

Lingual nerve injury following surgical removal of mandibular third molar

Received: 15/7/2016

Accepted: 20/11/2016

Abduljaleel Azad Samad*

Abstract

Background and objective: The close proximity of lingual nerve in relation to the lingual cortical bone of the posterior mandibular third molar is clinically important because lingual nerve may be subjected to trauma during surgical removal of the impacted lower third molar. This prospective study aimed to evaluate the incidence of lingual nerve paresthesia following surgical removal of mandibular third molar in College of Dentistry, Hawler Medical University.

Methods: A total of 116 third molars surgery were carried out under local anesthesia for 116 patients for removal of lower mandibular teeth Using Terence Ward's incision made in all cases, and after that, the buccal flap was reflected, lingual tissues had been retracted during bone removal with a periosteal elevator. The sensory disturbance was evaluated on the 7th postoperative day by standard questioning the patients: "Do you have any unusual feeling in your tongue, lingual gingiva and mucosa of the floor of the mouth?"

Results: One patient experienced sensory disturbance, the lingual nerve paresthesia incidence was 0.9% as a transient sensory disturbance, while no patient of permanent sensory disturbance.

Conclusion: The incidence of injury to the lingual nerve can be minimized by careful clinical evaluation, surgeon's experience, surgical approach and knowledge about anatomical landmarks during surgical removal of an impacted lower third molar tooth.

Keywords: Impacted lower third molar; Lingual nerve paraesthesia.

Introduction

The surgical removal of impacted mandibular third molar is associated with minor and expected complications such as pain, swelling, bruising, bleeding and trismus.¹ Despite these complications, there are serious and often discussed postoperative complications that arise from third molar surgery is injury to trigeminal nerve, specifically, involvement of either the inferior alveolar or lingual nerve.²⁻⁴ The lingual nerve damage sometimes occurs after the removal of mandibular third molar producing an impaired sensation or permanent sensory loss and discomfort to the patient. This complication is usually unexpected and unacceptable for the patients if no prior warning has been given.¹ Lingual nerve being primary sensory nerve of tongue and tongue

coordinating speech, taste sensation, swallowing, mastication, so any disturbance in lingual sensation can affect individuals functionally as well as psychologically. The reported prevalence of sensory disturbance to lingual nerve after surgical removal of the third molar is 0.2–23 %.⁵⁻⁷ The incidence of lingual nerve damage can also occur due to general practitioner's inexperience, surgical approach and certain precise factors inclusive of raising and retracting a lingual mucoperiosteal flap with a periosteal elevator.⁸ Hence consequently this prospective clinical study was undertaken to assess the incidence of lingual nerve paresthesia in individuals who have undergone surgical extraction of impacted mandibular third molars under local anesthesia in College of

* Department of Oral and Maxillofacial Surgery, College of Dentistry, Hawler Medical University, Erbil, Iraq.

Dentistry, Hawler Medical University.

Methods

One hundred and sixteen patients were undergone surgical removal of mandibular third molar at Oral and Maxillofacial Surgery Department of College of Dentistry - Hawler Medical University from January 2014 to December 2015. Preoperative evaluations such as tooth position, depth of impaction and bony coverage have been taken into consideration by the use of orthopantomograph (OPG). The impacted mandibular third molars were categorized by the "Winter's classification" (Figure 1). To minimize the chance of lingual nerve damage the usual Terence Ward's incision made in all cases (Figure 2), and after that, the buccal flap was reflected, lingual tissues had been retracted during bone removal with the periosteal elevator. The bone removal carried out in the mesio buccal region to make a gutter and then sometimes distally according to the cases with the assist of surgical bur and hand

piece with continuous irrigation of normal saline. Then the teeth were extracted and then the flap repositioned and sutured by a 3-0 silk to close the wound. The sensory disturbance was evaluated on the 7th postoperative day (the day of suture removal) and any complaint regarding sensory disturbance of the lingual gingiva and mucosa of the floor of the mouth and tongue was recorded. Assessment of postoperative complication was done by standard questioning, as an example: "Do you have any unusual feeling in your tongue, lingual gingiva and mucosa of the floor of the mouth?" Patient with any complaint associated with the sensory disturbance on postoperative evaluation was advised for ordinary observe up at the interval of one month and up to six months if paresthesia persisted, and no any medicine was used to speed up the curing process of nerve injury. The statistical package for the social sciences (SPSS, version 22) was used for data entry and analysis.

