

Thyroglossal Duct Infections and Surgical Outcomes

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Purpose: Thyroglossal duct cysts (TGDC) are the most common head and neck congenital anomalies in children and often present as infected neck masses. The authors reviewed their experience with TGDC to determine if preoperative infection was related to postoperative complications, including recurrence and postoperative infection.

Methods: The medical records of 99 patients undergoing excision of TGDC from January 1991 to July 2002 were reviewed. Factors thought to be associated with recurrence (age, history of infection, drainage, abscess, and operative procedure) were analyzed.

Results: Ninety-nine patients made up the study group. The mean age at operation was 5.0 years (range, 6 months to 16 years) with a male to female ratio of 1.6:1. TGDC recurred in 12.1% (12 of 99) of these patients. There was no gender difference for those with and without recurrence. The presence of an abscess or cellulitis preoperatively (22 of 99 patients) did not correlate with recurrence (NS). In addition, postoperative infection occurred in 13 of 99 patients and also

was independent of preoperative infection. However, postoperative infection clearly was associated with an increased risk of TGDC recurrence. Seven of 87 patients without recurrence had a postoperative infection, whereas 6 of 12 of those who had a recurrence had a postoperative infection ($P < .001$). The mean follow-up was 3.7 years and was comparable for the 2 groups (recurrence v. resolution). Twelve patients successfully underwent a second procedure for recurrence.

Conclusions: In this large series of TGDC, preoperative infection occurred in approximately 1 of 5 patients and was not predictive of recurrence. Although postoperative infection did not correlate with the presence of preoperative infection, it was clearly associated with a statistically significant incidence of recurrent disease.

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INDEX WORDS: Thyroglossal cysts, thyroglossal duct, recurrence, infection.

THYROGLOSSAL CYST disease is frequently encountered in children and adolescents. It usually is identified as a midline neck swelling but may present with infection. The management of infected thyroglossal duct cysts (TGDC) traditionally has included antibiotics with incision and drainage (I&D) when needed. The aim of this study was to evaluate the authors' experience in the management of primary and recurrent thyroglossal cyst disease and to determine what factors are associated with postoperative complications such as TGDC recurrence and infection.

MATERIALS AND METHODS

After obtaining IRB approval (IRB # 0211-118X), the medical records of all patients with a diagnosis of thyroglossal cyst disease treated at our institution from January 1991 through July 2002 were

reviewed. Data collected included patient age, gender, clinical presentation, the presence of preoperative infection, the need for I & D, postoperative infection, recurrence, and the type of definitive procedure performed. Clinic notes were used to follow the postoperative course, and discharge from clinic was assumed to represent a successful outcome. Patients with documented preoperative infection or abscess, I & D, postoperative infection, or recurrence were contacted by telephone to confirm the status of their clinical course. The χ^2 test was used for proportional analysis, and the Student's t test was utilized for comparison of sample means. A P value of less than .05 was considered statistically significant.

RESULTS

One hundred five patients were identified as having TGDC preoperatively. Ninety-nine were proven to have thyroglossal duct remnants, and histologic examination identified 6 specimens as dermoid cysts. The study group was made up of 61 boys and 38 girls resulting in a gender ratio of 1.6:1. Age at operation ranged from 6 months to 16 years with a mean age of 5.0 years. The most common presenting complaints were a mass alone without infection (66 of 99), an abscess (18 of 99), a mass with a draining sinus without infection (10 of 99), a mass with cellulitis (4 of 99), and a draining sinus without a mass (1 of 99; Table 1). Most TGDC were found in the classic midline infrahyoid position. However, 9 patients were noted to have their TGDC in atypical locations: 5 were

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Table 1. The Primary Presenting Signs in this Series of 99 Patients With a Thyroglossal Duct Cyst

Sign	No. of Patients
Mass alone (no infection)	66
Abscess	18
Mass/draining sinus (no infection)	10
Mass with cellulitis	4
Draining sinus (no infection)	1
TOTAL	99

suprahyoid, 3 were infrahyoid and to the left, and 1 was infrahyoid and to the right.

Clinical Outcomes

TGDC recurred in 12.1% (12 of 99) of the patients. There was no gender difference for those with or without recurrences. We analyzed these data in 2 ways. First, of the 99 patients who presented with a TGDC and underwent surgical intervention, there was no evidence of preoperative infection in 77. In this group without preoperative infection, 9 patients had recurrence of their disease, whereas 68 recovered uneventfully. Of the 22 patients who did have preoperative infection, 18 of these presented initially with an abscess, and 4 presented with cellulitis. In the 18 patients with preoperative abscess formation, drainage of the abscess was accomplished in 15 patients (11 I & D and 4 spontaneously drained). In this group of 15 patients, only 1 patient had recurrent disease. In the 3 patients with abscess who were treated with antibiotic therapy, one patient had a recurrent TGDC. In addition, in the 4 patients who presented initially with cellulitis and underwent preoperative antibiotic therapy, 3 had an uneventful postoperative recovery without evidence of recurrent disease; however, one did have a recurrent TGDC. There was no statistical

difference regarding recurrence between those patients who presented with infection (3 of 22) compared with those who did not present in this way (9 of 77; Fig 1).

