Sarcouncil Journal of Multidisciplinary

ISSN(Online): 2945-3445

Volume- 04| Issue- 05| 2024

Research Article **Received:** 05-04-2024 | **Accepted:** 21-04-2024 | **Published:** 13-05-2024

Identifying Risk Factors for Patients Who Underwent Tonsil Surgery in Iraq and Evaluating General Complications

Dr. Ali Mohammed Khalaf[1], Dr. Ali Khames Sarhan[2] and Dr. Mohammed Khalid Abdulatef[3]

[1]M.B.Ch.B., C.A.B.M.S. \ (ENT-Otolaryngology) Iraqi Ministry of Health, Al-Anbar Health Directorate, Al-Faluja Teaching Hospital, Al-Anbar, Iraq.
[2]M.B.Ch.B., F.I.C.M.S. \ (ENT-Otolaryngology) Iraqi Ministry of Health, Al-Anbar Health Directorate, Al-Faluja Teaching Hospital, Al-Anbar, Iraq.
[3]M.B.Ch.B., F.I.C.M.S. \ (ENT-Otolaryngology) Iraqi Ministry of Health, Babylon Health Directorate, Al-Esxandaria Hospital, Babylon, Iraq

Abstract: **Background**: Tonsillectomy is one of the most common surgical procedures in ENT medicine. There are many complications that can occur after tonsillectomy, although pain and bleeding are the most common. Objective: This study aimed to assess the clinical outcomes of Iraqi patients who underwent tonsil surgery and determine the common risk factors as well as general complications that affect patients. **Patients and methods**: A cross-sectional study was conducted on 75 patients who underwent tonsillectomy surgery in different hospitals in Iraq. The data collected included demographic parameters, diagnostic data, and patient information. The data set included information on individual patients with benign or malignant diseases. The perioperative form included information about the surgeon, age, sex, indication, procedure, and method. The clinical operation was divided into two procedures: cold (using steel instruments) and hot (using electrosurgical instruments). Patients who had tonsils diagnosed underwent a checkup using the Centaur Score scale, pain ratings using a numeric rating scale, and satisfaction with life using a scale from 0 to 100. The study aimed to understand the extent of symptoms and pain in patients following tonsillectomy. **Results**: Our study enrolled clinical and surgical data of patients who underwent to tonsillectomy surgery; most indicators of prevalence on the patients were difficulty swallowing included 20 cases, sore throat included 14 cases, and bad breath included 9 cases; types of tonsillitis were classified in into acute tonsillitis got 11 cases, chronic tonsillitis got 19 cases, recurrent tonsillitis got 27 cases, and peritonsillar abscess got 18 cases, type of surgery included tonsillectomy had 33 cases, tonsillectomy with adenoidectomy had 12 cases, tonsillotomy had 3 cases, tonsillotomy with adenoidectomy had 3 cases, surgical technique identified in hot with 68 cases, and cold 7 cases, duration of surgery was 54. 78 ± 6.20 min, blood loss was 10.14 ± 2.01 mL, rate of complication was 11 cases, the most common factors were infection with 4 cases and difficulty in swallowing with 3 cases, main aspects of quality of life where physical aspect was 74.20 ± 5.71 and social aspect was 78.23 ± 2.77. **Conclusion**: Tonsillectomy is a surgical procedure to remove the tonsils at the back of the throat, aiming to manage persistent inflammation and improve patient quality of life. This procedure can reduce pain and discomfort associated with tonsillitis, resulting in shorter hospital stays compared to non-surgical methods. This reduces total health expenditure for individuals and society as a whole.

Keywords: Tonsillectomy; Pain scale; Complications; Risk factors; and Symptoms

INTRODUCTION

Tonsillectomy is one of the most common surgical procedures in otorhinolaryngology. In Sweden, a country with over 10 million inhabitants, approximately 13,500 tonsillectomies are performed annually (Stalfors, J. *et al.*, 2012). In England and Wales, the number of tonsillectomies performed in 2005 was approximately 50,000. Despite the large number of surgical cases, relatively few published studies have assessed the impact of tonsillectomy on health and quality of life (Borgström, A. *et al.*, 2017; De Luca Canto, G. *et al.*, 2015). The two most common indications for tonsillectomy are sleep-disordered breathing and infection-related problems (Seshamani, M., *et al.*, 2014).

