Coronectomy

BACKGROUND

Coronectomy involves the removal of a tooth's dental crown while leaving the roots in situ and is commonly done for lower third molars, or wisdom teeth. The primary goal is to reduce the risk of damaging the inferior alveolar nerve (IAN) when the tooth has roots in close proximity to that nerve. The evaluation of patients and management concerns associated with coronectomy were discussed.

EVALUATION

Clinical Assessment and Imaging

Wisdom teeth that are asymptomatic and causing no damage to surrounding structures can be left in place. Those that are symptomatic or creating problems for adjacent teeth may be candidates for removal, but each case will require a complete patient history as well as clinical and radiographic evaluation before any plan of care is formulated. Among the factors to be considered are the patient's medical history, any apical pathologic conditions, mobility of the tooth, proximity of the roots to the IAN, and root anatomy.

If lower third molar roots are close to the IAN, they can appear narrowed, curved, overlapping, darkened, or have apical radiolucencies. Such teeth would be considered to be at high risk for complications.

Generally a plain film is obtained to evaluate the need for a coronectomy. The radiographic signs that coronectomy may be indicated include the deviation of 'tram lines,' or an interruption of the white lines that represent the inferior dental (ID) canal; darkened roots; deflection or sudden narrowing of the lower third molar roots; narrowing of 1 or both white lines of the ID canal; periapical radiolucency of lower third molars; curved roots; loss of the ID canal cortex exceeding 3 mm; and loss or interruption of the lamina dura of the third molar. Some evidence indicates that canal diversion, darkened root, and interruption of the white line of the ID canal are actually the only factors significantly related to IAN damage.

Use of cone beam computed tomography (CBCT) will produce high-quality images of the tooth in all fields of view and enable the clinician to evaluate the tooth more completely than can be done using a plain film. However, the use of CBCT images does not influence the sensitivity or specificity related to predicting nerve damage during coronectomy, although these images can help in surgical planning and reducing risks.

Findings on the CBCT examination indicative of a high-risk tooth are as follows (Figure 2):

- Perforation of the tooth root by the ID canal ('polo mint' appearance)
- Narrowing of the ID canal
- Direct contact or flattening of the nerve by the molar root
- Decortication of the bone
- A lingual course of the nerve with or without perforation of the cortical plate
- Intraposition of the nerve

Clinicians are advised to follow the SEDENTEXT Guidelines when evaluating the CBCT images. Although CBCT images can enhance surgical planning and clarify the position of the IAN and third molar roots, this modality should not be considered a routine approach for all third molar presurgical evaluations.

Informed Consent Process

Patients should be told about the benefits and potential risks of coronectomy during the informed consent process. In particular, they should be informed about the following:

1. The tooth may require extraction if the roots are mobile (9% to 38% of cases).
2. About 30% of coronectomized roots may migrate and erupt through the gingivae within 6 months to 10 years and require extraction. This secondary procedure should be of lower risk than the initial procedure.
3. Pain related to alveolar osteitis (dry socket) should be less likely with coronectomy than extraction, but the reported incidence is about 5% in both.
4. Coronectomy can produce less pain than extraction, but evidence to support this is still needed.
5. Coronectomy can fail because of operator error or enamel lipping. All enamel should be removed to avoid the risk of infection.

MANAGEMENT CONCERNS

General dentists can attempt to obtain a periapical radiograph of the lower third molar area, but often the patient cannot tolerate the positioning of the film holder posteriorly, so an orthopantogram (OPG) may be required. The OPG should be of excellent quality so that it can be transmitted digitally to an oral surgery specialist if doubt about the correct course of action remains. This avoids exposing the patient to an additional dose of radiation.

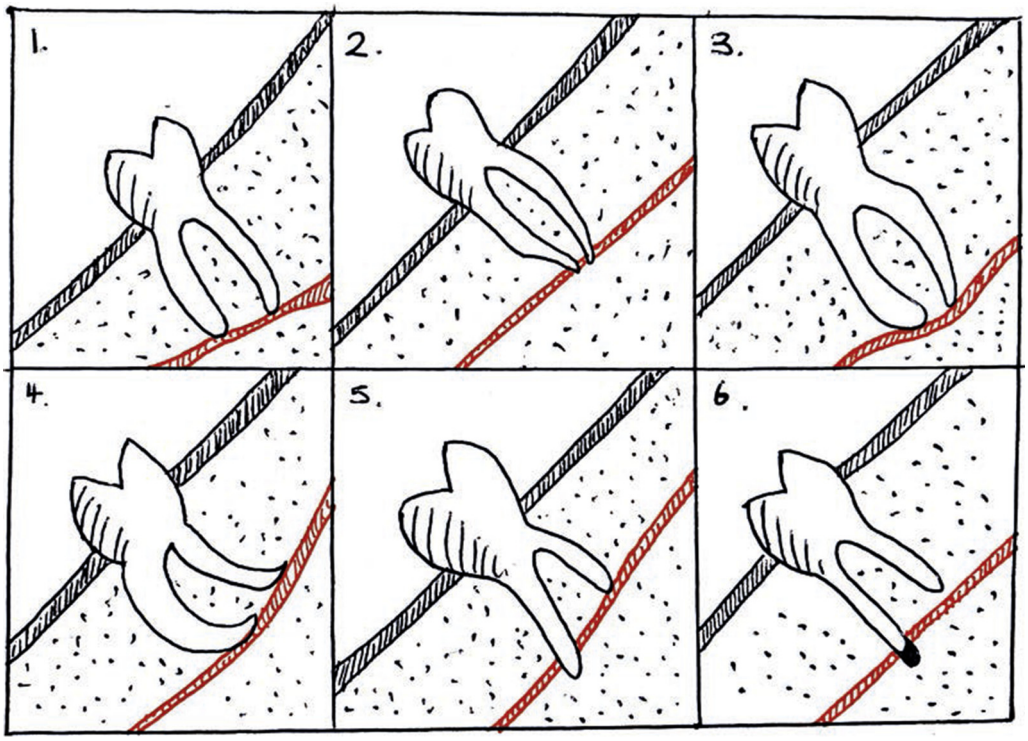

Figure 2. Diagrammatic representation of the roots of 'high risk' molars and relationships to the inferior alveolar nerve: *1,* Narrowing of the ID canal; *2,* narrowing of the roots; *3,* deviation of the ID canal; *4,* curving of the roots; *5,* overlap of roots; *6,* darkening/periapical area of the roots. (Courtesy of Bhola S, Pellatt: Coronectomies: Assessment and treatment planning. *Br Dent J* 225:125-128, 2018.)

Patients who have undergone coronectomy or have postoperative sequelae such as dry socket or inflammation can be managed conservatively by the dentist even if the coronectomy was performed by a specialist. If the dentist notices migration of the root through the gingiva, a second procedure will be needed.

Adjunctive Procedures

Some evidence indicates that bone grafting can improve coronectomy outcome. It's possible that guided bone regeneration may also help to reduce the risk of root exposure after coronectomy.

DISCUSSION

Coronectomy offers an option other than extraction for teeth that don't require roots to be removed. Often done for lower third molars to avoid injuring the IAN, this procedure still involves risks and requires the careful consideration of a number of factors before proceeding.

Clinical Significance

The general dentist often sees patients whose lower third molars are causing them discomfort. The initial evaluation of these patients may indicate that coronectomy would be appropriate instead of extraction. This outline of the indications for coronectomy and management concerns for a general dentist provides useful information that can lead to appropriate decisions for treatment of these cases.

Bhola S, Pellatt: Coronectomies: Assessment and treatment planning. *Br Dent J* 225:125-128, 2018

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