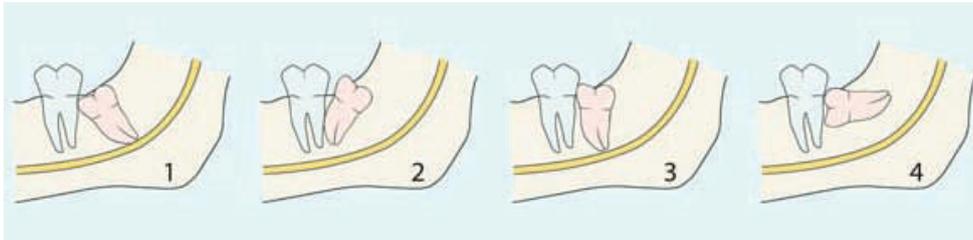


Figure 1: Classification of impacted mandibular third molars, according to "Winter's classification". (1 Mesioangular, 2 Distoangular, 3 Vertical, 4 Horizontal)

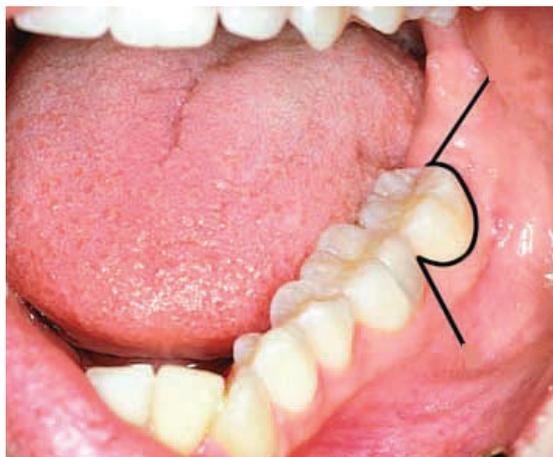


Figure 2: Terence Ward's incision for surgical removal of lower impacted wisdom tooth.

Results

One hundred and sixteen patients had participated in the present study. The age of the patients in our study ranged from 19-33 years (mean age 26.61 years: SD 4.517). Sixty five (56%) were females and fifty one (44%) patients were males. The impacted mandibular third molars were categorized by "Winter's classification" and illustrated in Table 1. Out of 116 patients, one patient (0.9%) was diagnosed with lingual nerve paresthesia on 7th postoperative day evaluation (Std. Deviation of 0.093). In this patient, the paraesthesia was recovered within two months of observation. The factors possibly contributing to lingual nerve paresthesia in this case were analyzed. The lingual nerve

paresthesia (paresthesia of side and tip of the tongue) occurred after removal of left side impacted molar because of needle trauma during giving the anesthesia for surgery. The detailed history taken from this patient showed that he encountered the sensation of an unpleasant electric shock on insertion of the needle for an inferior alveolar nerve block due to the fact the needle has come into contact with the nerve. The anesthesia was given by a 5th stage student of College of Dentistry, Hawler Medical University because in this college the student can give anesthesia to the patients of minor oral surgery under the supervision and then the surgery was done by the specialist surgeon (Figure 3).

Table 1: Types of angulation of impacted tooth.

Types of impacted tooth angulation	No. %
1 Mesioangular	51 (44%)
2 Vertical	39 (33.6%)
3 Horizontal	18 (15.5%)
4 Distoangular	8 (6.9%)
Total	116 (100%)

**Figure 3:** Orthopantomograph of the patient that encountered lingual nerve paresthesia.

Discussion

Previous studies have shown the incidence of damage to the lingual nerve following mandibular third molar surgery varied from 0.2–23 %.⁵⁻⁷ The incidence of temporary nerve paresthesia in our study is in keeping with these studies. The incidence of permanent damage of lingual nerve during third molar surgery was much lower than the incidence reported by Bataineh.⁹ Surgical factor is very important factor to reduce the lingual nerve damage as this study ensures; this is consistent with a number of studies that found the elevation of lingual flap as the most important crucial element inflicted in lingual nerve injury.⁸ The incidence of lingual nerve injury can be decreased via talent surgeons with good skills this finding of this study is consistent with the finding of McGurk and Haskell.¹⁰ They attempted recently to rationalize the argument surrounding the relationship of the surgical method and operator to lingual nerve morbidity during wisdom tooth removal. Specialists with an optimal skill base should be able to use both techniques as long as audit shows that their performance is higher than currently published standards.⁸ Previous studies have proven that such an occurrence may relate to the surgeon's experience, unsuitable use of the forceps and proper instrument handling.¹¹ This study is consistent with this opinion that we can lessen the incidence of lingual nerve injury during third molars surgery through surgeon's experience and proper use of forceps with proper instrument handling mainly drilling instruments such as burr and handpiece at the lingual plate of the impacted lower third molar. In our study out of 116 patients, one patient (0.9%) was diagnosed with lingual nerve paresthesia; this patient encountered the sensation of an unpleasant electric shock" on insertion of the needle for an inferior alveolar nerve block due to the fact the needle has come into contact with the nerve. Estimates indicate a prevalence of transiently impaired lingual and inferior alveolar nerve function ranging

