

Post-Tonsillectomy Taste Distortion; Evaluation of Surgical Causes of an Unusual Complication

Chowdhury NH¹, Kabir MA², Islam MA³, Kazi MM⁴, Khan SR⁵

Abstract

Objective: Tonsillectomy is nevertheless associated with certain complications. These include referredotalgia, reactionary hemorrhage, velopharyngeal insufficiency, burns of uvula, soft-tissue injury, dento-mandibular trauma. The agonizing complication is altered taste or temporary loss of taste sensation. In this article, the authors reports 9 new cases of taste disturbance one to six months after surgery and evaluate the surgical causes of this unusual complication. Authors also recommends modification of cold steel dissection method and Diathermy coagulation methods for tonsillectomy to avoid post operative taste distortion as taste sensation loss creates a significant psychological impact on the life of patient.

Key words: Taste Distortion, Tongue Compression, Tonsillectomy.

Introduction

Tonsillectomy is one of the most commonly performed procedures in ENT. Gustatory dysfunction is an uncommon complication following tonsillectomy with a potential impact on the quality of life. As with any surgery, head and neck surgeons must be aware of possible complications and their potential effects even though rare. Taste disturbance is an unusual complication of tonsillectomy of which there are very few reports in the literature. The possible causes of this rare complication are: (1) direct or indirect damage to the glossopharyngeal nerve or its lingual branch (LBGN) (2), microcirculatory jeopardy to tongue due to prolong compression time, and (3) habitual drug intake.¹ We report taste disturbance following tonsillectomy that was performed for chronic tonsillar hypertrophy. During surgery, hypertrophic tonsils were found to be sited deeply into the tonsillar bed, especially at the lower pole of the tonsil, Pathologic examination revealed chronic infection at the tonsil, and lymphoid hyperplasia at the lower pole. Serum zinc value and habitual intake of any drug that could affect the sense of taste. Depending on the world literature possible indirect damage to the LBGN was suspected as the cause of the taste disturbance. This symptom may be reversible within two years after tonsillectomy, but it can also be irreversible.² Therefore, tonsillectomy should be performed with minimal trauma to the tonsillar bed, especially when there is pathology extends beyond the lower pole. Such a patient should be informed about the risk of post-operative taste disturbance after tonsillectomy as being one of the rare & unusual complications of tonsillectomy. Many of the surgeons are unaware about such type of complication. Authors tried to evaluate the exact cause of taste disturbance at per-operative period are the 1). Direct injury to lingual branch of the glossopharyngeal nerve due to

over enthusiastic dissection beyond the lower pole of tonsils and 2) microcirculatory compromise to taste receptors as cyanosis occurs due to prolong compression of tongue tissue.³ Transient taste perception changes seem to be relatively frequent after tonsillectomy. Gustatory symptoms can occur even after uneventful tonsillectomy. Informed consent should include post-tonsillectomy gustatory dysfunction.

Objective

This article report, the per-operative surgical technique to avoid such unusual complication that seriously hampers the quality of life of the patient. Our center is large tertiary level hospital in Bangladesh. We are capable of handling large number of patient volume yearly in ENT & HNS dept., operating near about 100 tonsillectomy patients yearly. A study of last 14 years since 2005 to 2019, 600 adult patient underwent tonsillectomy; mean age group is 25-35 years. Among them 9 patient complaints for taste disturbance after 30 days of operation. This patient kept under regular surveillance and monitoring for a period of 6 months. Taste distortion after tonsillectomy documenting by clinical, and subjective evaluation. The clinical course of a patient with taste distortion after a tonsillectomy is described. The gustatory function was investigated by spatial taste testing. Threshold measurements were determined at three left- and three right-side tongue regions: 1) the tongue tip region (innervated by the chorda tympani branch of the facial nerve), 2) the lateral margin of the tongue (anterior to the foliate papillae), and 3) the posterior tongue region (innervated by the lingual branch of the glossopharyngeal nerve).

