EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Coden USA: EJBPBO
Volume: 13
Issue: 8
Year: 2026

PREVALENCE AND DIAGNOSTIC PERFORMANCE OF PREOPERATIVE EVALUATION IN PEDIATRIC PATIENTS UNDERGOING SISTRUNK PROCEDURE FOR THYROGLOSSAL DUCT CYST

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DOI: https://doi.org/10.5281/zenodo.21702867

How to cite this Article: Osama Salim AL-Fanek*, Ra'ad Deifallah Al Daboubi, Heba Ghaleb Dboush, Khaled Ahmad Qattash, Mohammad Harbi Odat, Banan Muhammad Malallah. (2026). Prevalence And Diagnostic Performance Of Preoperative Evaluation In Pediatric Patients Undergoing Sistrunk Procedure For Thyroglossal Duct Cyst. European Journal of Biomedical and Pharmaceutical Sciences, 13(8), 163–171.

Article Received on 28/06/2026 **Article Revised on 18/07/2026** **Article Published on 01/08/2026**

ABSTRACT

Background: Thyroglossal duct cyst (TGDC) is the most common congenital midline neck lesion arising from persistence of the thyroglossal duct. The standard treatment is the Sistrunk procedure. Accurate preoperative diagnosis is essential for surgical planning and prevention of recurrence, yet the diagnostic performance of ultrasound combined with clinical and laboratory findings relative to histopathological confirmation remains incompletely characterized. **Aims:** To determine the prevalence of histopathologically confirmed TGDC among pediatric patients undergoing Sistrunk procedure at Queen Rania Al Abdullah Hospital for Children, Royal Medical Services, Amman, Jordan between January 2023 and January 2026. And to evaluate the diagnostic performance of preoperative ultrasound combined with thyroid function tests, compared with postoperative histopathology. **Methods:** This retrospective observational study included patients who underwent Sistrunk procedure for suspected TGDC at a Royal Medical Services hospital. Demographic, clinical, imaging, laboratory, and histopathological data were extracted from medical records. Prevalence was calculated, and diagnostic accuracy metrics (sensitivity, specificity, positive and negative predictive values) were assessed using histopathology as the reference standard **Results:** Totally 312 children were analyzed with an average age of 6.36 ± 3.32 years. Of those, 237 cases had TGDC pathology with confirmation rates reaching 76.0% (95% CI 70.9%–80.4%). Other possible conditions included dermoid/epidermoid cyst, reactive lymph nodes, branchial abnormalities, lymphatic malformation, among others. Preoperatively, ultrasound showed sensitivity of 0.87, specificity of 0.73, positive predictive value of 0.91, and negative predictive value of 0.64. Composite preoperative diagnostic process increased sensitivity up to 0.94 and negative predictive value to 0.76, whereas specificity dropped down to 0.59. In the multivariate model, bigger cyst diameter and positive preoperative ultrasound significantly increased histopathologic confirmation, while history of neck operation significantly decreased it. **Conclusion:** Within this group of children requiring surgery, about 75% had TGDC, as confirmed through histopathology after the performance of the Sistrunk operation for suspected TGDC. The preoperative ultrasound had excellent sensitivity and positive predictive value, reinforcing its use as the primary diagnostic test. Combination of preoperative testing led to an improvement in sensitivity while decreasing specificity. This study reflects a surgically selected cohort of children undergoing Sistrunk procedure, and therefore diagnostic performance measures may not represent unselected patients with pediatric neck masses.

KEYWORDS: Thyroglossal duct cyst, diagnostic accuracy, Sistrunk procedure, preoperative imaging.

