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THIRD MOLAR EXTRACTION AND ITS EFFECTS ON TASTE FUNCTION

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Abstract

To study the effect of third molar extraction on taste. To check if the taste function was affected after the third molar extraction. Third molars are widely known to be associated with the lingual nerve. During third molar extraction there are chances for the lingual nerve to get damaged. The lingual nerves help in taste function and damage to this nerve may have effects on the taste function. A study was conducted involving patients undergoing third molar extraction. Their taste function before the extraction and after the extraction was monitored. The patient was given some kind of liquid food like fruit juices which was not very cold and his taste function was recorded before the extraction. Then the same procedure was done after the extraction and the taste function was recorded. The then differences in the taste function of the particular patient was noted. To check if the taste function was affected after third molar extraction due to effect of the lingual nerve.

Keywords: Third molar, Extraction, Lingual nerve damage, Gustatory, Taste function.

Introduction

Third molar may be partially or totally unerupted. Impacted third molar removal is one of the most commonly performed surgical procedure in oral and maxillofacial surgical practice. The teeth may also be removed due to pain or for preventive measure to avoid crowding, impactions of other teeth and pericoronitis[1].To prevent complications impacted lower tooth should be removed .The indications for extraction include recurrent

pericoronitis, cellulitis, abscess, osteomyelitis, cysts and tumors involving the third molars, unrestorable caries or periodontal breakdown and prophylactic removal in the presence of medical or surgical conditions, among others[2]. Impacted mandibular third molar teeth are in close proximity to the lingual, inferior alveolar and mylohyoid nerves. During surgical removal, each of these nerves is at risk of damage, but most of the complications result from inferior alveolar or lingual nerve injuries[3]. The majority of injuries result in transient sensory disturbance but, in some cases, permanent paraesthesia(abnormal sensation), hypoesthesia (reduced sensation), or, even worse, some form of dysaesthesia (unpleasant abnormal sensation) can occur.

LN injuries may determine sensory (anesthesia, paraesthesia, or dysesthesia) and taste disturbances of the anterior two-thirds of the tongue, giving rise to several problems, such as inability to maintain food and liquid competence, tongue biting, a burning sensation of the tongue, anesthesia resulting in burns during eating and drinking, pain, change in speech pattern, and a change in taste perception of food and drink[4].Most of these sensory disturbances are temporary and recover spontaneously with time, but in a few cases fail to recover and result in permanent neurosensory disability and loss of sensory function. The choice of anesthesia for third molar removal has an indirect effect on the nerve injury. The aim of this study is to find the variations in the taste function following third molar extractions.

Materials and methods

A total of 31 patients who were about to undergo mandibular third molar extraction were selected for the study. The clinical variables collected were: age, gender, weight, soft tissue and bone coverage (none, partial or total) of the third molar. The position of the third molar was determined on panoramic radiograph.. The statistics was done using SPSS statistics.

Gustatory perception test

The purpose of this test was to monitor the response of the patient to 3 different types of liquid which are Salt water, lemon juice and sugar solution which were taken in 5ml and given in the area of the third molar where the patient had to undergo surgery[5]. This was also done 1 week after the surgery was done and after 1 month.

Neurosensory questionnaire

A set of 3 questions were prepared for the patient to answer after the patient had undergone the extraction. This questionnaire was associated with the sensibility of the patient to the taste function. This was done after 1 week and after 1 month after the extraction.

Result

A study involving 31 patients which involved 17 females and 14 males with a mean age of 35.7 and mean weight of 59.2 were involved in the study.

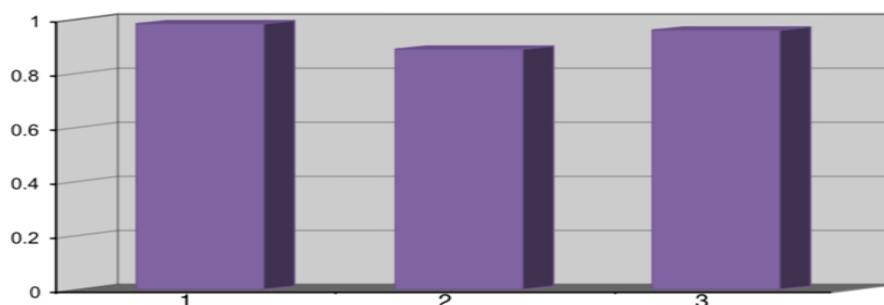
Gustatory perception test

There was not much difference in the ability to sense the taste. The changes were not very significant because the patient was unaffected in taste function after surgery. There was a 9% decrease in the ability to sense the taste the liquid food items after the 1st week of surgery and this became only a 2% decrease after 1 month after surgery when compared to the initial ability to taste which was measured before the surgery[6]. There was 6% increase in taste function when compared with the 1st week and 1 month after the extraction. This was due to the slight injury to the lingual nerve caused during the mandibular third molar extraction surgery. But there was a difference in each patient as to how much there was a difference this may be due to various types of nerve injuries. Lower third molar removal under local anesthesia may cause light lingual sensibility impairment also. Most of these alterations remain undetected to patients. These lingual nerve injuries are present one week after the extraction and recover one month after surgery. The taste seems to remain unaffected after these procedures[7]. This has been given in table 1 and table 2.

Table-1. Differences in taste function after third molar extraction.