STUDY DESIGN

Study type :	prospective study
Study period :	14 years since 2005 to 2019.
Study place:	Bangladesh Medical College
Study Sample number :	600 patients
Study population :	Young Adult (mean age group 25-35 years)
Evaluation period :	1 month to 6 months after operation.
Sampling type :	Random sampling
Evaluation method:	

1. Dr. Nazmul Hossain Chowdhury, Assistant Professor, Dept. of Otolaryngology-Head & Neck Surgery, Bangladesh Medical College.

2. Dr. Md. Ahmedul Kabir, Associate Professor, Dept. of Periodontology & Oral Pathology, Bangladesh Dental College.

3. Dr. Md. Ashrafal Islam, Professor, Dept. of ENT & HNS, Bangladesh Medical College.

4. Dr. Md. Milon Kazi, Assistant Registrar, Dept. of ENT, Bangladesh Medical College.

5. Dr. Saif Rahman Khan, Assistant registrar, Dept. ENT, National Institute of ENT.

Taste distortion persisted upto 1 month post operatively-
Transient taste distortion

Taste sensation regained within 6 month - Temporary taste distortion.

Taste distortion persisted after 6 month – permanent taste distortion.

Inclusion criteria

- 1) patient complaining of post operative taste distortion.
- 2) Patient not regaining taste sensation after 1 month of operation.
- 3) adult patient mean age group 25-35 years.

Exclusion criteria

1. Pediatric age group (below 16 years).
2. Patient having history of chronic rhinitis.
3. Patient history of habitual drug intake.
4. Patient having history of diabetes mellitus.

Results

Table -I : Patient age group

Age group	No. of Patient Operated	No. of patient developed transient taste distortion	No. of patient developed temporary taste distortion
16-20 years	200	83	0
21-25 year	145	110	1
26-30 years	125	95	5
31-35 years	85	62	3
36-40 years	45	21	0

Result: Rate of taste distortion more common in 26-35 years age group.

Table II: Sex

Sex of patient	No. of patient
Male	345
Female	255

Table III: patient complaint of post - operative taste distortion

Sex	No of patient operated	No. of patient complaint of taste distortion	Percentage
Male	345	203	59%
Female	255	168	66%

Result : Rate of post operative taste distortion slightly higher in female.

Table IV: Patient regained taste sensation within 1 month of operation (transient taste distortion)

No. of patient with transient taste loss	No. of patient improved	Percentage
Male	203	98.50%
Female	168	96.42%

Result : More than 95% of patient regain taste perception after wound healing.

Table V: Patient not regained taste sensation within 6 months of operation (Temporary taste distortion)

No. of patient operated	No. of patient with temporary loss of taste perception	Percentage
Male	345	3 0.86%
Female	255	6 2.35%

Result : post tonsillectomy loss of taste perception may vary from less than 1% to 2.35%. Incidence rate is slightly more in female.

Table-VI : Methods of operations applied

Methods	No. of Patient operated	No. of patient with temporary taste distortion	Per centage
Cold steel dissection	345	4	1.15%
Coagulation Diathermy	196	2	0.51%
Snare Dissection	60	0	
LASER surgery	6	0	

Result : Rate of neural injury to lingual br. Higher in dissection method.

Table-VII : Duration of operation

Operating time	No. of patient with taste distortion
20 - 30 minutes	0
30 - 45 minutes	1
45 -60 minutes	3

Result: Incidence rate is higher if Operating time takes more than 30 minutes.

Table-VIII :Method of hemostasis applied

Hemostatic method	No. of patient with taste distortion
Gauge pressure	0
Uni -polar diathermy	2
Bipolar diathermy	0

Result : Use of unipolar diathermy at lower pole for hemostasis may cause neural injury.

Table-IX : Result of blind folded subjective taste test With different taste agent.

