International Journal of Pediatric Otorhinolaryngology 77 (2013) 45–48

Contents lists available at SciVerse ScienceDirect

International Journal of Pediatric Otorhinolaryngology

journal homepage: www.elsevier.com/locate/ijporl

Preoperative computed tomography of suspected thyroglossal duct cysts in children under 10-years-of-age

Dong Hoon Lee [a], Se Hee Jung [b], Tae Mi Yoon [a], Joon Kyoo Lee [a,*], Young Eun Joo [c], Sang Chul Lim [a]

[a] Department of Otolaryngology-Head and Neck Surgery, Chonnam National University, Medical School and Chonnam National University Hwasun Hospital, Jeonnam, South Korea
[b] Department of Radiology, Chonnam National University, Medical School and Chonnam National University Hwasun Hospital, Jeonnam, South Korea
[c] Research Institute of Medical Sciences, Chonnam National University, Medical School and Chonnam National University Hwasun Hospital, Jeonnam, South Korea

ARTICLE INFO

Article history:
Received 30 July 2012
Received in revised form 7 September 2012
Accepted 14 September 2012
Available online 4 October 2012

Keywords:
Thyroglossal duct cyst
Computed tomography
Pathology
Children

ABSTRACT

Objective: The purpose of this study was to evaluate the preoperative computed tomography (CT) features of thyroglossal duct cysts (TDCs), with the main purpose of evaluating criteria helpful in differentiating TDCs from other lesions in children under 10-years-of-age.
Methods: A retrospective chart review was performed at Chonnam National University Hospital for the period of March 2005 to June 2011. Pediatric patients under 10-years-of-age with suspected TDCs were divided into two groups depending on their histopathologic diagnosis.
Results: Of the 29 pediatric patients with suspected TDCs, 16 patients (55%) had histopathologically confirmed TDCs. Thirteen patients (45%) had dermoid cysts ($n = 6$), ranula ($n = 3$), and inflammatory lesions ($n = 4$). There were no statistically significant differences between the preoperative CT findings and the final histopathologic diagnosis of TDC. There were no major complications resulting from surgical interventions.
Conclusion: CT is not helpful in differentiating TDC from other lesions in children under 10-years-of-age. Therefore, we suggest that preoperative CT of suspected TDCs in children should be performed more selectively.

1. Introduction

Neck masses are common findings at all ages and the differential diagnosis includes a wide range of pathologies. Such lesions may be caused by infectious, inflammatory, tumoral, traumatic lymphovascular, immunologic, or congenital etiologies [1]. Thyroglossal duct cysts (TDCs) are the most common anomaly of the neck in childhood [2]. In most circumstances, a clinical history and physical examination are sufficient to make a correct preoperative diagnosis [3]. However, in one study, specimens clinically suspected as TDCs revealed true cysts in only 46% of cases upon pathologist examination [4]. Therefore, preoperative imaging is necessary to confirm the diagnosis [5].

We have considered computed tomography (CT) to be a valuable and sufficient technique for the assessment of TDC in children [1]. In this article, we discuss the preoperative CT features of TDCs, with the main purpose of evaluating the criteria helpful in differentiating TDC from other lesions in children under 10-years-of-age.

2. Materials and methods

After obtaining Institutional Review Board approval of Chonnam National University Hwasun Hospital, a retrospective review was performed to evaluate patients with a preoperative diagnosis of TDC at the Department of Otolaryngology-Head and Neck Surgery, Chonnam National University Hospital and Hwasun Hospital from March 2005 to June 2011. A diagnosis of suspected TDC was made based on clinical history and physical examination. Thirty-three patients less than 10-years-of-age with a preoperative diagnosis of TDC were identified based on the medical records.

Charts were reviewed to obtain information about preoperative diagnostic workup, surgical procedures, pathologic diagnosis, and postoperative clinical outcomes. The CT scans of the 33 children with TDC were retrospectively reviewed by one radiologist. Four patients for whom suspected TDC could not be conclusively identified based on CT were excluded. The CT scans of the remaining 29 patients were evaluated for the following features: site of the mass, relationship to the midline, walls, margins, internal septa, rim enhancement, and internal density. The site was

* Corresponding author at: Department of Otolaryngology-Head and Neck Surgery, Chonnam National University, Medical School and Hwasun Hospital, 160 Ilsimri, Hwasun, Jeonnam 519-809, South Korea. Tel.: +82 61 379 8190; fax: +82 61 379 7761.
E-mail address: joonkyoo@jnu.ac.kr (J.K. Lee).

