

Feasibility of targeted tonsillectomy histology in Southeast Asia: A review of 4115 paediatric tonsillectomies

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Dear Editor,

Tonsillectomy is commonly performed in paediatric patients to treat adenotonsillar hypertrophy and related symptoms, or chronic or recurrent tonsillitis.¹ In Singapore's KK Women's and Children's Hospital (KKH—the country's largest public hospital specialising in healthcare for women and children—all tonsillectomy specimens undergo histological examination, constituting 16% of the paediatric histopathology case-load. Opinions vary on whether all routine tonsillectomy specimens must undergo histological examination.

Recent studies show that tonsillar malignancies are rare and present with distinctive clinical features, such as tonsillar asymmetry and cervical lymphadenopathy.^{2,3} Some centres therefore limit histological examination to cases with high-risk clinical features (targeted tonsil histopathology). Proponents argue that this conserves healthcare resources while not missing critical diagnoses such as malignancies.³ This approach has been adopted in guidelines from the Royal College of Pathologists.⁴ Conversely, a study in a tuberculosis-endemic region described incidental detection of active tuberculosis through routine histopathological tonsil examination, arguing in support of examining all tonsils histologically.⁵ Most studies supporting targeted tonsil histopathology were performed in the US, with no large-cohort studies in Southeast Asia.⁶ The authors sought to assess the feasibility of targeted tonsil histopathology in a population through a retrospective review of tonsillectomy specimens at KKH.

All tonsillectomy pathology reports from 2015 to 2024 for patients under 21 years old who underwent tonsillectomy in KKH were retrospectively reviewed. Clinical indications were obtained from pathology request forms. Where necessary, electronic patient records were reviewed to ascertain clinical indications or clinical impact of pathologic findings. In accordance with SingHealth Centralised Institutional Review Board, department and institution representatives endorsed

this study as a service improvement project, not requiring review by institutional review board.

There were 4115 tonsillectomy cases, comprising 8176 individual tonsils. Patients' age ranged from 10 months to 20 years (median 7.00 years); 63.4% were male. The majority (3882, 94.3%) presented with tonsillar hypertrophy, sleep-disordered breathing, and/or recurrent tonsillitis, without the presence of tonsillar asymmetry, lymphadenopathy, or any other worrisome clinical features. Clinical tonsillar asymmetry and/or lymphadenopathy was present in 163 cases (3.96%), including 153 with only tonsillar asymmetry, 7 with only lymphadenopathy, and 3 with both. Other clinical presentations are outlined in Table 1. Histopathology revealed only reactive lymphoid hyperplasia in 4065 cases (98.8%). Malignant diagnoses comprised Burkitt lymphoma in 2 cases (0.05%). Other diagnoses included non-necrotising granulomatous inflammation (7, 0.17%), necrotising granulomatous inflammation (2, 0.05%), features reminiscent of Rosai-Dorfman disease (RDD) (3, 0.07%), and rare atypical squamous cells (1, 0.02%). Remaining diagnoses are outlined in Table 1. Specimens with granulomatous inflammation did not show fungal organisms or acid-fast bacilli on special stains.

Tonsillar malignancies invariably presented with lymphadenopathy or tonsillar asymmetry, both of which would have prompted histopathological examination under a targeted approach, consistent with previous reports.^{2,3} Of the 2 patients with Burkitt lymphoma, 1 patient presented with massive cervical lymphadenopathy, leading to overt clinical suspicion of malignancy. The other patient presented with upper respiratory tract symptoms, snoring, and mouth breathing. Clinical examination showed asymmetric tonsillar enlargement documented as grade 5+ right tonsil enlargement, crossing the midline, and grade 1 left tonsil enlargement. Tonsillectomy was performed to treat snoring and exclude lymphoma. Gross examination of the right tonsil showed soft to fleshy,

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Table 1. Characteristics of patients undergoing tonsillectomy.

