Removal of Third Molars

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❖ History

During the first half of the 20th century, the removal of impacted third molars was a formidable surgical procedure. Practitioners were knowledgeable about the pathology, such as infections, cysts, and tumors, that could develop from impacted teeth. However, because of the difficulty and adverse side effects associated with their removal, surgery was often delayed until symptoms began to develop.

During the second half of the twentieth century, a revolution began to develop as a result of the improved technology for the removal of impacted third molars. In particular, the development of high-speed rotary cutting instruments, improved surgical techniques, panoramic radiography, and improved local anesthesia, outpatient general anesthesia, and intravenous sedation combined to significantly improve and simplify the removal of impacted third molars. What had previously been a dreaded surgical procedure, sometimes requiring hospitalization, became a routine, safe office procedure with generally predictable outcomes and a relatively low cost.

Flick WG: The Third Molar Controversy: Framing the Controversy as a Public Health Policy Issue. J Oral Maxillafac Surg 57:438-444, 1999. As a result, it has become an universally accepted practice to remove impacted third molars not only after causing problem but prior to developing any signs or symptoms. As the medical technology has become more efficacious, so has the prophylactic removal of third molars.

The health care resources being devoted to the removal of third molars are in the billions of dollars. American Dental Survey of Services estimated that in excess of 10 million impacted third molars were removed in 1990. Five years later it was estimated that over $2 billion was spent on the removal of impacted third molars in the United States. This figure does not include additional costs for examinations, radiographs, medication, anesthesia charges, hospital/surgical center
charges, or time lost from work. Including these date would make this $2 billion figure even higher.

There is an attempt at limiting these expenditures by third-party payers. These attempts have focused on the prophylactic removal of asymptomatic third molars. Some sources label the procedure as unnecessary surgery. As we usher into the new century and increased competition for scarce resources, it is necessary to reevaluate all medical treatments and procedures, including the removal of impacted third molars.

**Introduction**

A consensus development conference on Removal of Third Molars was held at the National Institutes of Health on November 28-30, 1979. More than 200 practicing dentists and scientists, representing all disciplines within the profession, met in an effort to reach general agreement on when and under what circumstances third molar extraction is advised and to identify areas where further research is needed. The conference was sponsored by the National Institute of Dental Research, National Institutes of Health. The NIH consensus development program brings together biomedical researchers, practicing dentists and physicians, consumers, and others, as appropriate, in an effort to arrive at general agreement on the efficacy and safety of medical and dental technologies and procedures. The conference participants divided into five workshops to explore the following issues:

- the effect of third molar removal on growth and development;
- the timing and technical considerations for third molar removal;
- prosthodontic and periodontic considerations for third molar removal;
- the morbidity of third molar removal; and
- the advantages and disadvantages of third molar removal.

The workshop reports were presented and discussed by all participants on the final day and formed the basis for areas of consensus. A number of articles were published after the NIH conference. In 1993, the American Association of Oral and Maxillofacial Surgeons (AAOMS) sponsored a workshop that included prominent clinicians and researchers.

The Effect of Third Molar Removal on Growth and Development

Although there are cogent orthodontic reasons for early removal of third molars, the group felt that the suggested practice of enucleation of third molar buds, based on predictive studies at age 7 to 9, is not currently acceptable. The workshop concluded that, based on current research with longitudinal records, present predictive techniques for third molar eruption or impaction are not highly reliable, are overly simplistic, and should be used with caution. Another important decision of the workshop participants was that, in some patients, unerupted third molars should be removed before starting maxillary retraction.
procedures which would result in their impaction. Finally, it was agreed that there is little rationale, based on present evidence, for the extraction of third molars solely to minimize present or future crowding of lower anterior teeth, either in orthodontic or nonorthodontic patients.

The Timing and Technical Considerations for Third Molar Removal

There was agreement that postoperative pain, swelling, infection and other possible consequences of surgery are minimized in patients who are dentally young, as judged by the third molar roots being about two-thirds developed. An additional consideration relates to some evidence which suggests that early removal of the third molar has a beneficial effect on the periodontal health of the second molar. The workshop agreed that it is necessary to instruct the student and practitioner in recognizing the need for early removal of third molars in those instances where extraction is definitely indicated. In assessing surgical risk and morbidity related to technique the workshop concluded that age itself is not a risk factor in patients judged healthy by the American Society of Anesthesiology classification system. The incidence of systemic disease increases with age, however, and post-surgical morbidity, both local and systemic, are age-related. Morbidity is minimized by careful surgical techniques, but clinical trials of variations in surgical protocols have not been done and should be initiated. The NIH workshop also identified several other areas of insufficient knowledge related to management of third molars and suggested that they should also be subjects of research. Some of these are: the relation of third molars to crowding of the dentition; the psychological effect of third molar surgery at various ages; the relative cost to the patient of early versus late third molar removal, including monetary investment and personal discomfort; and the effectiveness of adjunctive therapy such as steroids and antibiotics in reducing the morbidity of third molar surgery. A final subject addressed by this workshop was the economic implications of third molar retention versus prophylactic removal at an early age. The group recognized the need to consider the cost to the patient and society of third molar surgery.

