

Coronectomy

Partial Odontectomy or Intentional Root Retention



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KEYWORDS

- Coronectomy • Intentional root retention • Partial odontectomy • Third molars • Wisdom teeth
- Inferior alveolar nerve

KEY POINTS

- Coronectomy protects the inferior alveolar nerve from damage when lower third molars need removing.
- Cone-beam computed tomography (CBCT) has become the standard of care in deciding whether to offer coronectomy to a patient where there is a close relationship between the tooth and the nerve.
- There are reported variations in technique, but they do not seem to affect the results.
- Root migration seems to be the most frequent complication.

My personal interest in coronectomy started when I heard Brian O’Riordan (a London-based oral and maxillofacial surgeon) give his retirement talk to the annual meeting of the British Association of Oral and Maxillofacial Surgeons in Buxton, England in 1997. The title of his talk was “Uneasy Lies the Head that Wears a Crown.”¹ In this he presented a fascinating story of his 30-year love affair with coronectomies and showed much of the rationale and also his long-term results. I returned to California energized and determined to try this technique. At that time, it was not widely practiced in the United States and nobody was lecturing or publishing on the topic. As we began to develop the technique and look at our early results (our first publication was in 2004),² the technique began to gain some popularity locally and nationally, and although it still remains controversial in the United States, it did assume a degree of respectability when the American

Dental Association approved a procedure code (D7251) for coronectomy, effective January 2011. However, just because the American Dental Association recognized the technique and gave it a code number does not make it universally accepted and even more does not ensure that dental insurance companies will reimburse for the technique, and even now several of them do not reimburse for this technique. Nevertheless, the technique does seem to be gaining wider acceptance, although there are some differences in the indications and actual technique used within and between countries.

In this article I discuss these differences in the light of personal experience. The degree of acceptance of the technique in some ways can be judged on the number of articles in peer-reviewed journals on the topic. From 1965 to 2004, there were only seven articles on coronectomy in the English language literature over a 38-year period,^{1,3–8} and all

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of these were after 1988. Since then, the numbers each year are as follows:

2004	3
2005	3
2006	2
2007	1
2008	1
2009	5
2010	5
2011	6
2012	8
2013	11
2014	6

CONTROVERSIAL ISSUES CONCERNING CORONECTOMY

Most authorities agree that the technique is indicated when there is high probability of damage to the inferior alveolar nerve if the whole tooth is removed. Previously evaluations were made on Panorex radiographs using several criteria including overlapping of the nerve shadow on the roots of the teeth, narrowing of the nerve shadow, or deviation of the nerve shadow.^{9–12}

Although medical-grade (also called fan beam or multislice) computed tomography (CT) scanning has been available since the mid-1970s to determine the relationship in three dimensions, it was not widely used because it was relatively expensive, the radiation dosage was comparatively high, the availability was limited, insurance would not reimburse for it, and the software did not allow easy visualization of the relationship between the inferior alveolar nerve and the roots of the third molar. The increasing availability of cone-beam CT (CBCT) scanning from 2002 onward eased these problems in that the radiation dose is much lower than with fan-beam CT, the cost is much lower (around \$300 in the United States), and the software makes easy visualization of the relationship between the inferior alveolar nerve and the tooth in three dimensions. CBCT scanning is now the preferred imaging technique to determine in three dimensions what appears to be a close relationship between the inferior alveolar nerve and the third molar roots.^{13–19}

Classifications of the relationship of the nerve to the tooth vary on CBCT, but in general there are three groups, based on the risk of permanent inferior alveolar nerve damage following removal of the whole tooth.

1. Low risk: This occurs when the panoramic radiographic appearance turns out on the CBCT scan to be superimposition only. There is separation of the nerve and the root with a covering of bone in between (**Fig. 1**).
2. Medium risk: This occurs when the nerve is directly adjacent to the roots of the tooth or is mildly grooving the root of the tooth (**Fig. 2**).
3. High risk: This occurs when there is deep grooving of the tooth by the nerve or even perforation of the tooth root by the nerve with the roots growing around the nerve (**Fig. 3**).

We prefer not to use numbers, or percentages, because patients often want to apply overall numbers to their own personal situation.

It is important to realize the differences in image acquisition with fan-beam (medical grade) CT and CBCT scanning. In principle, fan-beam or medical-grade CT uses slices that are now usually less than 1 mm apart, to build up a composite image. In contrast, CBCT scanning uses volumetric image acquisition and visualization. Because of this, the resolution of CBCT scanning cannot match that of fan-beam CT scanning and so it is not always possible to visualize the exact relationship at some

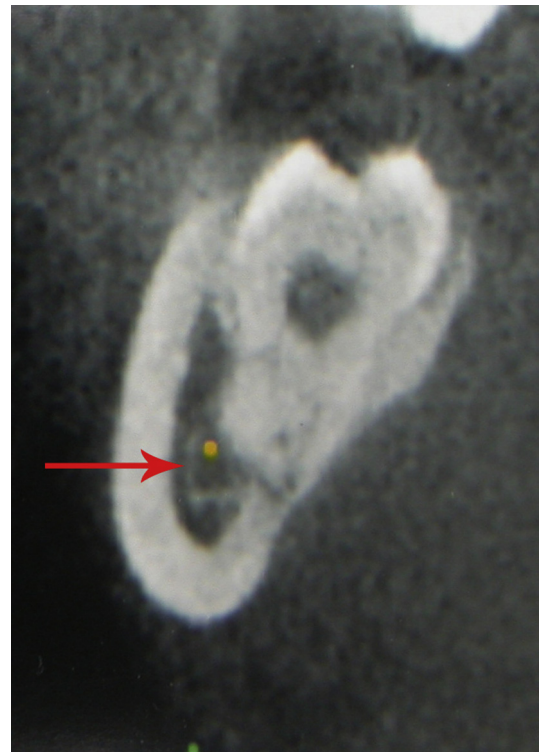


Fig. 1. A coronal slice from a cone-beam CT scan showing the inferior alveolar nerve (*arrow*) as separate from the root of the tooth. This represents a low risk of permanent nerve involvement following removal of the tooth.

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