Clinical presentation	no. (%)
Tonsillar hypertrophy (including snoring, obstructive sleep apnoea) and/or recurrent tonsillitis, with no other worrisome clinical features	3882 (94.34)
Asymmetry and/or lymphadenopathy	163 (3.96)
Otitis media with effusion	31 (0.75)
Peritonsillar cellulitis/abscess	13 (0.32)
Oropharyngeal mass lesion	11 (0.27)
Para/retropharyngeal abscess	5 (0.12)
Tonsillolith	3 (0.07)
Rosai-Dorfman disease	1 (0.02)
CHARGE syndrome	1 (0.02)
Excision of right branchial fistula	1 (0.02)
Chronic sinusitis	1 (0.02)
Raised Epstein-Barr virus antibody titres	1 (0.02)
Recurrent tonsillitis and infections on a background of previous leukaemia	1 (0.02)
Halitosis	1 (0.02)
Pathologic findings	
Reactive lymphoid hyperplasia only	4065 (98.78)
Abscess/microabscess	13 (0.32)
Acute +/- chronic inflammation	8 (0.19)
Granulomatous inflammation (non-necrotising)	7 (0.17)
Benign cyst	5 (0.12)
Histologic features similar to Rosai-Dorfman disease	3 (0.07)
Burkitt lymphoma	2 (0.05)
Granulomatous inflammation (necrotising)	2 (0.05)
Other reactive process	2 (0.05)
Organism	2 (0.05)
Rare atypical squamous cells	1 (0.02)
Choristoma	1 (0.02)
Squamous papilloma	1 (0.02)
Lymphangiomatous polyp	1 (0.02)
Fibroepithelial polyp	1 (0.02)
Lymphoid papillary hyperplasia	1 (0.02)
Total	4115 (100)

CHARGE: coloboma, heart defects, atresia of the choanae, retarded growth and development, genital abnormalities, and ear abnormalities
 In bold, the 2 most important diagnostic categories in this study's findings.

white nodular cut surfaces. Both patients were treated with chemotherapy, achieving remission. Given the worrisome clinical findings in the second case, there was no necessity to rely on an abnormal gross appearance of the specimen for the second case to raise suspicion of malignancy, suggesting that gross examination of all resected tonsils in the laboratory is unnecessary, as argued by others.³ No studies reported cases where detection of malignancy depended solely upon abnormal gross pathologic findings without suggestive clinical features.

Tonsillar granulomas were not associated with any particular clinical presentation or sinister pathology. Patients with non-necrotising granulomas were followed up routinely, and no additional clinical aetiologies were diagnosed. One of 2 patients with necrotising granulomatous inflammation defaulted follow-up and was clinically well 2 years later. The other patient's tonsils showed *Actinomyces* organisms and granulomas extending to connective tissue and skeletal muscle at the deep margin. Polymerase chain reaction was negative for tuberculosis. The patient was treated for *Actinomyces* infection with 3 months of antibiotics and remained well. Observation was offered as an alternative management strategy because *Actinomyces* infection is usually slowly progressive and clinically evident,⁷ giving ample opportunity for treatment. Omitting tonsil examination would not have had major implications if there had been adequate follow-up and return advice. Incidental histological detection of *Actinomyces* in tonsils is otherwise insignificant as the organism is part of the physiologic tonsil flora.⁸

The incidence of tonsillar granulomas in this study (9, 0.22%) is similar to that in other cohorts. Lack of tonsillar tuberculosis despite tuberculosis endemicity could be related to Singapore's comprehensive national tuberculosis programme. Absence of sarcoidosis is unsurprising given its low incidence in Singapore.⁹ Tonsillar granulomas in this study's population could be an exaggerated response to chronic tonsillitis, as postulated by other authors,¹⁰ or idiopathic.

