CORONECTOMY OF MANDIBULAR WISDOM TEETH: A CASE SERIES AND BRIEF REVIEW OF LITERATURE

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Abstract

Purpose: This study aims to collect data related to radiographic assessment, surgical procedures, and postoperative complications following coronectomy.

Methods: A literature reviews related to coronectomy of mandibular wisdom teeth was done. Moreover, the present case series reports five patients underwent coronectomy with follow-up examinations at one week, 1 month, 3 months, and 6 months. All roots were left at least 3 mm below the buccal and lingual plates of bone. Radiographic examination was done for all patients preoperatively to identify the intimate relationship between the root and inferior alveolar nerve canal.

Results: Among the five cases of coronectomy, there were no evidence of inferior alveolar nerve damage in this study.

Conclusion: Within the limitations of the present study, it can be concluded that coronectomy is a safe technique to avoid IAN injury where there is an intimate relationship between inferior alveolar nerve canal.

Key words: Coronectomy, Inferior Alveolar Nerve (IAN), Nerve Injury

Introduction

Third molar surgery related inferior alveolar nerve injury (IANI) is reported to occur in up to 3.6% of cases permanently and 8% of cases temporarily (1,2). Age, difficulty of surgery, and proximity to the inferior alveolar nerve canal are the associated factors leading to IAN injury. The radiographs are the mainstay for evaluation when surgical removal of mandibular wisdom teeth is required. Radiographic signs indicative of possible IAN risk include (3,4):

- Diversion of the canal
- Darkening of the root
- Narrowing the root/ canal
- Interruption of the canal lamina dura
- Interruption of the juxta-apical area

If there is any evidence among these radiographic signs, frequently two of the above signs, total removal of the third molar will result in increased risk of IANI up to 2% permanently and 20% temporarily (5,6,7). Coronectomy reduces the possibility of nerve injury by securing retention of the vital roots when the intimate relationship between inferior alveolar canal and roots is estimated on panoramic radiographs or CBCTs. This study aims to collect data related to radiographic assessment, surgical procedures, and postoperative complications following coronectomy.

Literature Review:

1. Radiographic assessment

In order to estimate the risk factor of IAN injury, radiograph is very essential. Risk is up to 1-4% permanent injury and 20% temporary IAN injury of the patients who radiographically present the intimate relationship between root of the teeth and IAN canal (3). Three radiological signs were found to be significantly related to nerve injury: (a) diversion of the inferior alveolar canal (b) darkening of the third molar root at the site of over-projection and (c) an interruption of the white line of the mandibular canal (8). Frafjord & Renton (2010) stated that in the present of one or more radiological signs of warning the prospect of nerve injury must be discussed with the patient and surgery may be postponed until the advent of absolute indication. Moreover, Renton et al. (2005) identified one preventive measure might be coronectomy with intentional root retention. According to the study taken by Blaeser et al (2003) showed that panoramic findings of diversion of the inferior alveolar canal, darkening of the third molar root, and interruption of the cortical with line are statistically associated with IAN injury. In addition, the absence of predictive radiographic signs, the risk of IAN injury is negligible (9).

2. Surgical procedures

Different surgical techniques have used among each surgeon. For instance, Renton and Leung & Cheung sectioned through the crown was partial whereas complete section of the
A crown from the roots was undertaken by Dolanmaz and Pogrel (4,5,6,7). This may explain why there were root mobilisations in in the fully sectioned groups. One considerable point is that complete sectioning of the crown from the root may place the lingual nerve at risk, so Dolanmaz and al. suggested that complete sectioning may not be vital (6). For antibiotic, Renton and Leung & Cheung did not prescribe any antibiotic and recommended only pre- and post-operative chlorhexidine mouth wash.

3. Postoperative complications

Short-term postoperative complications

Postoperative complications in relation to mandibular wisdom tooth removal have been reported to occur in 4.6-30.9% of cases (8). The most commonly reported complications are localised alveolar osteitis, infection, bleeding, and paresthesia (9). Coronectomy reduces the incidence of paresthesia, but rated for the others are similar (10).