INTRODUCTION

The thyroid gland is the first gland to form in the body during the third week of pregnancy. It is a butterfly-shaped, tiny gland positioned in front of the neck with significant functions, primarily sending hormones to various organs in the body.[1] Thyroid gland lies inferior to sternohyoid and sternothyroid muscles and inferior to thyroid cartilage from C5 to T1 vertebrae. Endoderm of

pharyngeal pouches give rise to this gland.[2] Its primary function as an important endocrine organ of the body is to manage serum calcium levels, growth and metabolism by producing calcitonin and thyroid hormone.[3] Thyroid develops near the base of the tongue between the 1st and 2nd pharyngeal pouches. Migration of thyroid diverticulum is around the fifth week of gestation. The connection between the thyroid gland and tongue is made by thyroglossal duct (TGD).[4] TGD is a congenital defect caused by a residual portion of the thyroid gland in the neck as it descends from the foramen cecum to trachea anteriorly. A persistent TGD will result in common anomaly called thyroglossal duct cyst (TGDC).[5] TGDC is the most frequently formed cervical anomaly, affecting 7% of the population. These cysts are usually masses in the midline of the neck in proximity to hyoid bone, typically presenting as painless, moves with swallowing or protrusion of tongue in kids under 10 years old.[6] TGDC is usually diagnosed through noninvasive methods such as ultrasound. Moreover, thyroid gland scintigraphy is also an essential imaging tool among ultrasound.[7]

Definitive treatment is surgery which reduces recurrence rates and protect against infections. Furthermore, infected cases are managed with antibiotics before surgery.[8]

This study aims to determine the prevalence of thyroglossal duct cyst among pediatric patients undergoing Sistrunk procedure and to evaluate the diagnostic performance of ultrasound combined with thyroid function blood tests compared with postoperative histopathological findings.

METHODS

Study design and setting

Retrospective observational study was performed at Queen Rania Hospital for Children. The subjects for this research were children that had undergone Sistrunk procedure for suspicion of thyroglossal duct cyst between January 2023 and January 2026. The objective of this study was to ascertain the prevalence of thyroglossal duct cyst as confirmed through histopathological analysis and the accuracy of preoperative assessment in diagnosing thyroglossal duct cyst, especially the use of ultrasound and thyroid assessment before the procedure.

All eligible patients were recruited from the hospital's database, surgical, and medical records of the hospital. This research involved children who had undergone Sistrunk procedure due to a suspected thyroglossal duct cyst.

Data collection

Retrospective data collection was done using medical files, pre-operative evaluation notes, ultrasound images, laboratory tests, intra-operative details, and post-operative histopathology reports. Demographic parameters collected included age, gender, and place of residence. The clinical parameters included the presence of neck midline mass, the movement of the mass on swallowing and protruding of the tongue, previous history of infection, incision and drainage, and previous surgery involving the neck.

The pre-operative imaging parameters collected included ultrasound images indicative of thyroglossal duct cyst and cyst diameter. The cyst diameter was measured as a continuous parameter in centimeters as well as categorical based on whether it exceeded 2 centimeters. Laboratory parameters included thyroid-stimulating hormone status, categorized as normal or abnormal.

The primary outcome measure was histopathological diagnosis of thyroglossal duct cyst following Sistrunk surgery. The use of histopathology was deemed the gold standard method for making the diagnosis. Possible alternative histopathological diagnoses postoperatively, which included dermoid/epidermoid cyst, reactive lymphadenopathy, branchial anomaly, lymphangioma, and other benign pathology, were also documented.

Diagnostic accuracy of preoperative ultrasound diagnosis was evaluated relative to histopathology. A combined preoperative assessment based on preoperative impression from clinical findings, ultrasound and thyroid assessment was also evaluated. Other postoperative outcomes such as postoperative infection and recurrence of disease were also obtained where possible.

Statistical analysis

All statistical analyses were carried out using R software. Continuous data were expressed as mean ± standard deviation (SD) or median (IQR). Categorical data were presented as counts (percentages). Histopathologically proved thyroglossal duct cyst (TGDC) constituted the gold standard. Prevalence rates with 95% confidence intervals (CIs) were calculated for children undergoing surgery of Sistrunk operation.

