Thyroglossal cysts: a clinico-pathological study

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Abstract Objective: To review our experience with thyroglossal cysts outlining the clinical features as well as aspects of histology and management.
Design: A retrospective study.
Setting: Qatif Central Hospital, Division of Pediatric Surgery, Department of Surgery and Department of Pathology.
Subjects: The subjects were 49 patients: 29 females and 20 males (F:M of 1.5:1). Mean age 15.4 years (range 11 months- 56 years).
Results: Thirteen had thyroglossal sinus, 2 presented with thyroglossal abscess and later thyroglossal sinus, 27 had thyroglossal cyst and 7 turned out to have other diagnosis. Of those with thyroglossal cysts 74% were below the hyoid bone, 22% suprahypoid and 3.7% over the hyoid bone. Five of the thyroglossal cysts were away from the midline. Histology revealed epithelial linings in 27 out of 37 studied cases and no epithelial lining in 10. Thyroid follicles were seen in 21 patients and salivary gland tissue in 4. There were 2 minor wound infections and 3 recurrences. Infection was the main reason for recurrence.
Conclusion: Thyroglossal cysts are the commonest midline neck swellings in the pediatric age group. To minimize complications and recurrence in particular any lesion whose presentation is typical of a thyroglossal cyst should be treated early with Sistrunk's operation.

Keywords: Thyroglossal cyst, thyroglossal sinus.

Thyroglossal cysts are the commonest cause of midline neck swellings in the pediatric age group. Their clinical features have been well described for many years, and the postoperative recurrence rate has been remarkably reduced since Schlange in 1893 and later Sistrunk in 1920 described the operative procedure for the proper excision of thyroglossal cyst.

Missed diagnosis and the fact that the duct is frequently multiple and branched leading to inadequate operation are the main reasons for recurrence. Infection is another reason predisposing to recurrence.

This is a review of our experience with thyroglossal cysts outlining the different clinical features as well as aspects of histology and management.

Patients and methods The medical charts of all patients operated on for thyroglossal duct lesions at Qatif Central Hospital from 1989 to 1994 were reviewed. The records were analyzed for duration of symptoms, age at operation, sex, mode of presentation, type of operation performed, operative findings, post-operative complications and outcome. The histology of the lesions was obtained from the histopathology report and the histological sections which consisted of representative samples from each specimen were reviewed by one pathologist. The histological criteria for diagnosis adopted were the presence of ductular or cystic structures lined by simple cuboidal or columnar epithelium or non-keratinizing stratified epithelium without skin appendages.

Results Forty-nine patients were operated on for thyroglossal duct lesion at Qatif Central Hospital. There were 29 females and 20 males (F:M of 1.5:1). Their ages at operation ranged from 11 months to 56 years (mean 15.4 years), and 34 (69.4%) were below 18 years of age. The duration

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of symptoms varied from one patient to the other. In four of our patients the cysts appeared shortly after birth but they presented to the hospital at 1 1/2, 2 1/2, 5 and 12 years of age. In the remaining 45 patients, the duration of symptoms varied from 1 week to 18 years with a mean of 17 months. Of the 49 patients, 7 turned out to have another diagnosis, either intraoperatively or on subsequent histology. This was in the form of follicular adenoma in 2 patients, epidermoid cyst in one, lymph node reactive and caseating in one each and chronic non-specific fibrofatty tissue in two patients with discharging midline sinuses. Thirteen of the remaining 42 patients had thyroglossal sinuses and 2 presented with thyroglossal abscess which required incision and drainage and subsequently developed thyroglossal sinus giving a total of 15 (35.7%) with thyroglossal sinus and 27 with thyroglossal cyst. Of those with thyroglossal cyst, 6 (22%) were suprathyroid, one over the hyoid bone (3.7%) and the remaining 20 (74%) were infrathyroid. Five (18.5%) of the thyroglossal cysts were away from the midline at their presentation, 3 to the right and 2 to the left of midline.

Histological evaluation was available for 37 patients. These were evaluated for the type of epithelium lining the ducts as well as other types of tissue present as shown in the table.

Post-operative complications included two minor wound infections and on follow-up ranging from 7 months to 6 years and 2 months (mean = 3.4 years), 3 patients developed recurrence. All three patients with recurrences occurred after excision of infected thyroglossal sinuses.

<table>
<thead>
<tr>
<th>Type of epithelium lining</th>
<th>No</th>
<th>%</th>
<th>Type of non-epithelium lining</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory</td>
<td>10</td>
<td>27</td>
<td>Thyroid follicles</td>
<td>21</td>
<td>57</td>
</tr>
<tr>
<td>Stratified squamous</td>
<td>7</td>
<td>19</td>
<td>Seromucous gland</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Mixed type</td>
<td>9</td>
<td>24</td>
<td>Salivary glands</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Cuboidal</td>
<td>1</td>
<td>3</td>
<td>Lymphoid tissue</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>No epithelium</td>
<td>10</td>
<td>27</td>
<td>Foreign body giant cells</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cartilaginous tissue</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

*Table 1*

*Fig. 1: Thyroglossal cyst lined by respiratory epithelium (H & E x 100).*
Discussion

Embryologically the thyroid gland develops at the foramen cecum and reaches its final position anterior to the trachea by the 7th week of embryological development maintaining its attachment to the tongue by a duct which usually disappears, but in some it persists leading to cystic formation.12,13

Thyroglossal cysts are the commonest cause of midline neck swellings between the ages of 6 months and 15 years.1 Classically they present as a midline cystic swelling that moves with protrusion of the tongue, but one of the preoperative diagnostic difficulties is when the cyst occurs away from the midline. Five of our patients (17%) presented with cystic swellings that were not in the midline, 3 deviated to the right side and 2 to the left. This is similar to previous reports11,14,15 and must be taken into consideration when evaluating these patients preoperatively, and intraoperatively. Failure to recognize this and inappropriate surgery will result in recurrence. The majority of thyroglossal cysts occur in the midline and 65% are below the hyoid bone, 20% above the hyoid bone and 15% in the region of the hyoid bone. In our series 76% were below the hyoid bone, 21% above the hyoid bone and only 3% in the region of the hyoid bone.

