Incidence of injury to lingual nerve during surgical removal of lower third molar teeth

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ABSTRACT

Background: The precise anatomic location of the lingual nerve in relation to the lingual cortex of the posterior mandibular third molar is clinically significant because lingual nerve subjected to injury during varieties of oral and maxillofacial surgery especially in the surgical removal of impacted lower third molar.

In this study we find the incidence of injury to lingual nerve as a complication of surgical removal of impacted third molar. Fifty dental patients of 20-25 years old, male and female, 25 cases were done by me and other 25 cases were done by my colleagues in the maxillofacial department in the college of dentistry-university Sulaimani, suffering from impacted lower third molar tooth, subjected to surgical removal of these teeth, we study the incidence of injury to lingual nerve in form tip of the tongue parasthesia for one month postsurgery. The aim of study is that to find the incidence of injury to lingual nerve during surgical removal of fully impacted lower third molar tooth and factors affecting this surgery.

Materials and methods: 84 third molars surgery of mucoperiosteal marginal soft tissue flap of buccal approach were carried out under local anaesthesia by using surgical set for tooth extraction, 4.0 black silk suture to close the wound.

Results: The incidence of injury to the lingual nerve is 2.8% as a temporary sensory disturbance, while no patient 0% of permanent of sensory disturbance.

Conclusion: The incidence of injury to the lingual nerve can be reduced by careful clinical evaluation, proper surgeon’s experience, and wide anatomical knowledgement during surgical removal of impacted lower third molar tooth.

Key words: Lingual nerve. Impacted lower third molar.

INTRODUCTION

The anatomic proximity of the lingual nerve to the mandibular third molar region plays an important role in planning and performing surgical intervention in this area (1). The lingual nerve pass foreword in the submandibular region from infratemporal fossa by running beneath the origin of the superior constructor muscle, which attach to posterior border of mylohiod line on the mandible, here it is closely related to the last molar and is liable to be damage in case of clumsy extraction of an impacted third molar (2). Kisselbad and Chamberlai (3) demonstrate that the lingual may be located at sometime superior to the crest of bony ridge medial to the mandibular third molar region and only 1 or 2 mm toward the midline in the lingual soft tissue. In this location the lingual nerve in rare occasions, will be vulnerable to stress as flap is raised from an impacted third molar and it will in risk during other surgical maneuvers performed during the removal of a mandibular third molar. Mozovy and Middlecton (4) showed may variation of normal anatomy exist including lingual nerve position.

The risk of damaging the lingual nerve during mandibular wisdom tooth surgery differs in the literature. Horch (5) reports an injury incidence of 0.05% and Hoffmeister (6) 0.04% while Appiah-Anane (7) gives an incidence of reversible dysesthesia after mandibular wisdom tooth surgery.

Most studies of lingual nerve damage have shown an incidence ranging from about 1% to 6% during surgical removal of lower third molars (8), although a recent study found an incidence of 11% (9) of injury to lingual nerve.

In spite of the removal impacted third molar is a common procedure, in some case it can be difficult, it is hard to evaluate factors of the long-variation among patients, and difficult of using a study design (10). The surgical removal of third molars may result in a number of complication including pain, swelling, bleeding, alveolar ostieitis, and nerve dysfunction (11). The factors that usually contribute to such problems are numerous and include the patient-tooth related, the surgeon’s operative experiences (12). The first classification system employs a description of the angulations of the long axis of the impacted lower third molar with respect of the long axis of the second molar in form of mesioangular, horizontal, vertical impaction, and distoangular (13); while Pell & Gregory (14).

Classification that depend on the relationship between the impacted tooth and anterior part of the ramus, in the class 111 and class 11 there is
possibility of postoperative lingual nerve dysfunction.

A great deal of research has been undertaken in relation to the incidence of nerve injury during lower third molar surgery, but little is known about the factors affecting the rate of damage. This study dealing with some of these factors as the long surgeon experience, wide anatomical knowlegments about this area, type of surgical flap for removal of impacted lower third molars (surgical factor), and clinical evaluation of a case. All these factors may contribute in the reduction the incidences of the injury to the lingual nerve during third molar surgery, also to determine if the incidence of lingual nerve damage differs to any signified extend from that reported elsewhere.

Figure 1: lingual nerve origin and distribution

PATIENTS AND METHODS
Subject: Fifty out patients male and female, ratio 1: 1.6 the mean age 23 years (range 20-26 years), 68(%) were suffering from bilateral fully impacted wisdom teeth while remaining 32 (%) patients had only one side of fully impacted third molars, that means 84 third molars surgery were carried out, most of them were in maxillofacial department of college of dentistry University of Sulimani, other were carried in my private clinic.

All the procedures were done according to standardized protocol with the patients, under local anaesthesia in form of inferior alveolar nerve block injection and long buccal nerve block injection with buccal infiltration injection.