Bilateral loss		Unilateral loss	
Anterior 2/3rd	Posterior 1/3 rd	Anterior 2/3rd	Posterior 1/3rd
0	2	0	4
3	0	0	0

Result : In anterior 2/3rd region 3 patient loose bilateral taste perception due to massive tongue compression >30 minutes and in posterior 1/3rd region due to surgical injury and heat eviction by unipolar diathermy to lingual br. Of glossopharyngeal nerve.

Table-X : Evaluated causes of taste distortion

Method	Bilateral loss	Unilateral loss
Cold dissection method	1	3
Uni -polar diathermy	1	1
Operating time >30 minutes	3	0

Result : out of 9 patient 4 develops taste distortion in posterior 1/3rd region due to surgical injury by serrated tonsillar dissector, 2 patient due to neural injury by unipolar diathermy heat eviction and 3 patient due to massive cyanosis by tongue compression > 30 minutes.

Discussion

After a complete clinicaevaluation and taste testing, it was found that the patient suffered an injury to the lingual branch of the glossopharyngeal nerve. The close anatomic relationship between the palatine tonsil and lingual branch of the glossopharyngeal nerve makes the nerve vulnerable during tonsillectomy.⁴ This injury has caused the patient to suffer ageusia to the posterior one third of the tongue. We propose that this temporary loss of taste sensation mainly in posterior third of tongue is due to microcirculatory delay to sensory nerve ending in taste buds due to prolong compression by tongue blades which is evident by development of massive cyanosis of tongue under compression. We also documented our experience of taste loss in posterior third of tongue is due to extensive dissection of tonsillar tissue in lower pole where lingual br. of glossopharyngeal nerve vulnerable to injury. More than 50% of patient initially complaint for transient taste disturbance but this recovers in between 21st to 30th post operative period were excluded. These patients improve after allowing period for wound healing. The patient who did not (n- 9) recover within 30th day after operation were assessed and kept under surveillance and regular follow up by subjective taste test with different taste agent. All the patient found recover and improve within 6 months period (1.5%). Proper counseling and reassurance are utmost importance in the management of such types of complication to prevent psychological impact on patient. In our study we found rate of taste distortion more common in 26-35 years of age group. Rate of post operative taste distortion is slightly higher in female. More than 95% of patients regain their taste perception after wound healing. Post tonsillectomy loss of taste perception may vary from less than 1% to 2.35%. Incidence rate is slightly more in female. The rate of neural injury to lingual br. of glossopharyngeal nerve higher in cold steel dissection method. Incidence rate is higher if operating time takes more than 30 minutes. The most 2 important causes evaluated in our study that lead post operative loss of taste perception. Use of unipolar diathermy at lower pole of tonsils for hemostasis may cause neural injury due to thermal eviction - is another important region for taste distortion. In anterior 2/3rd region 3 patient loose bilateral taste perception

due to massive tongue compression when duration of operation exceed >30 minutes and in posterior 1/3rd region due to surgical injury and heat eviction by unipolar diathermy to lingual br. of glossopharyngeal nerve. Out of 9 patient 4 develops taste distortion in posterior 1/3rd region due to surgical injury by serrated tonsillar dissector, 2 patient due to neural injury by unipolar diathermy generated thermal eviction and 3 patient due to massive cyanosis by tongue compression with mouth gag when per operative delay takes time > 30 minutes.

This study was undertaken to evaluate the incidence rate of post tonsillectomy dysgeusia and its relationship to the extension of surgical wound, surgical technique and operating time. 600 patients who had undergone tonsillectomy at a single tertiary care research based institute were reviewed. Among them 371 patient reported in OPD with the complaints of post operative loss of taste perception. Clinical examination include- evaluation of the patient's history and psychophysical testing with cottons soaked in bitter, sweet, sour salt after 30 days of operation to 6 months following tonsillectomy. Operation time, methods to achieve hemostasis and period of wound healing were also included. Subjective taste dysfunction was registered in 9 patients after 30 days of surgery. In all patients this dysgeusia regressed within 6 months. Routine postoperative follow up at 7th and 14th POD revealed transient taste changes in more than 50% of patient but > 95% recovered within 30th POD probably due to complete wound healing and resolution of surgical edema. Investigated factor such as operating time, or hemostatic technique with unipolar diathermy, time for wound healing were also associated with the occurrence of transient taste disturbance.⁵