Of interest was the findings in 7 of our patients who were operated on as thyroglossal abscess, sinus in 2 and thyroglossal cyst in 5, but turned out to have follicular adenoma in 2, epidermoid cyst in 1 and tuberculous abscess and reactive non-specific lymphadenopaties in one each, and chronic non-specific inflammation in 2 patients. The diagnosis of follicular adenoma became apparent at operation and was confirmed histologically. The tuberculous abscess was diagnosed microbiologically. Athow et al11 found 9 patients (22%) out of 40 children operated on for thyroglossal cyst to have other pathology. While it may not be possible to reach the correct diagnosis preoperatively, it is of great importance in deciding the type of surgery. In order to obviate recurrence, simple excision should be avoided when the original presentation of the condition is typical of thyroglossal cyst. We agree with others than when there is any doubt as to the exact nature of the lesion, a Sistrunk's operation should be performed.11

The postoperative recurrence rate of thyroglossal cyst has been reduced since Schlange2 advocated excision of the central portion of the hyoid bone as well as accompanying cyst and later Sistrunk3 who advocated excision of a core of tissue from the center of the hyoid bone up to and including the foramen cecum. The

Fig. 2: Thyroglossal cyst with thyroid follicles (H & E x 100).
Fig. 3: Thyroglossal cyst with salivary gland tissue (H & E x 100).

importance of this has been stressed by Harisawa et al. We adopted the policy of resecting between 1-1 1/2 cm of the central portion of the hyoid bone together with the cyst and traced the duct up to the site of the foramen cecum without entering the oral cavity. The main reasons for recurrence nowadays are the presence of inflammation and missed diagnosis leading to inappropriate operation. We had 3 cases of recurrence in our series and in all of them the reason for recurrence was the presence of infection in the sinuses which makes it difficult to dissect and excise the tract completely which has proven to be multiple with side branches rather than a simple duct.

The timing of surgical excision of thyroglossal cyst is of great importance. We agree with others that thyroglossal cysts should be excised when diagnosed. This will obviate the complication of infection and the subsequent high recurrence rate as a result and also act against malignant change arising in thyroglossal duct remnants which has been reported in adults as well as children. None of our patients had malignant transformation but 36% presented with thyroglossal sinus, and 3 of them developed recurrence. To overcome this, physicians caring for these patients must be aware of this complication and refer them early before they become infected.

Thyroglossal cysts and sinuses are usually lined by respiratory epithelium, which was present in 10 of our patients. Stratified squamous epithelium was seen in 7 of our patients, cuboidal epithelium in 1 patient and mixed type of epithelium in 7 patients. In 10 of our patients, no epithelial lining was seen. Absence of epithelial lining and squamous metaplasia are not infrequent findings in response to recurrent infections. Thyroid follicles were seen in 21 of 37 histologically studied cases (57%) (Fig. 2). This is higher than previous reports. The reason for this variation is not known. One explanation for this is the meticulous review of our specimens by one pathologist. Of interest was the finding of salivary gland tissue in 4 of our patients (11%) (Fig. 3). Solomon and Rangecroft reported similar findings in 3 of their patients. None of our patients showed malignant change. The importance of meticulous histological evaluation is stressed by the occasional incidental finding of malignant change in the cysts.
References

الخلاصة:

الغرض من الدراسة:
مراجعة خبرتنا في علاج الكيسة الдрقية اليسانية موضعين الجوانب السريرية بالإضافة إلى اختلافات الأنسجة الموجودة وطريقة العلاج.

خطة العمل:
دراسة رجعية.

مكان الدراسة:
مستشفى القطيف المركز - قسم الجراحة وقسم الأنسجة.

الأشخاص المعيّنون للدراسة:
شملت الدراسة 49 مريض، 29 أنثى و20 ذكر بين اعمارهم ما بين 11 شهر و69 سنة (متوسط العمر 45 سنة).

النتائج:
13 مريض كان لديهم ناصوراً درقياً لسانيّاً، إناث كان عندهم خراج درقي لساني تطور إلى بعد ذلك ناصور درقي لساني و27 كان عندهم كيسة درقية لسانيّة بينما 7 وجد عندهم تشخيص آخر. 74% من المرضى الكيسة اليسانية كان الكيس ظاهر للجسم، 22% فوق العظم اللامامي و23% في منطقة العظم اللامامي. الكيسة اليسانية كانت بعيد عن الوسط عند 5 من المرضى. التحليل النسيجي أثبت بطنية طائلية في 47 من 37 مريضاً غير وجود بطنية طائلية عند العشرة الآخرين. جريبات درقية كانت موجودة عند 21 مريض وأغشية الغدد اللعابية عند 2 مرضى. كان هناك إتتصاب خفيف في الجرح عند 2 من المرضى وثلاثة مرضى ظهر عنهم فتحة درقية لسانيّة ناكسة.

الاستنتاج:
يعتبر الكيس اليساري اليساني أكثر أورام وسط الرقبة شيوعًا عند الأطفال ولتقليل المضاعفات وخصوصاً نسبة رجوعها فإن أي كيس مشابه للكيس اليساري اليساني سيرينا يجب أن يستوصى وذلك بعملية سيسترنك.