In Sweden, both tonsillectomy (TE) and tonsillotomy (TT) are performed. Tonsillectomy is the complete removal of the tonsils, while tonsillotomy is also known as partial removal of the tonsils (Johnson, L. B., Elluru, R. G., & Myer III, C. M. 2002). Postoperative complications of tonsil surgery include pain and haemorrhage, with significant morbidity being linked to this procedure (Windfuhr, J. P., *et al.*, 2016). A limited number of studies have been conducted on late postoperative complications (Stalfors, J., *et al.*, 2012). However, a substantial body of literature exists on early postoperative complications, which are defined as occurring within the first weeks after surgery (Pynnonen, M., *et al.*, 2017). These complications are referred to as early postoperative complications (Odhagen, E., *et al.*, 2019; Windfuhr, J. P., *et al.*,2016; De Luca Canto, G., *et al.*, 2015).

In contrast, complications that persist after the initial postoperative period are known as long-term complications (Söderman, A. C. H., *et al.*,2015; Johnson, L. B., Elluru, R. G., & Myer III, C. M. 2002; Pynnonen, M., Brinkmeier, J. V., *et al.*, 2017). However, there is a paucity of information on this subject. The majority of publications are based on a limited number of patients, with the

Copyright © 2021 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

***Corresponding Author:** Dr. Ali Mohammed Khalaf

DOI- tps://doi.org/10.5281/zenodo.11187400

studies often focusing on a single case series from a single centre.(Leong, S. C., *et al.*,200).

The literature contains references to issues with taste disorders and cases where patients have complained about the difficulty in closing off nasal passages behind the base/back part (i.e., back) of their mouth (Windfuhr, J. P., *et al.*, 2010). Additionally, there have been accounts given of cases where people have developed thickening around their tendons, which has been referred to as Eagle's Syndrome due to the appearance of wings under the skin (Odhagen, E., *et al.*, 2019; Lundström, F.,*et al.*,2020; Soldatova, L., & Doty, R. L. 2018). The methodology employed in the study may have resulted in an underreporting of the actual types and rates of complications (Perkins, J. N., *et al.*, 2012). Several investigations into the potential long-term complications post-tonsillectomy have been conducted, yet the authors have no key data obtained from research involving large populations on this subject (Alm, F., Lundeberg, S., & Ericsson, E. 2021).

In the Swedish Tonsil Register, over 100,000 tonsil surgeries have been recorded by 2020. Over the past ten years, approximately 80% of all tonsil surgeries in Sweden have been included in the register (Ersözlü, T., Yıldırım, Y. S., & Sarica, S. 2013). All patients registered with the SQTS are expected to complete a questionnaire within six months of their surgery, focusing on the outcome of the procedure and any new problems that may have arisen. The most common indications for this procedure are recurrent or chronic tonsillitis, obstructive sleep apnoea, and colonisation by streptococci. When other medical methods have proven to be ineffective, patients usually undergo surgery (Elinder, K., *et al*., 2016). In 2000, the American Academy of Otolaryngology issued clinical indicators set for patient selection for tonsillectomy. The presence of three or more episodes of tonsillitis and adenoiditis in a single year, despite the administration of appropriate medical therapy, would be regarded as a compelling indication for surgical intervention (Tomkinson, A., *et al.*, 2011).

PATIENTS AND METHODS

Study design

A cross-sectional study was conducted on patients who had undergone tonsillectomy surgery. The study included 75 patients with ages ranged between (5 and 20) years, which were selected from clinical records in different hospitals in Iraq. The data collected included both demographic parameters (age, gender, symptoms, concomitant diseases, and others) and diagnostic data (causes and types of disease). The degree of spread and pain before surgery, the techniques used in the procedures, the infections that the patients underwent, the surgical time (time of surgery, negative factors during surgery, the bleeding rate, the length of stay in the hospital, the rate of complications that patients experienced during the follow-up period that lasted for seven months, and risk factors were all considered.

The data source and definition of long-term complications

The data set comprises information on individual patients who have undergone tonsillectomies for benign or malignant causes. It excludes elderly patients who had previously undergone surgery or were taking particular medications, while patients suffering from either benign or malignant diseases form part of the study population. This model provides a detailed description of the registry structure, including variables and indicators, as well as instructions on how to obtain data from hospital files. The perioperative form contains information about the surgeon, including age, sex, indication (obstruction or infection), procedure (TE or TT without or with stromal surgery), and method and surgical procedure, which are completed by surgeons during surgery. The clinical operation was divided into two distinct procedures. The "cold" procedure involved the use of steel instruments, whereas the "hot" procedure referred to the use of electrosurgical instruments for surgery.