The diagnostic value of preoperative ultrasound examination and a combination of clinical characteristics was assessed by calculating sensitivity, specificity, PPV, NPV with corresponding 95% CI. Comparison between different groups was made applying Welch's t-test, Wilcoxon rank-sum test, chi-square test or Fisher's exact test as required. For identification of independent predictors of TGDC Firth penalized logistic regression model was used, reporting corresponding adjusted odds ratio.

RESULTS

A total of 312 pediatric patients undergoing Sistrunk procedure for suspected TGDC were included. The mean age was 6.36 ± 3.32 years. Male patients accounted for 181 (58.0%) and female patients for 131 (42.0%). Urban residence was recorded in 219 (70.2%). A midline neck mass was documented in 288 (92.3%), and movement

with swallowing or tongue protrusion in 267 (85.6%). History of infection was present in 87 (27.9%), incision or drainage history in 27 (8.7%), and prior neck surgery in 16 (5.1%). The mean cyst diameter was 2.33 ± 0.76 cm, and 195 (62.5%) had diameter greater than 2 cm. Preoperative ultrasound was positive for TGDC in 226 (72.4%), clinical assessment was typical for TGDC in 264 (84.6%), abnormal TSH in 15 (4.8%), and composite preoperative evaluation was positive in 254 (81.4%). Postoperative infection occurred in 28 (9.0%), and recurrence during follow-up in 8 (2.6%) [Table 1].

Histopathology confirmed TGDC in 237 of 312 patients, corresponding to a prevalence of 76.0% (95% CI, 70.9%-80.4%). Alternative histopathological diagnoses included dermoid or epidermoid cyst in 37 (11.9%), reactive lymph node in 18 (5.8%), other benign lesion in 7 (2.2%), branchial anomaly in 7 (2.2%), and lymphatic malformation in 6 (1.9%) [Table 2].

Ultrasound alone yielded 206 true-positive, 20 false-positive, 31 false-negative, and 55 true-negative results. Sensitivity was 0.87 (95% CI, 0.82-0.91), specificity was 0.73 (95% CI, 0.62-0.82), positive predictive value was 0.91 (95% CI, 0.87-0.94), and negative predictive value was 0.64 (95% CI, 0.53-0.73). The composite preoperative evaluation yielded 223 true-positive, 31 false-positive, 14 false-negative, and 44 true-negative results. Sensitivity was 0.94 (95% CI, 0.90-0.96), specificity was 0.59 (95% CI, 0.47-0.69), positive predictive value was 0.88 (95% CI, 0.83-0.91), and negative predictive value was 0.76 (95% CI, 0.63-0.85) [Table 3; Figure 2].

Patients with pathologically diagnosed TGDC had a significantly larger size of cystic lesion than those without pathologically diagnosed TGDC (cyst size: 2.40 ± 0.72 cm vs. 2.14 ± 0.87 cm, P=0.022). The other clinical characteristics that are known to be characteristic for TGDC were also statistically more prevalent in patients with pathological TGDC diagnosis. Thus, patients with pathologically diagnosed TGDC had a significantly higher prevalence of midline neck mass (95.4% vs. 82.7%, P<0.001) and mass movements with swallowing or protrusion of the tongue (88.6% vs. 76.0%, P=0.007). Cysts larger than 2 cm in size were detected in 66.7% patients with confirmed TGDC versus 49.3% patients without confirmed TGDC (P=0.007). Cysts larger than 2 cm in size were detected in 66.7% of patients with confirmed TGDC versus 49.3% of patients without confirmed TGDC (P=0.007). Preoperative ultrasonographic findings suggestive of TGDC were strongly associated with pathological TGDC diagnosis (86.9% vs. 26.7%, P<0.001) (Table 4).