However, the topic of cost could not be studied extensively within the context of this conference and it was suggested that it should be carefully analyzed in a separate, carefully planned study. There seems to be relative agreement in the literature on the major therapeutic indications for removal of impacted teeth. The gray area remains the concept of prophylactic (elective) removal of impacted third molars. Neither the NIH Consensus Conference nor the AAOMS has offered guidelines in this area. It is apparent that thousands of third molars are removed each day, and the health care resources being devoted to these services are significant. However, a review of the literature does not consistently reflect what portion of third molars are being removed became of associated pathology or symptoms, and what portion of the third molars are being removed for so-called prophylactic reasons.
this time, it is probably safe to say insufficient data is available to offer an accurate calculation of the number of "prophylactic" extractions.

Prosthodontic and Periodontic Considerations for Third Molar Removal

The NIH workshop recommended that fully-impacted third molars should be removed when there is evidence of pathological changes, as should partially impacted ones when there is evidence of irreversible pathology. Erupted third molars, which can be maintained in a state of health, should be retained for their potential usefulness as abutment teeth and for maintaining vertical dimension. The workshop also identified as an area for investigation the relative risk and/or benefit of retaining or delaying removal of impacted third molars for future prosthodontic use. The NIH workshop further recommended that both short- and long-term studies be undertaken in a number of areas related to periodontal considerations. Some of them are: variations of flap design and bone removal in third molar surgery and their effect upon the periodontal status of the adjacent second molar; the periodontal state of the second molar in situations of long-term third molar presence; the incidence of second molar root resorption due to an adjacent third molar; and the susceptibility of an erupted third molar to periodontal disease in comparison to other teeth.

The Morbidity of Third Molar Removal

The workshop recommended that patients should be informed of potential surgical risks, including any permanent condition that has an incidence greater than 0.5% or any transitory condition that occurs with an incidence of 5% or more. On this basis, available data indicate that for routine cases, patients should be informed about hemorrhage, pain, swelling, alveolar osteitis, trismus, and nerve injury. With unusual cases, other detailed statements should be made to the patient regarding morbidity. There was also consensus that, where indicated, third molars should be removed in the younger aged patient because there is less transitory or permanent morbidity. After lengthy discussion, it was also agreed that impaction or malposition of a third molar is an abnormal state and may justify its removal. Such treatment is not considered "prophylactic." Finally, the workshop advised that further research be undertaken to study, prospectively, the incidence of preoperative, intraoperative, and postoperative morbidity in third molar surgery and its relationship to age. Other suggested research areas involve therapeutic approaches to the prevention or control of pain, swelling, trismus, infection, and hemorrhage.

The Advantages and Disadvantages of Third Molar Removal

This workshop concluded that third molars, whether impacted or erupted, with evidence of follicular enlargement should be removed and
the associated soft tissue should be submitted for microscopic examination. Impacted teeth that develop soft tissue inflammatory conditions (pericoronitis) should also be removed because of their known potential for repetitive infection and morbidity. The workshop recognized, however, that the incidence and recurrence rate of pericoronitis has not been studied and is deserving of prospective investigation. Although there was no consensus on the subject of removal of asymptomatic impacted teeth with no evidence of pathology, it was agreed that long-range studies of the subject are needed. Consensus was reached that third molars with nonrestorable carious lesions and third molars contributing to resorption of adjacent teeth should be removed. Finally, there was some concern about the inadequacy of intra-oral radiographs, particularly bite-wings, in assessing third molars. It was decided that the absence of a third molar on a routine dental film, without a history of prior extraction, demands more extensive radiographic examination.