The fully impacted lower third molar was removed in only one of these procedures. A mucoperiosteal marginal soft tissue flap was used with or without releasing incision, lingual tissues were retracted during bone removal with howarth-periosteal elevator. The flap was reflected, the contiguous bone was removed buccally and sometimes distally according to the cases with a round burr and a fissure burr in a high –speed hand piece was used to section the teeth. Constant irrigation with cold sterile physiological saline solution was used with the burr. The flap was then repositioned and by a 4-0 silk suture was used to close the wound; no lingual flap was employed in any of the cases.

METHOD: All the patients before the operation subjected for clinical examination and the causes for removal of impacted teeth was recorded as in table (1), Type of angulations of teeth was recorded as in table (2). Periapical X-ray view preoperatively assessment for all patients. Postoperatively, those patients who did proceed to lower third molar surgery were reviewed one week after operation when they asked about altered sensation related to lingual nerve sensory disturbance and anatomical distribution of lingual nerve were assessed by testing with a probe or cotton wool. The primary focus of this study was overall nerve damage and not a degree of sensory deficient present, these patients with evidence of sensory disturbance were reviewed every week for one month.

Table 1: Indication for removal of wisdom tooth

<table>
<thead>
<tr>
<th>Indication for removal of wisdom tooth</th>
<th>Number of teeth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymptomatic (prophylactic cause)</td>
<td>31</td>
</tr>
<tr>
<td>Chronic periodontitis</td>
<td>8</td>
</tr>
<tr>
<td>Crowding of anterior teeth (orthodontic cause)</td>
<td>45</td>
</tr>
</tbody>
</table>

Table 2: Types of angulation of impacted tooth

<table>
<thead>
<tr>
<th>Types of angulation of impacted tooth</th>
<th>Number of impacted tooth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distoangular impaction</td>
<td>7</td>
</tr>
<tr>
<td>Horizontal impaction</td>
<td>6</td>
</tr>
<tr>
<td>Mesioangular impaction</td>
<td>40</td>
</tr>
<tr>
<td>Vertical impaction</td>
<td>31</td>
</tr>
</tbody>
</table>
RESULTS

Eighty four lower third molar surgery for 50 patients male & female mean age 23 years. All the patients treated under local anaesthesia. The surgical procedures were performed on buccal approach avoiding lingual split technique. The finding 2 patients 2.8% have temporary sensory disturbance in form of parasthesia of side of the tongue as incidence of injury to lingual nerve. While no patient 0% of permanent of sensory disturbance.

While the incidences of injury to lingual nerve in form of permanent disturbance no case was recorded 0%.

These 2 patients belong to group of horizontal angulations impaction, the incidence of injury to lingual nerve in this type of impaction of lower third molar is 28%.

Other finding in this study

- Sectioning of crown of impacted tooth 53 teeth 63%
- Bone removal from buccal and buccodistally 76 teeth 90%
- Soft tissue reflection but no need for bone removal 8 teeth 9.6%

DISCUSSION

Previous studies have shown the incidence of damage to the lingual nerve following mandibular third molar surgery varied from 0% (19) to 23% (20). The incidence of temporary nerve parasthesia and permanent nerve dysfunction in our study are in keeping with these studies. The incidence of permanent damage of lingual nerve during third molar surgery were to be found lower than the incidence reported by Bataineh (21). The result of this study is quiet consistent with the result of Sisk et al. (22), but the finding of this study is not consistent with Horch (5) who reported an incidence of injury of lingual nerve 0.5%, HOFFMEISTER (6) 0.04% in the primary disturbance of lingual nerve but the study consistent with the result of permanent disorder of lingual nerve injury. Also the finding of this study is fewer incidences than that finding by APPIAH-ANAAE (7) who give 11.5% as incidence of reversible dysesthesia after mandibular tooth surgery. Similar to result of this study was reported by Blackburn (23) who stated that "most studies of lingual nerve damage have shown an incidence ranging from about 1 to 6 per cent during surgical removal of lower third molars, although a recent study found an incidence of 11 per cent (9). Root (24) estimated the incidence of permanent lingual sensory deficit to be in the region of one per cent while Blackburn & Bramley (9) report an incidence of half a per cent.

Surgical factor is very important factor to reduce the lingual nerve damage as this study ensures, this is consistent with a number of studies pointed to elevation of lingual flap as the most important factor causing lingual nerve damage (9,25). As well as the incidence of lingual nerve injury can be reduced by good skill surgeons this finding of this study is consistent with the finding of McGurk(26) and Haskell that attempted recently to rationalize the argument surrounding the relationship of surgical technique and of operator to lingual nerve morbidity during wisdom tooth removal.

Specialists with an optimal skill base should be able to use either technique as long as audit shows that their performance is better than currently published standards (25).

Previous studies have shown that such an incidence may relate to the surgeon's experience, improper use of the forceps and proper instrument handling (12), this study is consistent with this opinion that we can reduce the incidence of lingual nerve injury during third molars surgery through surgeon's experience and proper use of forceps with proper instrument handling especially drilling instruments as burr and handpiece at lingual plate of impacted lower third molar.

From an international standpoint, removal of impacted third molar under local anaesthesia and the willingness of purchasers to pay for it that reducing the incidence of lingual nerve injury as possible as can by help these factors; surgeon's experience, surgery factors, and proper evaluation of case.

REFERENCES

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Incidence of injury