

Coronectomy is an effective strategy for treating impacted third molars in close proximity to the inferior alveolar nerve

A critical summary of Long H, Zhou Y, Liao L, Pyakurel U, Wang Y, Lai W. Coronectomy vs. total removal for third molar extraction: a systematic review. *J Dent Res* 2012;91(7):659-665.

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Systematic review conclusion. Coronectomy of an impacted mandibular third molar with a high risk of experiencing nerve injury is less likely to cause damage to the inferior alveolar nerve than is complete extraction of the third molar.

Critical summary assessment. Evidence suggests that coronectomy is a good option for patients at risk of experiencing inferior alveolar nerve injury but is technique sensitive and not without complications.

Evidence quality rating. Good.

Clinical question. Among patients at high risk of experiencing inferior alveolar nerve injury due to removal of an impacted mandibular third molar, does coronectomy decrease risk of nerve injury or other complications such as infection in comparison with complete removal of the tooth?

Review methods. The authors independently and in duplicate searched five databases for the period from 1990 through 2011, without language restriction and including gray literature, for studies of coronectomy of mandibular third molars versus complete removal of the tooth. The primary outcome of interest was inferior alveolar nerve injury, defined as paresthesia, dysesthesia, analgesia and anesthesia; secondary outcomes included osteitis (dry socket), infection and postoperative

pain. The authors included in their systematic review only studies involving defined high risk of nerve injury as measured by means of radiography. The authors identified 38 studies with their search strategies; however, only four met all inclusion criteria. Of the four studies included in the meta-analysis, two were randomized controlled clinical trials and two were controlled clinical trials. The authors pooled studies by using Review Manager 5 (Cochrane Information Management System, Copenhagen, Denmark) and calculated risk ratios (RRs) with corresponding 95 percent confidence intervals (CIs). They conducted standard tests for heterogeneity and publication bias. In addition, they completed a sensitivity analysis of the influence of different statistical assumptions and their effect on risk estimates.

Main results. Frequency of nerve injury among those undergoing complete removal of the impacted third molar varied among the four studies; however, results from all studies demonstrated a strongly protective benefit for those undergoing coronectomy. For example, pooled results from the four studies demonstrated only two nerve injuries for the coronectomy group (total of 401 mandibular third molars) as compared with 42 reported events for the complete-removal group (total of 539 mandibular third molars). Thus, risk of nerve injury was significantly reduced for patients who underwent coronectomy as compared with complete removal of tooth structure (RR, 0.11; 95 percent CI, 0.03-0.36). There was little difference between the two treatment groups in regard to postoperative infection (RR, 1.03; 95 percent CI, 0.54-1.98) and osteitis (RR, 0.55; 95 percent CI, 0.28-1.05). Moreover, coronectomy may reduce postoperative pain among patients without antibiotic coverage as compared with that among patients who underwent complete removal of third molars (RR, 0.79; 95 percent CI, 0.64-0.98). Frequency of failed

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coronectomy varied between 38 percent in one randomized controlled clinical trial and 10 percent or less in the other three studies.

Conclusions. Coronectomy is an effective strategy for minimizing inferior alveolar nerve injury in patients at high risk of experi-

encing nerve injury.

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COMMENTARY

Importance and context. Researchers have reported that the most frequent complaints among patients with symptomatic third molars are pain, swelling, food impaction and purulent discharge.¹ Impacted mandibular third molars also have been shown to adversely affect the periodontium of the adjacent second molar as reflected in disruption of the periodontal ligament, root resorption and increased pocket depth associated with loss of attachment.² It is reasonable to think, therefore, that many patients will benefit from extraction of third molars because of periodontal disease, pain or other sources of disease sometime during their lifetime. Because of anatomy, some patients may have mandibular third-molar root development that compromises the inferior alveolar nerve and puts it at risk of experiencing injury during complete removal of the tooth. Strategies for patients who require extraction of their symptomatic mandibular third molars that minimize risk of injury to the inferior alveolar nerve are needed and important.

Strengths and weaknesses of the systematic review. A strength of this review was its completeness of reporting. The authors defined specific search criteria for inclusion and exclusion of studies, and they included gray literature in their search. The authors used appropriate statistical methods, including a sensitivity analysis. Limitations of the review include that the best surgical technique for coronectomy has not been determined owing to its relatively recent introduction into the canon of oral and maxillofacial surgery. Thus, there are some inconsistencies throughout the studies in regard to the technique of coronectomy and its associated complications. In addition, the specificity and sensitivity of radiography in identifying mandibular third molars associated with the inferior alveolar nerve are evolving.

Strengths and weaknesses of the evidence. The strength of the evidence is quite robust. This study included 699 patients with 940 impacted mandibular third molars. Patients who were determined by means of radiography to be at high risk of experiencing inferior alveolar nerve injury and who underwent coronectomy were 90 percent less likely to have an injury of the inferior alveolar nerve than were patients who underwent complete removal of the tooth. There was no increase in risk of osteitis or infection in either group. However, complications such as root migration and the need for repeat surgery were reported in the coronectomy group.

Implications for dental practice. Coronectomy should be considered as an alternative for patients who require removal of symptomatic mandibular third molars and who have an increased risk of experiencing inferior alveolar nerve injury as assessed by means of radiography. However, because of potential complications of the technique and inconsistencies in radiographic interpretation, a qualified surgeon should perform the procedure. ■

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For more information on the evidence quality rating provided above and additional critical summaries, please visit <http://ebd.ada.org>.

1. Punwutikorn J, Waikakul A, Ochareon P. Symptoms of unerupted mandibular third molars. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1999;87(3):305-310.
2. American Association of Oral and Maxillofacial Surgeons Task Force. White Paper on Third Molar Data. 2007. www.aaoms.org/docs/third_molar_white_paper.pdf. Accessed Aug. 14, 2013.