Nonintervention Outcome Studies

What are the risks associated with nonintervention? This area has been poorly studied because it is inherently difficult to follow a statistically significant cohort for the years required to complete a good prospective study. Van der Linden et al examined 2,872 third molars retrospectively on panoramic radiographs in a dental school. Seven pathologic changes were cross-tabulated by jaw and by association with impacted and nonimpacted teeth. The most frequently seen condition was caries, in impacted teeth but 42.7% in adjacent teeth. No odontogenic neoplasms were seen. Other pathologic conditions noted were decreased alveolar bone height (4.9%), coronal radiolucency (4.6%), and periapical radiolucency (2.3%). Stanley et al reported on a retrospective cross-sectional study of 1,756 patients with 3,702 impacted teeth examined by screening panoramic radiographs from a VA hospital and dental school. Findings included 1.65% with cysts, 0.85% with internal resorption, 4.72% with periodontal bone loss, and 4.78% with resorption on distal of second molar. The total pathology associated with neglected third molars was 12%.

The conclusion of the investigators was that the pathology associated with retained third molars is low.

Summary

The conference participants carefully examined the long-established practice of third molar removal. A number of clinical procedures were endorsed; others were controversial but identified as subjects for additional research. A number of well-defined criteria for the removal of third molars emerged. They are, in part, infection, nonrestorable carious lesions, cysts, tumors, and destruction of adjacent teeth and bone. There is less morbidity associated with removal of these teeth in the young than in the older patient. The effectiveness of removal of third
molars to prevent crowding of lower incisors is not borne out by the studies currently available. Third molar bud removal in youngsters, based on predictive studies, is not currently an acceptable practice in view of available knowledge. Clinical experience suggests that morbidity and serious complications may be reduced if impacted teeth are removed at an early age. The observation is not disputed by available data, but there is enough question about the life-cycle of impacted third molars to suggest the need for well-designed prospective studies of the subject.

Many health care purchasers and third-party payers have become concerned about the escalating costs of health care. This has prompted a reassessment of the appropriateness of third molar surgery. The appropriateness of a health service considers whether the procedure makes a difference and whether the treatment should be available to everyone or only certain subgroups of the population. Available literature has not really challenged the therapeutic effectiveness of third molar removal. Rather, attention has been focused on the appropriateness of the preventive removal of impacted third teeth that are not associated with any pathology. This procedure has been inaccurately labeled as the prophylactic removal of asymptomatic third molars. Critics have identified this procedure as inappropriate and unnecessary. From a clinical perspective, use of the term asymptomatic is incorrect when it is used to imply the absence of pathologic condition, because most pathologic conditions that develop in association with impacted third molars are initially asymptomatic. Problems such as cysts, caries, and periodontal disease create clinical symptoms only after significant damage has been done to the adjacent tissues. Using the term asymptomatic to denote the absence of pathologic conditions, as has been implied in several articles, only confuses the issue. Using this term is convenient because it is easy to understand, but symptoms may be absent in the presence of a frank pathologic condition. Therefore, it is important to realize that the discussion is not about the extraction of asymptomatic third molars, but rather about the removal of impacted third molars without an associated pathologic condition. The second problem in this controversy is the correct framing of the issues in broader public health terminology. As an example, in an attempt to control health care costs, some third-party payers are now labeling prophylactic extractions as unnecessary. Many third-party payers are already using some of the articles cited in this report as grounds for denying benefits to patients.

❖ Another Opinion

The Third Molar Controversy: Framing the Controversy as a Public Health Policy Issue

by Robert T. Lindner, DDS, Private Practice, Greensburg, Pennsylvania
The subject of removing the asymptomatic third molar is a controversy that has as many opinions as there are practitioners or insurance companies. As has been suggested, insurance companies are paying out large sums of money for third molar surgery. This has prompted a discussion on whether this procedure is necessary for the well-being of the patients who are entrusted to our care. Various health care plans have shown that insurance carriers want strict guidelines established for third molar removal. We have had instances where the insurance company will only pay for symptomatic third molar surgery and when the patient presents with a pericoronal infection, the claim is rejected. The reason given is that pericoronitis is not a symptom, but part of the normal eruption process. The problem for both insurance companies and practitioners is that there are not only no true scientifically based studies that show proof in justifying our removing third molars, but also the timing, predisposition to complications, or the likelihood of these teeth remaining asymptomatic. The AAOMS Board of Trustees realized that past studies and experiences were not enough to justify the idea that removal of third molars is important to the overall health care of the patient in the minds of the insurance companies and in some cases, the practicing oral and maxillofacial surgeons.

A study underway will prove once and for all that we are preventing a great health risk, reducing postoperative complications, and protecting the overall dental and physical well-being of our patients when we promote the philosophy that, in general, removal of third molars is a necessary procedure.


References


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