Larger size of the cyst was an independent predictor of TGDC according to the results of the multivariable Firth penalized logistic regression analysis with each cm increase in the cyst's diameter increasing the chances of confirming TGDC by 72% (aOR=1.72, 95% CI=1.06–2.79, P-value=0.028). Preoperative ultrasound positivity was found to be the most significant independent predictor of TGDC (aOR=18.90, 95% CI=9.56-37.36, P-value<0.001). On the contrary, having undergone prior neck surgery had negative predictive value for confirmation of TGDC (aOR=0.11, 95% CI=0.03-0.42, P-value=0.001). After controlling for the effects of other confounders, none of the following factors were identified (Table 5; Figure 1).

With higher cumulative preoperative risk scores, the probability of histopathological confirmation increased. Confirmations were found in 27.3%, 59.6%, 87.0%, and 100% for patients in 0-, 1-, 2-, and 3-point groups, respectively. This result implies the existence of a pronounced dose-response relation. Nevertheless, it is necessary to consider that there were too few patients at 4 points and interpret these results carefully (Figure 3).

The discrimination power of the prediction algorithm can be evaluated by the area under the ROC curve (AUC), which amounted to 0.870. Moreover, the accuracy of predictions is considered acceptable due to the relatively low Brier score (0.114). The calibration analysis also revealed high predictive quality, where the calibration intercept was very close to zero, while the calibration slope was approximately 1. In addition, the maximum variance inflation factor amounted to 1.14.

Table 1: Baseline demographic, clinical, laboratory, imaging, and postoperative characteristics of pediatric patients undergoing Sistrunk procedure.

Characteristic	**N = 312**
Age (years)	6.36 ± 3.32
Symptom duration (months)	8.4 [4.6–15.2]
Cyst diameter (cm)	2.33 ± 0.76
TSH (mIU/L)	1.80 [1.30–2.32]
Free T4 (ng/dL)	1.15 ± 0.13
Follow-up duration (months)	16.3 [11.0–21.5]
Length of stay (days)	2.0 [2.0–3.0]
Sex	
Male	181 (58.0%)

Female	131 (42.0%)
Residence	
Urban	219 (70.2%)
Rural	93 (29.8%)
Midline neck mass	
Yes	288 (92.3%)
No	24 (7.7%)
Moves with swallowing/tongue protrusion	
Yes	267 (85.6%)
No	45 (14.4%)
History of infection	
Yes	87 (27.9%)
No	225 (72.1%)
Incision or drainage history	
Yes	27 (8.7%)
No	285 (91.3%)
Prior neck surgery	
Yes	16 (5.1%)
No	296 (94.9%)
Diameter >2 cm	
Yes	195 (62.5%)
No	117 (37.5%)
Relation to hyoid on ultrasound	
Suprahyoid	41 (13.1%)
At hyoid	149 (47.8%)
Infrahyoid	109 (34.9%)
Deep/lingual	13 (4.2%)
Normal thyroid seen on ultrasound	
Yes	311 (99.7%)
No	1 (0.3%)
Preoperative ultrasound positive for TGDC	
Yes	226 (72.4%)
No	86 (27.6%)
Clinical assessment typical for TGDC	
Yes	264 (84.6%)
No	48 (15.4%)
TSH abnormal (outside 0.4–4.0 mIU/L)	
Yes	15 (4.8%)
No	297 (95.2%)
Composite preoperative evaluation positive	
Yes	254 (81.4%)
No	58 (18.6%)
TGDC on histopathology	
Yes	237 (76.0%)
No	75 (24.0%)
Postoperative infection	
Yes	28 (9.0%)
No	284 (91.0%)
Recurrence during follow-up	
Yes	8 (2.6%)
No	304 (97.4%)

Values are mean ± SD, median [interquartile range], or n (%), as appropriate. TGDC indicates thyroglossal duct cyst; TSH, thyroid-stimulating hormone.

Table 2: Histopathological outcomes in pediatric patients undergoing Sistrunk procedure for suspected TGDC.