Long-term postoperative complications

Root migration and root eruption are the long-term complications. The remnants of root seem to move the most during the first 6 months according to Dolanmaz et al (6). Rarely, continued migration of the root(s) may result in eruption into the oral cavity (10).

Materials and Methods:

Five patients who attended Faculty of Dentistry in Cambodia approved to get coronectomy. Those patients were judged to be included criteria group because they all were high risk of Inferior alveolar nerve injury based on radiographic features in routine preoperative dental radiographs. These features included the morphology of the root and proximity of the mandibular wisdom teeth to the nerve canal. Patients who were more susceptible to the local infection (from diabetes, immune compromise such as HIV, chemotherapy, osteoradiotherapy, and osteosclerosis), and who had systemic infections were excluded.

The anaesthetic injection technique was the same among five patients in which Inferior Dental Block (IDB), Buccal Block, and infiltration with Lidocaine 1:100,000 Adrenaline were injected. One of the five patients got sedation with Triazolem 0.25mg via oral administration for one hour before operation due to apprehension.

Regarding surgical technique, long envelope flap was raised; tooth crown was sectioned by leaving the root and vital pulp in-situ. The socket was then irrigated with saline, and flap was closed with silk suture 3.0. Antibiotic (Amoxicilline 500mg + Clavulanic acid 125mg), analgesic drug (Ibuprofen 400 + Paracetamol 500mg + Codeine 15mg), Dexamethazone 0.5mg and chlorhexidine mouthwash were prescribed. Moreover, all patients had preoperative chlorhexidine mouthwash.

Questionnaires were filled before surgical procedure and at the time of follow-up (Box 1). The follow up examinations were done at one week, one month, three months and 6 months after surgery. All the patients were contacted by having a phone call. Post-operative radiographs were taken at three months and six months after surgery.

Results:

Among the five cases presented, no complication of paresthesia was found. There was not any evidence of numbness on the gingiva, lip, or chin. Root migration has not yet encounter.

Discussion:

The result of this study showed that there was not any complication of paresthesia among the five cases. This study seems to highlight the success of coronectomy. The present results are in line with those reported in the randomized controlled clinical trial of Retnon and colleagues who compared the incidence of injury to the inferior alveolar nerve as a result of coronectomy and removal of mandibular third molars (2). In that study, 128 patients who needed operations on mandibular third molars were randomized to receive either extraction or coronectomy. 102 teeth were extracted, while coronectomy was performed for 94 teeth. Among all cases, no nerve damaged was found in the coronectomy group. However, nerve damage was observed in 19 patients in the extraction group.

Some study did not rely on about coronectomy. Instead of leaving the root with vital pulp in the bone, Metin and colleagues performed a study to assess whether root canal treatment is necessary for coronectomy (11). Ten patients with 16 lower third molars, which were in close relationship with IAN, were divided into two groups. Coronectomy with endodontic treatment was performed for patients in the test group, while in the control group, patients underwent coronectomy without endodontic treatment. The result of that study indicated that infection was observed in the 8 patients in study group that may be due to the prolonged time of flap opening. On the other hand, no infection was occurred in control group.

It is important to mention that the results of the present study should be interrupted with caution since the sample size of the study is small and the follow up period is relatively short. Therefore, future studies with larger sample size and longer follow-up period are necessary to make a clear conclusion on the success and long-term complications of the coronectomy procedure.
A male 30-year-old patient presented problem with lower left partial erupted tooth (#38) and wanted to remove.

A male 21-year-old patient with coronectomy. Coronectomy on lower right wisdom tooth (#48).
A male 30-year-old patient had a coronectomy on lower left partially erupted tooth (#38).
Conclusion

If radiograph examination shows the close intimacy of mandibular molars to the IAN, using safe surgical techniques should be taken into account, proper radiographic assessment should be done, and the patient should be informed about possible postoperative complications. Within the limitations of the present study, it can be concluded that coronectomy is a safe technique to avoid IAN injury where there is an intimate relationship between tooth roots and IAN. Therefore, it is recommended that coronectomy be further studied and practiced among dental students and dentists.

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