Population Study

The study included all patients registered at the hospital between February 4, 2022, and August 29, 2023, who returned the 7-month follow-up questionnaire.

Data Assessment

A questionnaire was administered to patients who had undergone tonsil surgery. Each patient who had their tonsils diagnosed underwent a checkup to determine the extent of their symptoms. This was done using a scale commonly used in determining the severity of tonsillitis in patients, which includes the Centaur Score. The score may range from 0 to 4, depending on the presence or absence of specific symptoms. Additionally, patients' pain ratings following tonsillectomy were evaluated using a numeric rating scale (NRS). This scale typically encompasses values from 0, indicating the absence of pain, to 10, representing the maximum pain intensity. Additionally, patients

Copyright © 2021 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

who had their tonsils removed were surveyed regarding their satisfaction with life using a scale from 0 to 100, with 0 representing a severely impaired quality of life and 100 indicating optimal physical, mental, emotional, and general daily performance.

RESULTS

Table 1: Demographic and preoperative characteristics observed in this study.

Characteristics	Frequency [n = 75]	Percentage [%]
Age		
5 – 9	12	16%
10 – 14	27	36%
15 – 20	36	48%
Sex		
Male	33	44%
Female	42	56%
BMI, Kg/m2		
Underweight	5	6.67%
Normal weight	33	44.00%
Overweight	23	30.67%
Obesity	14	18.67%
Main indications		
Snoring	7	9.33%
Sore throat	14	18.67%
Difficulty swallowing	20	26.67%
Upper airway obstruction	6	8.00%
Ear pain	2	2.67%
Bad breath	9	12.00%
White or yellow coating on the tongue	3	4.00%
Fever	6	8.00%
Swollen uvula	2	2.67%
Neck pain	6	8.00%
Comorbidities		
Yes	23	30.67%
No	52	69.33%
Hypertension	15	20.0%
Diabetes	5	6.67%
Asthma	9	12.00%
Obesity	16	21.33%
Kidney diseases	4	5.33%
Cardiovascular disease	2	2.67%
Depression and anxiety	8	10.67%
Family history		
Yes	12	16.00%
No	63	84.00%
Smoking status		
Yes	15	20%
No	60	80%

Copyright © 2021 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

Table 2: Determine diagnoses data of patients who undergone to tonsillectomy.

Characteristics	**Frequency [n = 75]**	**Percentage [%]**
Types of tonsillitis		
Acute tonsillitis	11	14.67%
Chronic tonsillitis	19	25.33%
Recurrent tonsillitis	27	36.00%
Peritonsillar abscess	18	24.00%
Past treatments for tonsil-related issues		
Yes	15	20.00%
No	60	80.00%
Infections		
Bacterial	63	84%
Viral	12	16%
Imaging tests		
CT scan	67	89.33%
MRI	52	69.33%
Severity of tonsillitis		
< 2	10	13.33%
≥ 2	65	86.67%

Table 3: Identify surgical data of patients who undergone to tonsillectomy.

Surgical data	**Frequency [n = 75]**	**Percentage [%]**
Type of surgery, N (%)		
Tonsillectomy	33	44.00%
Tonsillectomy with adenoidectomy	12	16.00%
Tonsillotomy	3	4.00%
Tonsillotomy with adenoidectomy	27	36.00%
Surgical technique		
Cold	7	9.33%
Hot	68	90.67%
Duration of surgery, min, (Mean ± SD)	54.78 ± 6.20	
Anesthesia used, N (%)		
General (GA)	75	100%
Blood loss, mL	10.14 ± 2.01	
Bleeding, (N%)		
Yes	4	5.33%
No	71	94.67%
Vital signs		
Blood pressure, mmHg, (Mean ± SD)		
Systolic	112.45 ± 4.67	
Diastolic	76.74 ± 2.53	
Heart rate, (Mean ± SD)	75.25 ± 8.35	
Oxygen saturation (Mean ± SD)	(95% – 99%)	
ICU admission, N (%)		
Yes	4	5.33%
No	71	94.67%
Length of stay in hospital, days, (Mean ± SD)	2.02 ± 0.14	
Mortality rate		
Yes	0	0%
No	75	100%

Copyright © 2021 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

Table 4: Postoperative complications.