Liquid food	Pre- op (before surgery) Taste p value	Post-op (after 1 week) Taste p value	Post-op (after 1 month) Taste p value
Salt water	0.95	0.85	0.90
Lemon juice	0.95	0.85	0.90
Sugar water	0.95	0.85	0.90

Table-2. Graph showing differences in taste.



1- Pre-op**2- Post-op(1 week)****3- Post-op(1 month)**

Neurosensory questionnaire

Table-3. Neurosensory questionnaire

1).	Have you experienced any taste changes after the extraction?
2).	Has the taste loss been permanent or temporary?
3).	Has there been any permanent loss of taste function after the extraction?

None of the patient referred subjective alterations in either sensibility or gustatory functions. The patients did not complain of any significant changes in the taste function[8].This questionnaire is given in table 3.

Discussion

A total of 17 females and 13 males who had undergone third molar extractions were included in the study with the mean age group of 35.7 and mean weight of 59.2.

In the study above the taste sensation reduce by 9% in the first week of surgery which reduced to 2% after one month. There was a 6% increase in taste following one month of extraction when compared with a week. This difference in taste function could be caused due to the temporary damage to the nerve that could have been caused by trauma from instruments.

Several nerves responsible for the transmission of general sensory stimulus may be damaged during dentoalveolar surgery procedures. Although these complications are infrequent after the extraction of lower third molar. A nerve injury may be caused by injection of local anesthetic as a result of mechanical (by direct contact with the needle) or chemical (due to the neurotoxic effects of the anesthetic compounds) action[9].However, in a retrospective analysis of paresthesias diagnosed after injection of local anesthetic, it was observed that the estimated incidence was extremely low Patients experienced a change in taste sensitivity which ranged from 5% to 9%. This difference in taste sensation might have been due to the differences in the extent to which the nerve was damaged.[10]

Although gustatory disorders and oral surgical procedures have frequently been reported, much of the literature is based on case studies resulting from damage to the chorda tympani after middle ear surgery[11]. However, several articles report unilateral taste change, sensory (anesthesia, dysesthesia or paresthesia) changes and nerve damage after surgical procedures involving the removal of third molar[12]. Shafer and others showed that perceived taste intensity on discrete areas of the tongue was significantly reduced after third molar surgery, and patients with the most severely impacted molars gave the lowest taste intensity ratings to whole-mouth test solutions. They also found that removal of severely impacted molars could cause partial or complete transection of nerves resulting in gustatory deficits[13]. Surgical procedures requiring lingual flaps, tooth sectioning or the insertion of a periosteal elevator can all be linked to taste dysfunction following third molar extraction.

Judgment can be made based on various systems for classification of nerve injuries, first is the Seddon's classification that is Neuropraxia i.e. an interruption in conduction of the impulse down the nerve fiber. The recovery in such cases takes place without Wallerian degeneration and hence it is considered to be the mildest form of nerve injury[14].

Another system which is commonly followed was given which includes five classes as follows[15]. First-degree: It is similar to Seddon's neuropraxia and due to compression or ischemia, a local conduction block and focal demyelination occur which recovers in 2- 3 weeks.

The lingual nerve carries taste fibers from the anterior two-thirds of the tongue, and it is not completely affected during the third molar extraction. These injuries only cause slight differences which do not cause much differences[16].

Mandibular third molar extraction is a very commonly carried out procedure in day to day dental practice and is undoubtedly associated with few risks especially neural injuries and therefore, a thorough evaluation of the risks and benefits from surgery is of utmost importance, both for patient benefit and safety from litigation for the dentist[17]. In the modern dental era, where evidence-based practice enables a clinician to utilize the available evidence to allow the best treatment outcomes, it would be wise to take up cases in which extraction is justified and based on clear cut indications, and also where the benefits outweigh the risks involved in the procedure[18]. Further, a mandatory post-operative assessment should be made at timely intervals, to diagnose the complications that arise at an earlier stage and enable quick recovery by initiating timely treatment.

Another possible mechanism for nerve damage is the use of local anesthetic. Direct contact with the needle used to inject anesthetic traumatizes the nerve and produces a prolonged change in sensation. However, paresis caused by shearing of the nerve as a result of direct trauma is unlikely because of the small diameter of the needle (0.45 mm in a 25-gauge needle) compared with the 2–3 mm diameter of the lingual and inferior alveolar nerves[19]. Intra-neural hematoma caused by the needle striking one of the smaller intra-neural blood vessels is a possible cause of nerve damage. If the needle contacted one of the small blood vessels inside the nerve, the release of blood and blood products inside the epineurium could cause compression, brosis and scar formation[20]. Compression of the nerve could result in damage and inhibit or alter the natural healing process. Chemical damage to the nerve due to neurotoxicity of the local anesthetic is another possibility if the anesthetic is injected intrafascicularly or becomes deposited within the nerve as the needle is withdrawn[21]. Local anesthetics (articaine, procaine, tetracaine, bupivacaine or lidocaine) can all be neurotoxic when injected directly into the nerve[22]. Chemical trauma as a result of these has been shown to cause demyelination, axonal degeneration and in ammation of the surrounding nerve fibers within fascicles , which results in a breakdown of the nerve–blood barrier and endoneurial edema[23].

Conclusion

Thus, the third molar extraction does not cause significant changes in the taste function, but there is a small level to which the patients taste function is affected in this study .Most of these alterations remain undetected to patients. These lingual nerve injuries are present one week after the extraction and recover one month after surgery.

Conflict of Interest: We declared that this review does not have any conflict of interest.

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