in the order of the size of 0.15-0.54%^{12,13} whereas permanent injury caused by injection of local analgesics is much less frequent, 0.0001–0.01%.^{12,14,15} Various views have been expressed to explain the mechanism of nerve injury after anesthetic injection.¹⁷ Direct physical fascicular damage can be resulting from a penetrating injection needle, or by way of a damaged injection needle on withdrawal after bone contact.^{12,13,16} Intraneural bleeding may exert pressure, and subsequent constrictive scarring may obstruct nerve conduction.¹⁷ Finally, Hass and Lennon¹⁵ stated that local anesthetic formulations might show the capacity to develop neurotoxicity, specifically Articaine 4% and Prilocaine 3-4%.

Conclusion

Lingual nerve paresthesia is a rare complication after removal of the mandibular third molar. Hence, care needs to be taken for all the patients undergoing surgical removal of lower third molars with probable significant factors need to be taken to keep away from lingual nerve injury. Patients must be informed about the outcomes and complications and written consent has to be obtained.

Conflicts of interest

The author reports no conflicts of interest.

References

1. Carmichael FA, McGowan DA. Incidence of nerve damage following third molar removal. *Br J Oral Maxillofac Surg* 1992; 30:78-82.
2. Blondeau F, Daniel NG. Extraction of impacted mandibular third molars. *J Can Dent Assoc* 2007; 73:325-8.
3. Susarla SM, Blaeser BF, Magalnick D. Third molar surgery and associated complications. *Oral Maxillofac Surg Clin N Am* 2003; 15:177-86.
4. Lopes V, Mumenya R, Feinmann C, Harris M. Third molar surgery: an audit of the indications for surgery, post-operative complaints and patient satisfaction. *Br J Oral Maxillofac Surg* 1995; 33:33-5.
5. Loescher AR, Smith KG, Robinson PP. Nerve damage and third molar removal. *Dent Update* 2003; 30:375-82
6. Gomes AC, Vasconcelos BC, de Oliveira e Silva ED, da Silva LC. Lingual nerve damage after

- mandibular third molar surgery: a randomized clinical trial. *J Oral Maxillofac Surg* 2005; 63:1443-6.
7. Robinson PP. Textbook and colour Atlas of tooth impaction. 1st ed. Laskin DM: Munksgaard, Copenhagen; 1997.
 8. Blackburn CW, Bramley PA. Lingual nerve damage associated with the removal of lower third molars. *Br Dent J* 1989; 167:103-7.
 9. Bataineh AB. Sensory nerve impairment following mandibular third molar surgery. *J Oral Maxillofac Surg* 2001; 59:1012-7.
 10. McGurk M, Haskell R. Wisdom tooth removal and lingual nerve damage. *Br J Oral Maxillofac Surg* 1998; 37:253-4.
 11. Benediktsdottir IS, Wenzel A, Petersen JK, Hintz H. Mandibular third molar removal risk indicators for extended operation time, postoperative pain, and complications. *Oral Surg Oral Med Oral Path Oral Radiol Endod* 2004; 97:438-46.
 12. Harn SD, Durham TM. Incidence of lingual nerve trauma and postinjection complications in conventional mandibular block anaesthesia. *J Am Dent Assoc* 1990; 121:519-23.
 13. Krafft TC, Hickel R. Clinical investigation into the incidence of direct damage to the lingual nerve caused by local anaesthesia. *J Craniomaxillofac Surg* 1994; 22:294-6.
 14. Haas DA, Lennon D. A 21 year retrospective study of reports of paresthesia following local anaesthetic administration. *J Can Dent Assoc* 1995; 61:319-30.
 15. Pogrel MA, Thamby S. Permanent nerve involvement resulting from inferior alveolar nerve blocks. *J Am Dent Assoc* 2004; 131:901-7.
 16. Stacy GC, Hajjar G. Barbed needle and inexplicable paresthesias and trismus after dental regional anaesthesia. *Oral Surg* 1994; 77:585-8.
 17. Hillerup S, Jensen R. Nerve injury caused by mandibular block analgesia. *Int J Oral Maxillofac Surg* 2006; 35:37-43.