Characteristics	Frequency [n = 75]	Percentage [%]
Bleeding	1	1.33%
Infection	4	5.33%
Dehydration	1	1.33%
Pain	1	1.33%
Difficulty swallowing	3	4.00%
Bad breath	0	0.00%
Changes in taste or voice	1	1.33%
Total	11	14.67%

Table 5: Assessment of pain scores into patients after tonsillectomy surgery using a numeric rating scale.

Follow–up time, months.	Numeric rating scale
1st month	5.43 ± 0.42
2nd month	4.47 ± 0.78
3rd month	3.89 ± 1.02
4th month	2.56 ± 0.22
6th month	1.01 ± 0.06
7th month	0.92 ± 0.004

Table 6: Assessment of quality of life into patients after tonsillectomy surgery.

Follow–up time, months.	QoL scale
Physical aspect	74.20 ± 5.71
Psychological aspect	68.46 ± 6.25
Social aspect	78.23 ± 2.77
Daily activity	70.10 ± 3.90

Table 7: A univariable predictor of pain or discomfort in the mouth or throat following a tonsillectomy.

Variables	OR	CI 95%
Females	3.2	0.4 – 6.6
Surgical techniques	2.6	0.3 – 4.7
Age at surgery	5.2	1.1 – 8.9
Infections	1.8	0.8 – 2.4
Bleeding	2.7	1.6 – 4.1
Difficulty swallowing	3.5	1.1 – 5.4
Pain	4.6	2.9 – 6.1

DISCUSSION

According to clinical and demographic results of patients who underwent tonsillectomy surgery, our results showed that patients with age (15 - 20) years were the highest with 48%, followed by patients with age (10 - 14) years were 36%, females included the greatest with 42 cases as more than males with 33 cases, BMI classified into four parts, which consists of underweight got 5 cases, Normal weight had 33 cases, overweight was 23 cases, and obesity was 14 cases, most indicators prevalence on the patients were difficulty swallowing included 20 cases, sore throat included 14 cases, and bad breath included 9 cases, rate of comorbidities was 23 cases, where main diseases shown were obesity with 16 cases, and hypertension with 15 cases, smokers were 20%, and family history was 16%.

In determining the diagnosis findings, the results enrolled diagnosis data, where found types of tonsillitis were classified into acute tonsillitis got 11 cases; chronic tonsillitis got 19 cases; recurrent tonsillitis got 27 cases; and peritonsillar abscess got 18 cases, rate of patients who had undergone past treatments for tonsil-related problems was 15 cases, infections included bacterial included 63 cases and viral included 12 cases, imaging tests consists of CT scan had 67 cases and MRI had 52 cases, as well as severity of tonsillitis less than two was 13. 33%, and the severity of tonsillitis more than or equal to 2 was 86.67%.

According to the results of tonsillectomy surgery, we recorded surgical findings; the type of surgery included tonsillectomy had 33 cases, tonsillectomy with adenoidectomy had 12 cases, tonsillotomy had 3 cases, tonsillotomy with adenoidectomy had

Copyright © 2021 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

3 cases, surgical technique identified in hot with 68 cases, and cold 7 cases, duration of surgery was 54. 78 ± 6.20 min, blood loss was 10.14 ± 2.01 mL, rate of patients who had bleeding included 4 cases, blood pressure included systolic was 112. 45 ± 4.67 mmHg and diastolic 76.74 ± 2.53 mmHg, heart rate was 75.25 ± 8.35, oxygen saturation was (95% - 99%), ICU admission was 4 cases, length of stay in hospital was 2.02 ± 0.14 days, mortality rate was 0. Also, we recorded complications that prevelance in patients, where the rate of complication was 11 cases; the most common factors were infection with 4 cases and difficulty in swallowing with 3 cases. In addition, we conducted an assessment of pain and quality of life for patients after surgery, where pain scores were 5.43 ± 0.42 in the first month and 0.92 ± 0.004 in seven months, the main aspects of quality of life where the physical aspect was 74.20 ± 5.71, and the social aspect was 78.23 ± 2.77.