Depending on what study you look at, this complaint occurs anywhere from 0.3% to as high as 9% of tonsillectomy cases according to world literatures. Dysgeusia after tonsillectomy is felt to be due to a number of different causes including-1) massive tongue compression >30 minutes 2) Injury to lingual br. of glossopharyngeal nerve.⁶ post-tonsillectomy taste dysgeusia may result from surgical injury, tongue compression, inflammatory processes or side effects of local anesthetics.⁷ prolonged tongue depression from a mouth gag that's inserted during a tonsillectomy could bring greater potential for a taste disturbance especially in adults. Tonsillectomies in adults often take longer duration, because the tonsil tissue tends to be more scarred down, and the operation tends to be bloodier. We tried not to press the tongue for too long. If the surgery is taking a little longer duration, we took the patient out of the mouth gag and let their tongue rest a little bit, get the blood flow going and then re-suspend them.⁸ While many tonsillectomies are still performed by the traditional scalpel method, It's theorized that the residual cuff of tonsil tissue acts like a biological Band-Aid during the healing process, so that smaller caliber vessels affected, and the healing process can occur at a more superficial

level, have the potential to decrease the risk of direct injury to the lingual branch of the glossopharyngeal nerve. There are some patients complain of taste disturbance after tonsillectomy. Actual measurement of the distance between the lingual branch of the glossopharyngeal nerve, which controls taste in the posterior portion of the tongue, and the lower pole of the palatine tonsil, using a cadaver, showed the distance to be only 2-4 mm, thereby suggesting the danger of direct or indirect disturbance of this nerve by tonsillectomy. Among the 371 outpatients complaining of taste disturbance whom we have treated at our center in the last 14 years, 9 (1.5%) were found to be suffering from temporary taste distortion triggered by tonsillectomy. Among these 9 cases, the taste disturbance In 6 cases caused by direct or indirect damage to the lingual branch of the glossopharyngeal nerve, whereas in another 3 cases taste disturbance initiated by tonsillectomy but actually caused due to prolong compression of tongue by boyle's Davis mouth gag. It is therefore important that patients must be informed regarding the risk of post-operative taste disorder following tonsillectomy, at the time of informed consent for tonsillectomy is obtained. It is equally important to ask the patients what drugs, if any, they take habitually.⁹ In this study we found the incidence of taste distortion is slightly higher in female. The exact cause cannot be evaluated and needs further more study. We also found useunipolar diathermy at lower pole of tonsils during haemostasis is directly related to transient taste distortion. It is due to heat eviction and electrocaution to lingual branch of glossopharyngeal nerve.

Conclusion

This study specially recommends not dissecting hypertrophied tissues beyond the lower pole of tonsils to avoid injury of lingual branch of glossopharyngeal nerve as it lies within very close perimeter to lower pole tissue (2-3mm). Tonsillar tissue remains in lower pole after cold steel dissection of tonsils should be cauterized superficially with bipolar diathermy. This procedure reduces the incidence of post tonsillectomy taste distortion. Our long surgical experience and observation also recommend reducing operation time less than 30 minutes or releasing the pressure of mouth gag over tongue intermittently to prevent circulatory jeopardy to sensory nerve ending of taste buds. In our center we are following such technique and rate of incidence significantly reduced for the last few years.

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Correspondence

Dr. Nazmul Hossain Chowdhury

Assistant Professor
Otolaryngology-Head & Neck Surgery
Bangladesh Medical College
Email: caesar23rd@gmail.com