth were removed before age 20 years, the surgery is almost always less difficult to perform.⁽²²⁾

There was another classification of impacted tooth according to the overlying tissues which was fully bony or partially bony or soft tissue impaction, the full bony impactions are always more difficult to remove than are soft tissue impactions.⁽²²⁾

As a general rule, a more challenging and time consuming surgical procedure results in a more troublesome and prolonged postoperative recovery, it was more difficult to perform surgery in the older individual, and it was harder for these patients to recover from the surgical procedure.⁽²²⁾

Surgical removal of impacted third molars was associated with a moderate incidence of complications, around 10%^(9,27), these complications ranged from the expected and predictable outcomes, such as swelling, pain, stiffness, and mild bleeding, to

more severe and permanent complications, such as inferior alveolar nerve anesthesia and fracture of the mandible.⁽²²⁾

The overall incidence of complications and the severity of these complications were associated most directly with the depth of impaction, and to the age of the patient.^(11,18,28)

Another determinant of the incidence of complications of third molar surgery was the relative experience and training of the surgeon, the less experienced surgeon would have a significantly higher incidence of complications than the trained experienced surgeon.⁽⁶⁾

After the surgical removal of an impacted third molar, certain normal physiologic responses occur, these were included such things as mild bleeding, swelling, stiffness, infection and pain. All of these were interpreted by the patient as being unpleasant and should therefore be minimized as much as possible.⁽²²⁾

Pain

The postsurgical pain begins when the effects of the local anesthesia subside and reaches its maximum intensity during the first 12 hours postoperatively⁽²⁹⁾, and women were more sensitive to postoperative pain than men.⁽³⁰⁾

A large variety of analgesics were available for management of postsurgical pain, the most common were

combinations of acetylsalicylic acid or acetaminophen with codeine and its congeners, and the nonsteroidal anti-inflammatory analgesics.⁽²²⁾

The administration of non-steroidal analgesics before surgery might be beneficial in aiding in the control of postoperative pain, the most important determinant factor of the postoperative pain is the time length of the operation.⁽⁴⁾ Neither swelling nor trismus correlate with the length of time of the surgery, there was however, a strong correlation between postoperative pain and trismus, indicating that pain might be one of the principal reasons for the limitation of opening after the removal of impacted third molars.⁽³¹⁾

Swelling

Some dentists considered edema a complication rather than a normal physiologic reaction to insult and injury, when body tissues were injured, regardless of the cause, the normal physiologic response was inflammation that led to edema. Edema, in varying amounts, would occur after every surgical intervention and should be expected.⁽³²⁾

Prostaglandins also might play a minor role in edema formation but did not appear to be the sole factor involved.⁽³³⁾ Edema occurred as osmotic pressures rise, capillary permeability were altered, transudation of fluid occurred through vessels into

the area of damage, and the local lymphatic system became obstructed by fibrin and fibrinogen clots derived from plasma and adjacent injured tissues. Fluid then accumulated in the interstitial spaces, in most cases greater degrees of tissue injury led to greater amounts of edema.⁽³³⁻³⁵⁾

Hupp⁽³⁵⁾ also noted that edema was variable from area to area and would accumulate more freely in areas of loose connective tissues, whereas tissues that were tightly bounded down to underlying structures tend to have less swelling.

Post-surgical facial edema was difficult to quantify accurately because it involves 3 dimensions of measurement with an irregular, convex surface and can manifest itself internally as well as externally. To the subjective observer, lean patients appear to develop more swelling than patients who are “portly,” “plump,” “stout,” or obese. Messer and Keller⁽³⁶⁾ also stated that redheaded, blonde, and fair-skinned patients swell more than dark-complexioned patients.

Over the years, numerous researchers had tried various measurement techniques in an effort to measure edema and make comparisons between patients. Most were of the indirect assessments of the altered contours of the skin surface, measurement tools mentioned in the literature have included visual analog scales, trismus recordings (which are not generally