According to previous research, hot surgeries will likely raise the probability of postoperative bleeding after tonsillectomy, presumably as shown in some of the studies (Lowe, D., *et al.,* 2007; Sarny, S., 2011). In other studies, there had been mention of taste disorders as one of the complications which may occur after tonsillectomy (Byars, S. G., *et al.*, 2018). Injury to the lingual or tonsillar branches of the glossopharyngeal nerve resulting from ligation, stretching of the nerve, or scarring during healing could cause postoperative taste disorders (Rosenfeld, R. M. *et al.*, 2018). It has been suggested that high-technology equipment predisposes post-TE taste disorders; hence, use should be minimized (Byars, S. G., *et al.*, 2018). Conversely, an American study does not indicate that there is a link between the utilization of hot methods for attaining hemostasis in post-operation taste disturbances. Taste disturbances and dysphagia, while unusual in the long run after tonsillectomy, may cause considerable suffering among a few patients (Lüscher, M., Thrane, J. F., & Homøe, P. *et al.*,2018). For instance, advanced age at operation has already been identified as a major risk factor for immediate complications, including but not limited to post-tonsillectomy hemorrhage and pain. Having been around for a long time is a different risk factor for the person in the analysis using more than one variable (Hirst, A., *et al.*, 2019).

CONCLUSION

Surgical removal of the tonsils, located at the back of the throat, is known as tonsillectomy. The primary objective of undergoing a tonsillectomy operation is to manage persistent or recurrent inflammation of the tonsils, which may cause difficulties in swallowing or sleeping, among other symptoms such as halitosis. This procedure can significantly reduce the pain and discomfort that are usually associated with these conditions, thereby improving the quality of life for patients. Furthermore, removing the tonsils may result in shorter hospital stays after having undergone tonsillitis surgeries compared to non-surgical methods used in treating diseases related to tonsils, thereby reducing the total health expenditure made by individuals and society at large.

REFERENCES

1. Stalfors, J., Ericsson, E., Hemlin, C., Hultcrantz, E., Roos, K., Sunnergren, O. "The National Tonsil Surgery Register in Sweden." *Otolaryngology–Head and Neck Surgery* 147.S2 (2012): P237-P238.
2. Borgström, A., Nerfeldt, P., Friberg, D., Sunnergren, O., & Stalfors, J. "Trends and changes in paediatric tonsil surgery in Sweden 1987–2013: a population-based cohort study." *BMJ open* 7.1 (2017): e013346.
3. Mitchell, R. B., Archer, S. M., Ishman, S. L., Rosenfeld, R. M., Coles, S., Finestone, S. A., ... & Nnacheta, L. C. "Clinical practice guideline: tonsillectomy in children (update)." *Otolaryngology–Head and Neck Surgery* 160.1_suppl (2019): S1-S42.
4. De Luca Canto, G., Pachêco-Pereira, C., Aydinoz, S., Bhattacharjee, R., Tan, H. L., Kheirandish-Gozal, L., ... & Gozal, D. "Adenotonsillectomy complications: a meta-analysis." *Pediatrics* 136.4 (2015): 702-718.
5. Seshamani, M., Vogtmann, E., Gatwood, J., Gibson, T. B., & Scanlon, D. "Prevalence of complications from adult tonsillectomy and impact on health care expenditures." *Otolaryngology--Head and Neck Surgery* 150.4 (2014): 574-581.
6. Johnson, L. B., Elluru, R. G., & Myer III, C. M. "Complications of adenotonsillectomy." *The laryngoscope* 112.S100 (2002): 35-36.
7. Windfuhr, J. P., Toepfner, N., Steffen, G., Waldfahrer, F., & Berner, R. "Clinical practice guideline: tonsillitis II. Surgical management." *European Archives of Oto-Rhino-Laryngology* 273 (2016): 989-1009.
8. Stalfors, J., Ericsson, E., Hemlin, C., Hultcrantz, E., Roos, K., Sunnergren, O., & Hessen-Söderman, L. "The National Tonsil Surgery Register in