The second way in which these data were analyzed compared postoperative infection with the development of recurrent disease. Postoperative infection developed in 13 of the 99 patients and was independent of preoperative infection. In 87 patients, there was no evidence of recurrent disease, and only 7 of these 87 (8%) patients had a postoperative infection. Although only 8% of the patients with successful resection without recurrence had a postoperative infection, 50% of those who developed a recurrence (6 of 12) had a postoperative infection ($P < .001$). Thus, 12 patients had recurrent disease, in which, 6 of these recurrences were found in patients with a postoperative infection, and 6 were not associated with postoperative infection. Each of these 12 patients with recurrent disease underwent reoperation with wide excision of the area and re-excision of the hyoid bone; there was no evidence of second recurrences in this series (Fig 2). The mean length of follow-up in this series was 3.7 years, and was similar for the 2 groups (recurrence *v* resolution).

DISCUSSION

Thyroglossal cyst disease is the most common developmental neck lesion in the pediatric population. There is a slight male predominance. These lesions usually present as a midline mass, but can present initially as a draining sinus or abscess (Fig 3). Clinically, the cyst usually is in the midline infrahyoid position with the duct extending cephalad from the cyst through the hyoid bone to the foramen cecum. Variations in the normal embryologic development may lead to slight differences in the

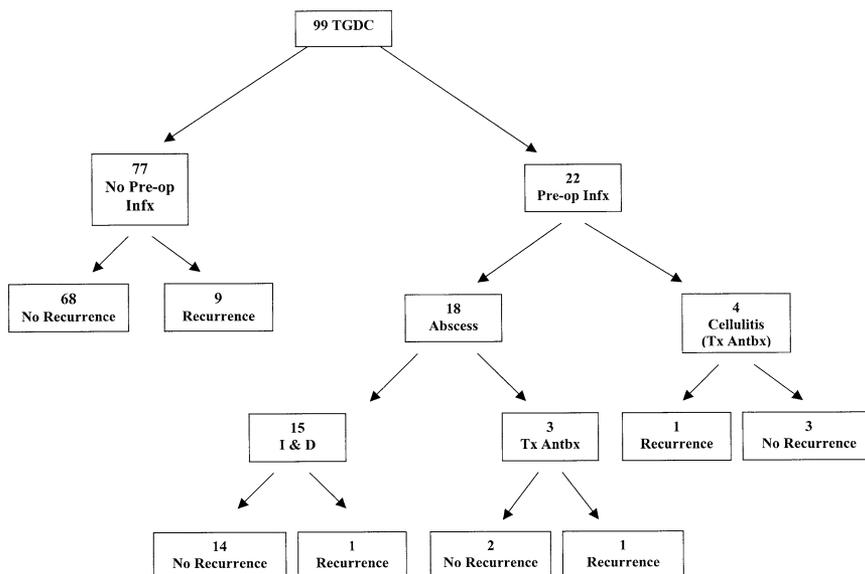


Fig 1. This schematic shows the clinical course of the 99 patients in this series regarding whether preoperative infection was present.