Patients whose tonsils showed RDD-like features presented with tonsillar hypertrophy-related symptoms without the massive lymphadenopathy seen in typical RDD. Histopathology showed large, S100-immunoreactive histiocytes with ample cytoplasm and emperipolesis. The patients remained well with no clinical RDD. No other studies reported such histologic findings, which might not represent bona fide RDD. Incidental detection of such features is clinically insignificant in any case, as resected unifocal RDD can be observed.¹¹

The patient whose tonsil showed rare, atypical squamous cells presented only with snoring and

tonsillar hypertrophy. Histological examination showed a few keratinocytes with irregular nuclear membranes but normal chromatin, limited to 1 high-power field, far from the resection margin. This was interpreted as virus-induced or reactive to inflammation. The patient was well 11 months after surgery with no clinical abnormality, indicating that the histological finding was of no clinical significance.

In conclusion, tonsils removed from patients with only tonsillar hypertrophy, sleep-disordered breathing, or tonsillitis are invariably benign with no clinically significant pathologic findings, representing 94.3% of all tonsillectomy cases. Histological examination could be safely limited to cases with tonsillar asymmetry, lymphadenopathy, and/or other unusual or concerning clinical features, which would conserve use of finite healthcare resources in an age of increasing demand for molecular pathology and digital computational methods.

Ethics statement

In accordance with SingHealth Centralised Institutional Review Board, department and institution representatives endorsed this as a service improvement project, not requiring Institutional Review Board review.

Declaration

The authors declare there are no affiliations with or involvement in any organisation or entity with any financial interest in the subject matter or materials discussed in this manuscript.

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REFERENCES

1. Randall DA. Current Indications for Tonsillectomy and Adenoidectomy. *The J Am Board Fam Med* 2020;33:1025-30.
2. Sayed K, Van Savell H, Hutchison RE, et al. Review of tonsillar lymphoma in pediatric patients from the pediatric oncology group: What can be learned about some indications for microscopic examination? *Pediatr Dev Pathol* 2005;8:533-40.
3. Bizzell JG, Richter GT, Bower CM, et al. Routine pathologic examination of tonsillectomy specimens: A 10-year experience at a tertiary care children's hospital. *Int J Pediatr Otorhinolaryngol* 2017;102:86-9.
4. Liebmann R, Varma M. Best practice recommendations: Histopathology and cytopathology of limited or no clinical value. *The*

- Royal College of Pathologists. October 2019. <https://www.rcpath.org/static/6516e9e7-4a23-4839-a8537c40c882a3b9/cbc1d100-3372-482d-a34268bafa829100/G177-BPR-histopathology-and-cytopathology-limited-or-no-clinical-value.pdf>. Accessed 26 July 2025.
5. Mestry V, Sardesai RB, Sonawale S, et al. Routine Histopathology of Tonsillectomy Specimens, Is It Necessary? A Prospective Observational Study. *Indian J Otolaryngol Head Neck Surg* 2024;76:4468-78.
6. Mohamad I, Hassan S, Salim R. The Routine Histopathological Examination of Tonsillectomy Specimens at Hospital Universiti Sains Malaysia – Retrospective Study and Its Implication. *Malays J Med Sci* 2007;14:53-5.
7. Moturi K, Kaila V. Cervicofacial Actinomycosis and its Management. *Ann Maxillofac Surg* 2018;8:361-4.
8. Zięba N, Miśkiewicz-Orczyk K, Misiołek M, et al. The Clinical Significance of Tonsillar Actinomyces in Histopathological Samples after Tonsillectomy. *Pathogens* 2023;12:1384.
9. Anantham D, Ong SJ, Chuah KL, et al. Sarcoidosis in Singapore: Epidemiology, clinical presentation and ethnic differences. *Respirology* 2007;12:355-60.
10. Kardon DE, Thompson LDR. A Clinicopathologic Series of 22 Cases of Tonsillar Granulomas. *Laryngoscope* 2000;110:476-81.
11. Abal O, Jacobsen E, Picarsic J, et al. Consensus recommendations for the diagnosis and clinical management of Rosai-Dorfman-DeStombes disease. *Blood* 2018;131:2877-90.