Outcome / diagnosis	N	Cases, n	Prevalence / proportion	Wilson 95% CI
Histopath-confirmed TGDC	312	237	76.0%	70.9%–80.4%
TGDC	312	237	76.0%	70.9%–80.4%

Dermoid/epidermoid cyst	312	37	11.9%	8.7%–15.9%
Reactive lymph node	312	18	5.8%	3.7%–8.9%
Other benign lesion	312	7	2.2%	1.1%–4.6%
Branchial anomaly	312	7	2.2%	1.1%–4.6%
Lymphatic malformation	312	6	1.9%	0.9%–4.1%

Prevalence and proportions are calculated among all 312 pediatric Sistrunk-procedure patients. Confidence intervals are Wilson 95% confidence intervals.

Table 3: Diagnostic accuracy of preoperative ultrasound and composite preoperative evaluation compared with postoperative histopathology.

Test	TP	FP	FN	TN	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)
Ultrasound alone	206	20	31	55	0.87 (0.82, 0.91)	0.73 (0.62, 0.82)	0.91 (0.87, 0.94)	0.64 (0.53, 0.73)
Composite preop evaluation	223	31	14	44	0.94 (0.90, 0.96)	0.59 (0.47, 0.69)	0.88 (0.83, 0.91)	0.76 (0.63, 0.85)

Histopathology was considered the reference standard. The composite preoperative evaluation was defined as positive ultrasound or the combination of abnormal thyroid function tests and compatible clinical findings. TP indicates true positive; FP, false positive; FN, false negative; TN, true negative; PPV, positive predictive value; NPV, negative predictive value.

Table 4: Comparison of characteristics by histopathologically confirmed TGDC status.

Characteristic	No TGDC N = 75	TGDC N = 237	P value
Age (years)	6.39 ± 3.36	6.36 ± 3.31	0.94
Symptom duration (months)	11.6 [4.6–18.4]	8.2 [4.7–13.9]	0.10
Cyst diameter (cm)	2.14 ± 0.87	2.40 ± 0.72	0.022
TSH (mIU/L)	1.97 [1.46–2.38]	1.75 [1.28–2.32]	0.082
Free T4 (ng/dL)	1.15 ± 0.12	1.15 ± 0.13	0.96
Follow-up duration (months)	17.0 [10.8–22.6]	16.2 [11.3–21.4]	0.55
Length of stay (days)	2.0 [2.0–3.0]	2.0 [2.0–3.0]	0.32
Sex			0.69
Male	42 (56.0%)	139 (58.6%)	
Female	33 (44.0%)	98 (41.4%)	
Residence			0.85
Urban	52 (69.3%)	167 (70.5%)	
Rural	23 (30.7%)	70 (29.5%)	
Midline neck mass			<0.001
Yes	62 (82.7%)	226 (95.4%)	
No	13 (17.3%)	11 (4.6%)	
Moves with swallowing/tongue protrusion			0.007
Yes	57 (76.0%)	210 (88.6%)	
No	18 (24.0%)	27 (11.4%)	
History of infection			0.25
Yes	17 (22.7%)	70 (29.5%)	
No	58 (77.3%)	167 (70.5%)	
Incision or drainage history			0.48
Yes	8 (10.7%)	19 (8.0%)	
No	67 (89.3%)	218 (92.0%)	
Prior neck surgery			0.002
Yes	9 (12.0%)	7 (3.0%)	
No	66 (88.0%)	230 (97.0%)	
Diameter >2 cm			0.007
Yes	37 (49.3%)	158 (66.7%)	
No	38 (50.7%)	79 (33.3%)	
Relation to hyoid on ultrasound			0.45
Suprahyoid	12 (16.0%)	29 (12.2%)	
At hyoid	35 (46.7%)	114 (48.1%)	

Characteristic	No TGDC N = 75	TGDC N = 237	P value
Infrahyoid	23 (30.7%)	86 (36.3%)	
Deep/lingual	5 (6.7%)	8 (3.4%)	
Normal thyroid seen on ultrasound			0.24
Yes	74 (98.7%)	237 (100.0%)	
No	1 (1.3%)	0 (0.0%)	
TSH abnormal (outside 0.4–4.0 mIU/L)			0.54
Yes	2 (2.7%)	13 (5.5%)	
No	73 (97.3%)	224 (94.5%)	
Preoperative ultrasound positive for TGDC			<0.001
Yes	20 (26.7%)	206 (86.9%)	
No	55 (73.3%)	31 (13.1%)	
Composite preoperative evaluation positive			<0.001
Yes	31 (41.3%)	223 (94.1%)	
No	44 (58.7%)	14 (5.9%)	
Postoperative infection			0.73
Yes	6 (8.0%)	22 (9.3%)	
No	69 (92.0%)	215 (90.7%)	
Recurrence during follow-up			0.21
Yes	0 (0.0%)	8 (3.4%)	
No	75 (100.0%)	229 (96.6%)	

Values are mean ± SD, median [interquartile range], or n (%), as appropriate. P values are from Welch t test for approximately symmetric continuous variables, Wilcoxon rank-sum test for skewed variables, and chi-square or Fisher exact tests for categorical variables, as appropriate.

Table 5: Multivariable Firth penalized logistic regression for factors associated with histopathologically confirmed TGDC.

Predictor	Adjusted OR (95% CI)	P value
Age (per year)	0.97 (0.88, 1.08)	0.62
Female sex	1.01 (0.51, 1.99)	0.98
Cyst diameter (per cm)	1.72 (1.06, 2.79)	0.028
History of infection	1.08 (0.49, 2.39)	0.86
Prior neck surgery	0.11 (0.03, 0.42)	0.001
Preoperative ultrasound positive	18.90 (9.56, 37.36)	<0.001
TSH abnormal	1.24 (0.16, 9.51)	0.84

Adjusted odds ratios are from a Firth penalized logistic regression model. TGDC indicates thyroglossal duct cyst; CI, confidence interval.

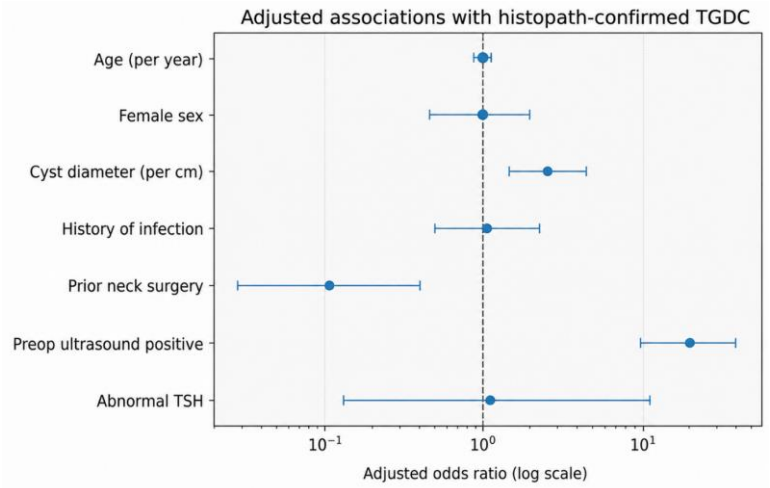

Figure 1: Adjusted odds ratios for histopathologically confirmed TGDC.

Forest plot of adjusted odds ratios from the Firth penalized logistic regression model. Points represent adjusted odds ratios and horizontal bars represent 95% confidence intervals.

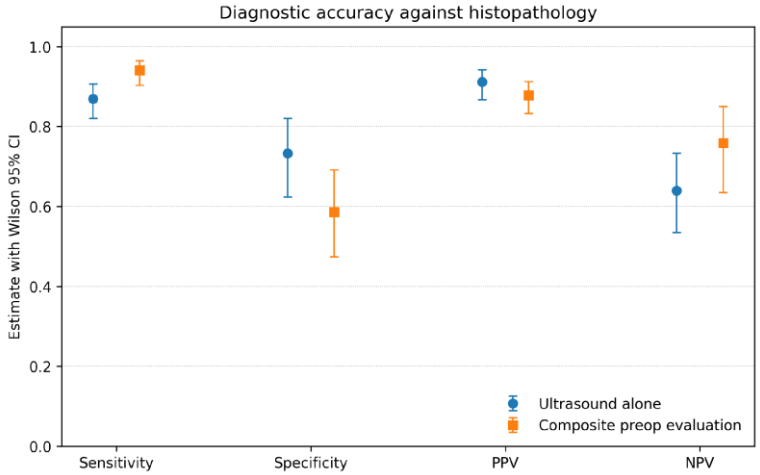

Figure 2: Diagnostic accuracy of preoperative evaluation strategies.

Comparison of sensitivity, specificity, positive predictive value, and negative predictive value for ultrasound alone and the composite preoperative evaluation, using histopathology as the reference standard.

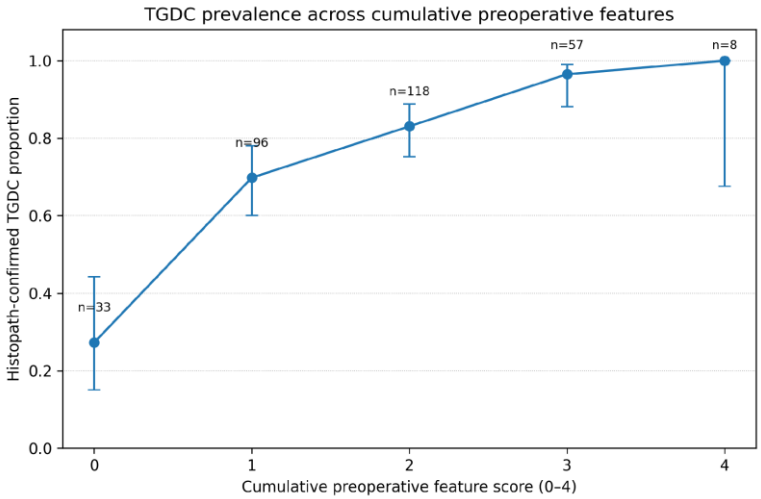

Figure 3: Histopathologically confirmed TGDC by cumulative preoperative feature score.

Proportion of histopathologically confirmed TGDC according to increasing cumulative preoperative feature burden. Error bars represent 95% confidence intervals.

DISCUSSION

The histopathological confirmation rate in this surgical cohort is 76.0% among children with suspected TGDC who have had a Sistrunk procedure. The result reflects histopathologically confirmed TGDC in surgically selected patients, but not the prevalence of TGDC in all children with neck masses. The other pathology included dermoid/epidermoid cysts, reactive lymph nodes, branchial abnormalities, benign lesions, and lymphatic malformations. Thus, TGDC shows a significant overlap with other pediatric neck masses and emphasizes the importance of accurate preoperative investigation.

The clinical presentation was consistent with embryological development of TGDC. According to previous studies, TGDC results from the failure of the thyroglossal duct to involute during fetal development.[1-4] That explains why the most common clinical presentation of histopathologically confirmed TGDC was midline neck swelling, associated with movement with deglutition and protrusion of tongue.[8-13] However, clinical presentation of non-TGDC also included similar features, thus being insufficiently specific to distinguish them.

The accuracy characteristics of ultrasonography were high as follows: sensitivity was 0.87, specificity was 0.73, PPV was 0.91, and NPV was 0.64. The above results suggest the usefulness of ultrasound as the primary modality for diagnosing TGDC among children. The benefits of this examination are associated with its ability to estimate cystic appearance, localization, connection with hyoid apparatus, and the presence of properly located thyroid gland without any radiation.[7,12,13,17,18] High PPV implies that a positive diagnosis provided a good opportunity to confirm the diagnosis via histopathological methods. The negative predictive power of this method was moderate, and it did

not help to rule out the disease due to small size, infection, previous drainage, or unusual appearance of the lesion.

Composite assessment of preoperative diagnostics improved sensitivity to 0.94 and NPV to 0.76; however, it lowered specificity up to 0.59. It indicates that there is some balance between the benefit and potential risks of composite assessment. The use of clinical assessment, ultrasonography, and thyroid-related evaluation leads to fewer missed diagnoses, although more false-positive diagnoses occur. Hence, composite assessment could be helpful for screening purposes, but other diagnoses also need to be considered.

Cyst size emerged as an independent predictor of histopathologically confirmed TGDC, whereby a 1-cm rise in cyst diameter increased the odds of confirmed TGDC by 72%. Cysts of larger dimensions are more easily diagnosed on physical examination and ultrasonography. The anatomical association between the mass and midline area and/or hyoid region might also be easier to assess in larger cysts. Conversely, small masses may resemble dermoid cysts, reactive lymphadenopathy, and lymphangiomas.

Preoperative ultrasound positivity emerged as the most important predictor of histopathological confirmation, with an adjusted odds ratio of 18.90. Such a finding highlights the importance of ultrasonography in addition to clinical examination. It also underscores the necessity of standardized documentation of sonographic characteristics (size, cystic nature, localization in midline or paramedian region, relationship to hyoid bone, inflammation, and location of the thyroid gland).[12,13,18]

A history of previous neck surgery was associated with negative diagnosis of TGDC. This may suggest that patients in such a category have a more complicated presentation of the disease, being characterized by recurrent inflammation, scar formation, misdiagnosis, and other pathology besides TGDC. In any case, a child having undergone prior neck surgery requires additional consideration prior to surgical procedure.

Thyroiditis was common among diagnosed cases of TGDC in the univariate analysis; however, it was not a significant predictor in the multivariate logistic regression model. This indicates that thyroiditis could just be incidental rather than an actual marker for diagnosis. It is still crucial to conduct the thyroid examination since TGDC and thyroid glands are embryologically connected and ectopic thyroid gland may rarely occur as a midline neck mass.[1-4, 7-9, 13] Nevertheless, TSH abnormality was not a statistically significant predictor of TGDC.

An interesting dose-response pattern in the cumulative preoperative feature score was found in that TGDC confirmation increased from 27.3% in score 0 to 100.0% in score 4. In addition, the model was discriminative, with AUC of 0.870, and had good predictive accuracy, with Brier score of 0.114. Such results indicate that a simple preoperative score may be helpful for diagnosing probability classification. Nonetheless, there were only 8 subjects in the score 4 group, which may need external validation.

Infection after surgery was observed among 9.0% of subjects, whereas recurrent cases were found in 2.6%. The low frequency of recurrence suggests that the Sistrunk procedure effectively minimizes recurrence by eliminating the cyst, central hyoid portion, and the tract tissue.[5,6,8–10] Infection may be associated with previous infection, incision, and drainage and inflammation preoperatively.

There are several strengths associated with the study; the sample size was relatively larger, involving pediatric patients from two prominent centers. Histopathology is the gold standard used in the study, whereas the study included a comparison between ultrasound alone and a combination of other diagnostic tools during the preoperative stage. Firth penalized logistic regression analysis was appropriate given the small cell counts.

A key limitation of this study is its restriction to children who already underwent Sistrunk procedure for suspected TGDC, introducing selection and surgical verification bias. As a result, the diagnostic performance of preoperative evaluation particularly sensitivity and PPV may be overestimated compared with an unselected population of pediatric neck masses in general clinical practice. Therefore, findings should be interpreted as applicable to a surgical cohort rather than a diagnostic screening population.

CONCLUSION

Almost three-quarters of children who underwent the Sistrunk procedure for suspected TGDC were histopathologically diagnosed with TGDC. Ultrasound proved to be a valuable tool with regard to sensitivity and positive predictive value. The composite test was able to increase both sensitivity and negative predictive value but lowered the specificity. Larger size of the cyst and positive results from ultrasound examination increased the chances of confirmation, whereas previous neck surgery decreased these chances.

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