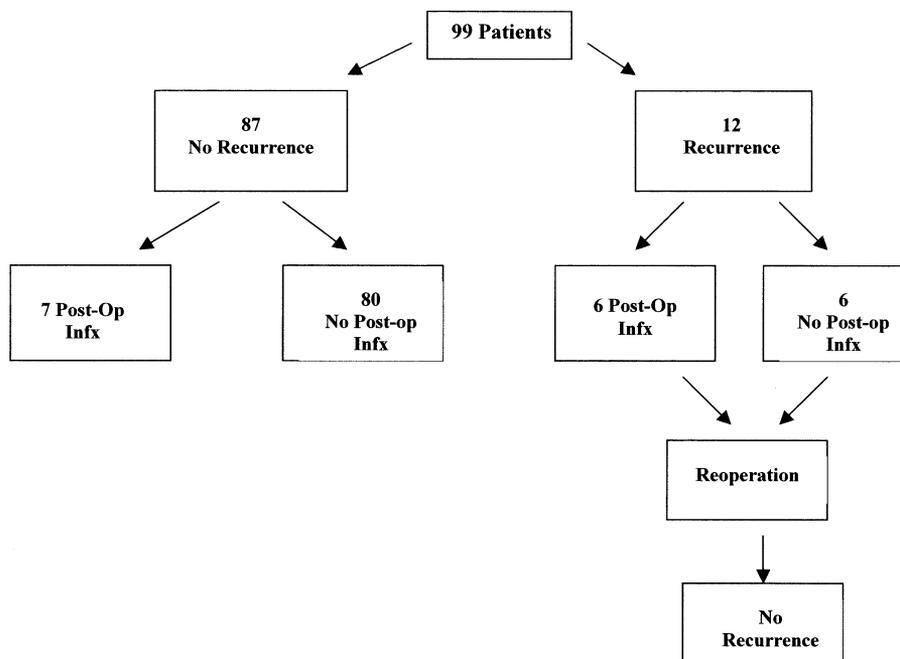


Fig 2. This algorithm describes the relationship between recurrent disease and the development of a post-operative infection in this series of 99 patients.

location of a TGDC.¹⁻³ This tendency for aberrant location was seen in our series in which 9 patients had their TGDC in an atypical location. The thyroglossal duct has a varying number of branches and secretory glands, which merge into a single duct at the level of the cranial portion of the hyoid bone. As this single duct approaches the foramen cecum, it branches into many ductuli.⁴ The duct epithelium can vary from columnar to stratified squamous, and associated ectopic thyroid tissue is found in up to 8% of specimens.^{3,5}

There are few reports on the management of infected TGDCs in the literature. Some of these are historical in nature. Pollock and Stevenson⁶ felt that an inflamed cyst should not be incised unless absolutely necessary because the definitive operation is easier in the absence of scar tissue or a cutaneous fistula. They reported that the inflammation will subside spontaneously, and it can be treated with antibiotics. Twelve years later, Brereton and Symonds⁷ suggested that most cysts have some degree of infection or inflammation at presentation and recommended early surgery after diagnosis. Recently, Ducic et al⁸ noted that preoperative infection was the only statistically significant clinical difference noted between a successful and an unsuccessful outcome in their series. However, histologic analysis of their specimens showed there was a substantially greater number of multiple thyroglossal duct tracts noted in the group that did not respond to a Sistrunk procedure. Similarly, Flageole et al⁹ noted that 40% of their TGDCs that were initially infected had recurrence, whereas only 8% recurred in 87 that were not infected initially. Similar findings were described by Athow et al¹⁰ as well.

In our series, there was no statistical relationship between the presence of preoperative infection and the development of postoperative infection or recurrent disease. However, there was a statistically significant relationship between the development of postoperative infection and recurrent disease. This information may be beneficial when counseling parents on the expected postoperative course when their child has a preoperative TGDC infection. At the same time, in our series as well as in other reports, a recurrence rate of 10 to 15% should be mentioned to the parents before the initial operation.

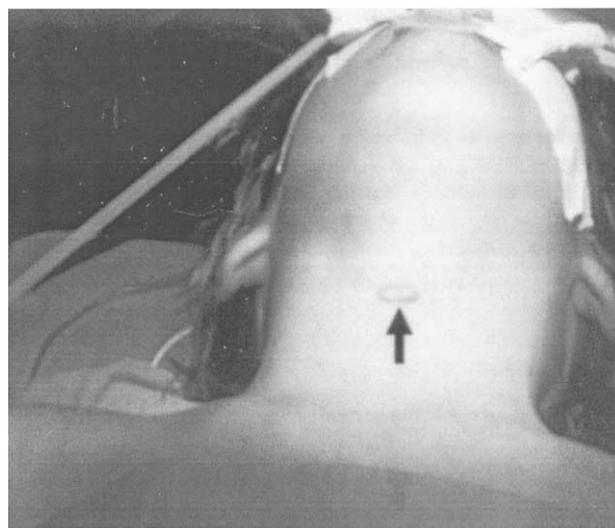


Fig 3. A patient with a thyroglossal duct cyst and underlying swelling is shown. The black arrow points to a cutaneous fistula tract from the thyroglossal duct cyst.

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Discussion

A. Coran (Ann Arbor, MI): Thank you for that presentation. I have one question. Do you think your postoperative infections are really infections, or are they recurrences that then appear as an infection? In other words, which came first, the chicken or the egg?

S.C. Burjonrappa (response): Sir, as you saw in our presentation, we had 13 infections total, and 7 of our infections actually resolved without recurrence, so we feel that even though postoperative infection might be a

marker for recurrence, it does not necessarily mean that all postoperative infections mean recurrence.

T. Buchmiller-Crair (New York, NY): Did you use antibiotics in the postoperative period if there was a history of prior infection? Were your groups truly similar?

S.C. Burjonrappa (response): No. We treated the infections that presented preoperatively with antibiotics and did surgery only after the initial infection was cleared. There was no sort of routine antibiotic dosage after surgery.