Copyright © 2021 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

Sweden." *Otolaryngology–Head and Neck Surgery* 147.S2 (2012): P237-P238.
9. Pynnonen, M., Brinkmeier, J. V., Thorne, M. C., Chong, L. Y., & Burton, M. J. "Coblation versus other surgical techniques for tonsillectomy." *Cochrane database of systematic reviews* 8 (2017).
10. Odhagen, E., Stalfors, J., & Sunnergren, O. "Morbidity after pediatric tonsillotomy versus tonsillectomy: a population-based cohort study." *The Laryngoscope* 129.11 (2019): 2619-2626
11. Söderman, A. C. H., Odhagen, E., Ericsson, E., Hemlin, C., Hultcrantz, E., Sunnergren, O., & Stalfors, J. "Post-tonsillectomy haemorrhage rates are related to technique for dissection and for haemostasis. An analysis of 15734 patients in the National Tonsil Surgery Register in Sweden." *Clinical Otolaryngology* 40.3 (2015): 248-254.
12. Lundström, F., Stalfors, J., Østvoll, E., & Sunnergren, O"Practice, complications and outcome in Swedish tonsil surgery 2009–2018. An observational longitudinal national cohort study." *Acta oto-laryngologica* 140.7 (2020): 589-596.
13. Leong, S. C., Karkos, P. D., Papouliakos, S. M., & Apostolidou, M. T. "Unusual complications of tonsillectomy: a systematic review." *American journal of otolaryngology* 28.6 (2007): 419-422.
14. Windfuhr, J. P., Sack, F., Sesterhenn, A. M., Landis, B. N., & Chen, Y. S. "Post-tonsillectomy taste disorders." *European archives of oto-rhino-laryngology* 267 (2010): 289-293.
15. Soldatova, L., & Doty, R. L. "Post-tonsillectomy taste dysfunction: Myth or reality?." *World journal of otorhinolaryngology-head and neck surgery* 4.1 (2018): 77-83.
16. Perkins, J. N., Liang, C., Gao, D., Shultz, L., & Friedman, N. R. "Risk of post-tonsillectomy hemorrhage by clinical diagnosis." *The Laryngoscope* 122.10 (2012): 2311-2315.
17. Alm, F., Lundeberg, S., & Ericsson, E. "Postoperative pain, pain management, and recovery at home after pediatric tonsil surgery." *European Archives of Oto-Rhino-Laryngology* 278 (2021): 451-461.
18. Ersözlü, T., Yıldırım, Y. S., & Sarica, S. "Comparison of pediatric and adult tonsillectomies performed by thermal welding system." *International Journal of Otolaryngology* 2013 (2013).
19. Elinder, K., Söderman, A. C. H., Stalfors, J., & Knutsson, J. "Factors influencing morbidity after paediatric tonsillectomy: a study of 18,712 patients in the National Tonsil Surgery Register in Sweden." *European Archives of Oto-Rhino-Laryngology* 273 (2016): 2249-2256.
20. Tomkinson, A., Harrison, W., Owens, D., Harris, S., McClure, V., & Temple, M. "Risk factors for postoperative hemorrhage following tonsillectomy." *The Laryngoscope* 121.2 (2011): 279-288.
21. Lowe, D., van der Meulen, J., Cromwell, D., Lewsey, J., Copley, L., Browne, J., ... & Brown, P. "Key messages from the national prospective tonsillectomy audit." *The Laryngoscope* 117.4 (2007): 717-724.
22. Sarny, S., Ossimitz, G., Habermann, W., & Stammberger, H. "Hemorrhage following tonsil surgery: a multicenter prospective study." *The Laryngoscope* 121.12 (2011): 2553-2560.
23. Byars, S. G., Stearns, S. C., & Boomsma, J. J. "Association of long-term risk of respiratory, allergic, and infectious diseases with removal of adenoids and tonsils in childhood." *JAMA Otolaryngology–Head & Neck Surgery* 144.7 (2018): 594-603.
24. Rosenfeld, R. M. "Old barbers, young doctors, and tonsillectomy." *JAMA Otolaryngology–Head & Neck Surgery* 144.7 (2018): 603-604.
25. Byars, S. G., Stearns, S. C., & Boomsma, J. J. "Limitations to the Association of Risk of Airway Disease With Removal of Adenoids and Tonsils in Children—Reply." *JAMA Otolaryngology–Head & Neck Surgery* 144.12 (2018): 1188-1189.
26. Lüscher, M., Thrane, J. F., & Homøe, P. "Limitations to the association of risk of airway disease with removal of adenoids and tonsils in children." *JAMA Otolaryngology–Head & Neck Surgery* 144.12 (2018): 1188-1188.
27. Hirst, A., Philippou, Y., Blazeby, J., Campbell, B., Campbell, M., Feinberg, J., ... & McCulloch, P. "No surgical innovation without evaluation: evolution and further development of the IDEAL framework and recommendations." *Annals of surgery* 269.2 (2019): 211-22 oi: 10.1097/sla.0000000000002794

Copyright © 2021 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:
Khalaf, A.M., Sarhan, A.K. and Abdulatef, M.K. "Identifying Risk Factors for Patients Who Underwent Tonsil Surgery in Iraq and Evaluating General Complications." *Sarcouncil Journal of Multidisciplinary 4.5* (2024): pp 1-7

Copyright © 2021 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher