

Incidence of Hypertrophied Tonsils in Patients with Chronic Tonsillitis Selected for Tonsillectomy

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Abstract

Background: - The tonsil reaches its maximum size during the childhood, when it is more active, and gradually becomes smaller after puberty and diminishes considerably in size. The appearance of the tonsil, on examination of the throat, may give a misleading estimate of its size. Some tonsils appear to lie very much on the surface of the throat with only a shallow tonsillar fossa; Others are much more deeply buried in a deep tonsillar fossa, depending partly on its size but, probably more importantly, on the degree to which it is imbedded in to the tonsillar fossa.

Aim of the study: - To show the proportion of hypertrophied tonsils in patients with chronic tonsillitis selected for tonsillectomy.

Patients & Methods: - A Descriptive study was conducted within six months period (June 2005 – December 2005), in the E.N.T. department at Al-Yarmouk Teaching Hospital. A total of 50 patients were examined and a history of chronic sore throat and malodorous breath were recorded. Patients with obstructive sleep apnea, quinsy, recent acute tonsillitis or suspected malignancy were excluded. Tonsil size (Volume) was measured according pillars, and cervical lymphadenopathy was recorded.

Results: - Hypertrophied tonsils occurred in (41%) of patients selected for tonsillectomy with chronic tonsillitis.

Conclusions: - The clinical size (on inspection) of the tonsils is not always the real size (on Measurement) of them. The size of the tonsils clinically is of less importance as an indication for tonsillectomy.

Key Words: - Tonsillitis, Tonsillectomy, Hypertrophied Tonsils

Introduction: -

The tonsil reaches its maximum size during the childhood^[1], When it is more active, and gradually becomes smaller after puberty and diminishes considerably in size^[2]. The appearance of the tonsil, on examination of the throat, may give a misleading estimate of its size^[2]. Some tonsils appear to lie very much on the surface of the throat with only a shallow tonsillar fossa; Others are much more deeply buried in a deep tonsillar fossa^[2], depending partly on its size^[3] but, probably more importantly, on the degree to which it is embedded in to the tonsillar fossa⁽²⁾. From the clinical point of view, it has been suggested that tonsillar hypertrophy is a physiological process, indicating B-Lymphocyte proliferation, while sunken atrophic tonsils indicate a collapse of the B-Lymphocyte activity and a collapse of the defense Process^[4].

Aims of the Study are;

- 1-To recognize the incidence of the tonsils that are hypertrophied and those that are atrophied in patients undergoing tonsillectomy as surgical treatment for chronic tonsillitis.
- 2-To identify the relationships between the clinical size of the tonsils on inspection of the oropharynx and the real size of them on measurement after tonsillectomy.

Patients & Methods

This study was set out to evaluate 50 patients having tonsillectomy carried out at the ENT department in Al-Yarmouk Teaching Hospital.

Patients:-

A total of 50 patients were examined and a history of chronic sore throat was recorded.

Selection of Patients:-

This descriptive study was designed to identify important clinical features in patients with chronic tonsillitis. Patients with obstructive sleep apnea, Quinsy (Peritonsillar Abscess), recent acute tonsillitis or suspected malignancy were excluded from this study.

Method:-

All the 50 patients had been assessed prior to surgery by:

1-History: Complete history had been inquired, including details of sore throat in terms of frequency, duration and severity of the attacks; bad oral smell (Malodours Breath); dysphagia and odynophagia; irritative or dry cough; and enlarged cervical lymph nodes. Other ear, nose and throat symptoms were also asked about, in addition to previous medical and surgical histories.

2-Examination: Thorough general and otolaryngological examinations were made with particular attention to the condition of the diseased

tonsils using tongue depressor and head-light or head-mirror looking for appearance of the tonsils and its clinical size, presence of erythema of the anterior pillars, and presence of debris in the tonsillar crypts and examination of the neck for enlarged cervical lymph nodes (Jugulodigastric Group).

3-Investigations:

- A) Haematological tests, including complete blood picture; erythrocytes sedimentation (ESR); Blood group and Rh; bleeding time; clotting time and also prothrombin time or partial thromboplastin time in patients suspected to have bleeding tendency.
- B) Chest X-Ray.
- C) Electrocardiography (ECG), especially in older patients.

Surgical procedure:-

Types of tonsillectomy:- The first report of Tonsillectomy Was Made By The Roman Surgeon Celsus In 30 AD ^[5].

1-Guillotine Tonsillectomy; Fortunately It Is Seldom Used Nowadays ^[6].

2-Cold Knife (Steel) Dissection Tonsillectomy; Removal Of The Tonsils By Use Of A Scalpel Is The Most Common Method Practiced By Otolaryngologists Today ^[5].

3-Laser Tonsillectomy; Uses CO₂ Or KTP Laser To Vaporize And Remove Tonsil Tissue ^[5]. There Is Decreased Blood Loss And Hence It Is Useful In Patients With A Coagulopathy, But With Increased Total Operative Time, Increased Cost, Delayed Healing And No Significant Improvement In Level of Pain ^[7].

4-Electrocautery Tonsillectomy; Electrocautery Burns The Tonsillar Tissue And Assists In Reducing Blood Loss Through Cauterization ^[5] With A Significant Decreased Severity Of Pharyngeal Pain In The First Post-Operative Day, But There Is A Delayed Increase In Pain Morbidity ^[8, 9].

5-Bipolar Radiofrequency Ablation (Coblation) Tonsillectomy; This Procedure Produces an Ionized Saline Layer That Disrupts Molecular Bonds without Using Heat ⁽⁵⁾. It Reduces the Blood Loss

But Associated With Increased Post-Operative Pain and Of Higher Cost ^[10].

6-Harmonic Scalpel Tonsillectomy; Uses Ultrasonic Energy To Vibrate Its Blade At 55000 Cycles / Second Which Is Invisible To Naked Eye ^[5]. It Is Safe, Effective, And Efficient, But Unfortunately Of High Cost ^[8].

In this Study tonsillectomy was done under general anesthesia by dissection procedure in all the 50 patients. other procedures for tonsillectomy were not used in this study as they are associated with more or Less some loss of tonsillar tissue.

Measurement:-

As we know the tonsil is irregular in shape so its size (volume) was measured according to Archimedes's Law, which states that the volume of a subject immersed in a fluid is equal to the volume of the displaced fluid. The tonsils were taken directly after dissection and cleaned from blood clots, If present, to avoid error in the measurement of the volume; reducing the possibility of, smaller size due to dehydration, or extra volume due to blood clots. In the graduated glass tube containing normal saline. The differences in the level of the fluid in the graduate glass tube before and after Immersing of the tonsil in it represent its volume or size.

Results: -

This study involved 50 patients (100 tonsils) Had been evaluated to determine their size (volume) depending on Archimedes's Law.

A-Age Incidence:-

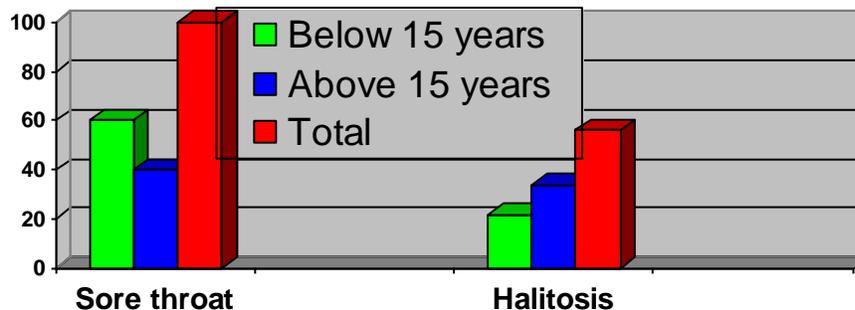
The age of the patients ranged between 5 years To 38 Years With A Mean Of 15.2 Years, Divided In To Two Groups One Below And The Other Above Age Of 15 Years, 30 (60%) Of Them Were Below 15 Years Old and 20 (40%) Were Above 15 Years Old, (Table 1).

Sex Incidence: - A 27 (54%) Of The Patients Were B-Males and 23 (46%) Were Females, (Table 1).

A- Incidence of the complaint:- All the patients (100%) complained of recurrent sore throat of duration between 2 years to 7 years. Halitosis was reported in 28 patients (56%), 11 (22%) of them were children and 17 (34%) were adults. Figure (1) incidence of complaint

Table (1) age & gender distribution.

Age of patients	Gender of patients				Total	
	Male		Female			
	No.	%	No.	%	No.	%
Below 15 years	15	30	15	30	30	60
Below 15 years	12	24	8	16	20	40
Total	27	54	23	46	50	100



As in Figure (1) incidence of complaint

B- Results of examination:-

1-Tonsillar debris: - 26 (52%) of the patients had tonsillar debris either on inspection or after squeezing the tonsils, 12 (24%) of them were below age of 15 years and 14 (28%) above 15 years old, (table 2).

2-Anterior pillars injection: - injection of the anterior pillars had been found in 43 patients (86%), 20 (40%) of them were below age of 15 years and 23 (46%) above 15 years old, (table 2).

3-Enlarged cervical lymph nodes:- The cervical lymph nodes particularly the jugulodigastric groups were found in 36 patients (72%), after out-patient

clinic and general anesthesia examination, 19 (38%) of them were below age of 15 years and 17 (34%) were above 15 years old, (table 2).

1-Size of the tonsil:-The clinical size of the tonsil (on inspection):- 23 patients had large tonsils, 18 of them (36%) were below age of 15 years and 5 (10%) of them were above 15 years old; and 27 patients (54%) had small tonsils, 12 of them (24%) were below age of 15 years and 15 of them (30%) were above 15 years old, (table 3).

Table (2) the frequency distribution patient's signs.

Signs	Age of patients				Total	
	Below 15 years		Above 15 years			
	No.	%	No.	%	No.	%
Tonsillar debris	12	24	14	28	26	52
Anterior pillar injection	20	40	23	46	43	86
Enlarged cervical nodes	19	38	17	34	36	72

Table (3) the frequency distribution size of the tonsils clinically.

Age of patients	Clinical size of tonsils					
	large		small		Total	
	No.	%	No.	%	No.	%
Below 15 years	18	36	12	24	30	60
Above 15 years	5	10	15	30	20	40
Total of patients	23	46	27	54	50	100

The objective size of the tonsils (on measurement):-

The size (volume) of the tonsils ranged between (1.7) to (9.6) cm³ with a mean of (5.023) cm³. There were (41) tonsils (41%) of larger size than that of the calculated mean, 20 (20%) of them for those above

age of 15 years and 21 (21%) for those below 15 years old; and (59) tonsils (59%) were of smaller volume, 39 (39%) of them for those below 15 years and 20 (20%) for those above 15 years old, (table 4,5).

Table (4) objective size of the tonsils.

Age of patients	Objective size of tonsils					
	large		small		Total	
	No.	%	No.	%	No.	%
Below 15 years	21	21	39	39	60	60
Above 15 years	20	20	20	20	40	40
Total of tonsils	41	41	59	59	100	100

Table (5) Compare the clinical and objective size of the tonsils.

	large	small	large	small
	%	%	%	%
Below 15 years	36	24	21	39
Total	46	54	41	59

Discussion

The clinical size of the tonsil: Is the size of tonsil on inspection of the oropharynx. In Webb's study on 195 patients, using Brodsky scale, found that patient with recurrent tonsillitis had larger tonsils^[11]. In a study on (349) children listed for tonsillectomy, Van den Akker (2003), found that (42%) of them had enlarged tonsils^[12]. In this study the incidence of enlarged tonsils was (46%), mostly in children (36%), and only (10%) in adults. This may be due to the relative size of the tonsil to that of the oropharynx, as that of the adenoid to the nasopharynx.

In children the size of the pharynx is smaller than that of the adults; hence on inspection of the oropharynx, the tonsils may give suggestion of larger size than those of the adults. Also on examination of the oropharynx using tongue depressor the gagging will approximate the tonsils to each other giving false impression of enlarged tonsils.

The objective size of the tonsil: Is the real size of the tonsil, on measurement of the volume using Archimedes's law. The incidence of hypertrophied tonsils in this study was (41%), but unfortunately I couldn't find a similar study measuring the real size of the tonsils to compare this study.

In children the incidence of hypertrophied tonsils was (36%) clinically and (24%) on measurement. This may be due to the degree of the embeddence of the tonsil in the tonsillar fossa, as they situated superficially in shallow fossa^[1,2,6,13], so appear enlarged.

In adults the incidence of hypertrophied tonsils was (10%) clinically and (20%) on measurement. This may be due to the deep embeddence of the tonsil in the tonsillar fossa^[1,2,6,13], so appear smaller on inspection of the oropharynx.

The sore throat caused by viral infections (50%), bacterial infections (20%) and in (30%) is of unclear

causes^[14]. In this study the sore throat occurred in all of the patients (100%).

Tonsillar crypts debris is an infected fibrin of whitish-yellow plugs filling the crypts of the tonsil^[9]. In a study on (349) children listed for tonsillectomy Van den Akker (2003) had found that (29%) of them had tonsillar crypts debris^[12]. In this study the tonsillar crypts debris occurred in (52%) of the patients.

Halitosis is bad taste or malodor of the breath, suggested to be due to production of volatile sulfur^[15] by several bacterial species such as *Porphyromonas gingivalis*, *Fusobacterium nucleatum* and *Treponema denticola*^[16]. In a study on (2000) patients at Tokyo medical and dental university, the prevalence of halitosis was (27.5%)^[17]. In study of Ben-Aryeh (1998) on 39 patients, (26%) of them had halitosis^[18]. In this study, halitosis had been found in (56%) of the patients.

Injections of the anterior pillar of fauces: In this study were the second most common clinical feature after the sore throat, which occurred in (86%) of the patients, which in agreement with the study of Webb (2004) on 195 patients^[11].

Enlarged cervical lymph nodes: In this study the enlarged cervical lymph nodes (jugulodigastric nodes) occurred in (72%) of the patients, particularly in children more than in adults, which is in agreement with Webb's study^[11]. Mills and Hibbert in their study on (50) children, had found that (70%) of control group had palpable cervical lymph nodes, so they conclude that presence of palpable cervical lymph nodes is not of much value in deciding whether or not a patient would benefit from tonsillectomy^[19].

In addition to the size of the tonsils, it is suggested that the frequency and severity of tonsillitis, plus tonsillar debris, cervical lymphadenopathy and anterior pillar injection should

be taken into account when deciding which patients would benefit after tonsillectomy as a treatment of chronic tonsillitis^[20].

Conclusions

- 1-The clinical size of the tonsils is of little importance as an indication for tonsillectomy in patients with chronic tonsillitis.
- 2-The clinical size of the tonsils (on inspection) is not always the real size (on measurement) of it, this may be due to:
 - a) The relative size of the tonsil and the oropharynx.
 - b) The degree to which the tonsil embedded in the tonsillar fossa.
 - c) Occurrence of the gag reflex during examination of the oropharynx using tongue depressor.

References

- 1-Snell, Richard S.; The Head and Neck Anatomy; In: Snell Anatomy; (1986); Boston/Toronto; Little; Brown and Company; Third edition; Pp. (848-849).
- 2-Beasley, P.; Anatomy of the Pharynx and Esophagus; In: Scott-Brown's Otolaryngology; (1997); edited by Michael Gleeson; London; Butter worth; Sixth edition; Vol. (1); Pp. (1/10/23-26).
- 3-Weir, N.F.; Clinical Interpretation of Tonsillar Size; Journal of Laryngology and Otolaryngology; (1972); 88; (1137-1144).
- 4-Maran, A. G. D.; The Nose, Tonsils and Adenoids; In: Logan Turner's, (Diseases of the Nose, Throat and Ear); (1988); edited by Maran, A. G. D. ; London; WRIGHT; Tenth edition; Chapter 1.1; Pp.(3-12).
- 5-Fact sheet: Tonsillectomy procedures; Tonsillectomy today; at web site of American Academy of Otolaryngology-Head & Neck surgery (www.entnet.org/HealthInformation/tonsillectomy_procedures.cfm)
- 6-Colman, Bernard H.; Adenoid and Tonsils; In: Hall and Colman; (1992); Edinburgh; Churchill Livingstone; Fourteenth edition; Pp. (95-100).
- 7-Cowan, David L. and Hibbert, John; Acute and chronic infection of the Pharynx and Tonsils; In: Scott-Brown's Otolaryngology; (1997); edited by Hibbert, John; London; Butter worth; Sixth edition; Vol. (5); Pp. (5/4/2-20).
- 8-Weingarten, Charles; Ultrasonic Tonsillectomy: Rational and Technique; Journal of Otolaryngology and Head & Neck Surgery; (February 1997); Vol. (116); No. (2); P. (196).
- 9-Tay, H.L.; Post-operative Morbidity in Electrodissection Tonsillectomy; Journal of Laryngology and otology; (March 1995); Vol. (109); P. (211).
- 10-Clarke, Peter M. ; Adenoidectomy and Tonsillectomy; In: Operative Otorhinolaryngology; (1997); edited by Nigel Bleach, Chris Milford and Andrew van Hasselt; London; Blackwell Science; First published; Pp.(295-300).
- 11-Webb, -C-J; Osman, -E; Ghosh,-S-K; Hone,-S; Tonsillar size is an important indicator of recurrent tonsillitis; Clinical otolaryngology, (2004 Aug.); 29 (4): 369-71; MIDLINE(R) on CD 2005/01-2005/03.
- 12-Van den Akker, E.H., Schilder A.G.M., Kemps Y.J.M.; Current indication for (adeno) tonsillectomy in children; International Journal of pediatric Otorhinolaryngology; (June 2003); Vol. (67); Issue (6); Pp. (603-607)
- 13-Warwick, Roger and Williams Peter L.; Development of the digestive and respiratory apparatus, In: Gray's Anatomy; (1973); London, Longman, 35th edition, Pp. (170).
- 14-Summers, Anthony; Sore throat; Journal of Accident and Emergency Nursing; (January 2005); Vol. (13); Issue (1); Pp. (15-17)
- 15-Ikawa, K.; Iwakura, M.; Washio, J.; Kusano A.; Tanda, N.; and Koseki, T.; Circadian changes of volatile sulfur compounds measured by breathtron; International congress series; (September 2005); Vol. (1284); Pp. (89-90).
- 16-Koto, H.; Yashida, A.; Awano, S.; Anso, T.; Takehara, T.; Quantitative detection of volatile sulfur compound-producing micro-organisms in oral specimens using real time PCR; Journal of oral diseases; (March 2005); Vol. (11); Supplement 1; Pp. (67-71).
- 17-Liu, X.N.; Shinada, K.; Chen, X.C.; Zhang, B.X.; Yaegaaki K.; Kawaguchi Y.; Oral malodor-related parameters in the Chinese general population; Journal of clinical periodontology; (January 2006); Vol. (33); No. (1); Pp. (31-36).
- 18-Ben-Aryeh, Hannah; (1998); Halitosis: An interdisciplinary approach; American journal of otolaryngology; (January-February 1998); Vol. (19); Issue (1); Pp. (8-11).
- 19-Mills, R.P. and Hibbert, John; The effect of recurrent tonsillitis on growth and cervical lymphadenopathy in children; In: International journal of pediatric Otorhinolaryngology; (1984); Vol. (6); Pp. (77-82).
- 20-Bailey, Byron J. and Calhoun, Karen H.; Head and Neck surgery-Otolaryngology; (1997); Lippincott-Raven; Vol. (one & two); on CD.

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