0165-5876/$ – see front matter © 2012 Elsevier Ireland Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.ijporl.2012.09.027

characterized in relation to the hyoid bone and midline. The low density ranged between 10 and 25 Hounsfield units [5,6].

All the patients underwent contrast-enhanced CT. Nonionic iodinated contrast agent (Ultravist®, Schering AG, Berlin, Germany) was intravenously administrated (a total of 100 ml, 2 ml/s) and the CT scans were obtained with two different multi-detector CT scanners (Light speed VCT and Sensation Cardiac 64). Scanning parameters were as follows: 120 kV, 200–250 mAs, pitch of 1.2, 0.5 s gantry rotation time, 40-mm detector coverage, 2.5–3.0-mm slice thickness, 2.5–3.0-mm interval. The CTDI for this protocol of acquisition ranged between 25 and 30 mGy and the DLP ranged between 705 and 1111 mGy cm depending on the scanning range. We used tube current modulation to reduce the radiation dose.

The remaining 29 patients suspected to have TDCs underwent a Sistrunk operation. All specimens were confirmed histopathologically. The patients with suspected TDCs were divided into two groups depending on their histopathologic diagnosis. Patients in group 1 were confirmed histopathologically to have TDCs. Patients in group 2 were confirmed histopathologically to have lesions other than TDCs. The criteria for diagnosing TDCs were based on the presence of ductular and/or cystic structures lined with cuboidal or columnar epithelium or non-keratinizing stratified epithelium without epidermal appendages. For the statistical analysis, Fisher's exact test was performed using SPSS version 14.0. Statistical significance was defined as a p-value <0.05.

3. Results

The most common clinical presentation of TDC in the 29 pediatric patients with suspected TDCs was midline neck masses observed in all patients. Preoperative evaluations included clinical history, physical examination, and radiologic procedures.

The 16 group 1 patients (55% of total) had histopathologically confirmed TDCs (Fig. 1). This group of children included nine (56%) males and seven (44%) females. The age of the patients ranged between 2 and 10 years with a mean of 6.38 years. Of the 16 lesions, eight (50%) were located in the midline and eight were located just to one side of the midline (right = 2, left = 6). Twelve (75%) were infrahyoid in location, four (25%) were at the level of the hyoid, and none was suprahyoid. Twelve (75%) out of sixteen patients had well-circumscribed walls and peripheral rim enhancement. The internal septas were seen in four of the cysts. All but one of the cysts demonstrated homogeneous or low density attenuation. A summary of the group 1 clinical data is shown in Table 1.

Table 1
Summary of the group 1 and 2 clinical data.

	Group 1	Group 2	
Gender (M:F)	9:7	9:4	
Average age (years)	6.38 (range, 2–10)	4.08 (range, 1–9)	
Site (relationship to the midline, R:Mid:L)	2:8:6	1:11:1	$p > 0.05$
Site (relationship to hyoid bone, SH:H:IH)	0:4:12	0:2:11	$p > 0.05$
Well-circumscribed wall	12 (75%)	7 (54%)	$p > 0.05$
Peripheral rim enhancement	12 (75%)	11 (85%)	$p > 0.05$
Internal septa	4 (25%)	6 (46%)	$p > 0.05$
Homogeneous	15 (94%)	12 (92%)	$p > 0.05$
Low density	15 (94%)	12 (92%)	$p > 0.05$

M, male; F, female; R, located just to right side of the midline; Mid, located in the midline; L, located just to left side of the midline; SH, suprahyoid location; H, at the level of the hyoid; IH, infrahyoid location.

The 13 group 2 patients (45% of total) had histopathologically confirmed lesions other than TDCs (dermoid cysts, $n = 6$, Fig. 2; ranulas, $n = 3$, Fig. 3; inflammatory lesions, $n = 4$, Fig. 4). This group of children included nine (69%) males and four (31%) females. The age of the patients ranged between 1 and 9 years with a mean of

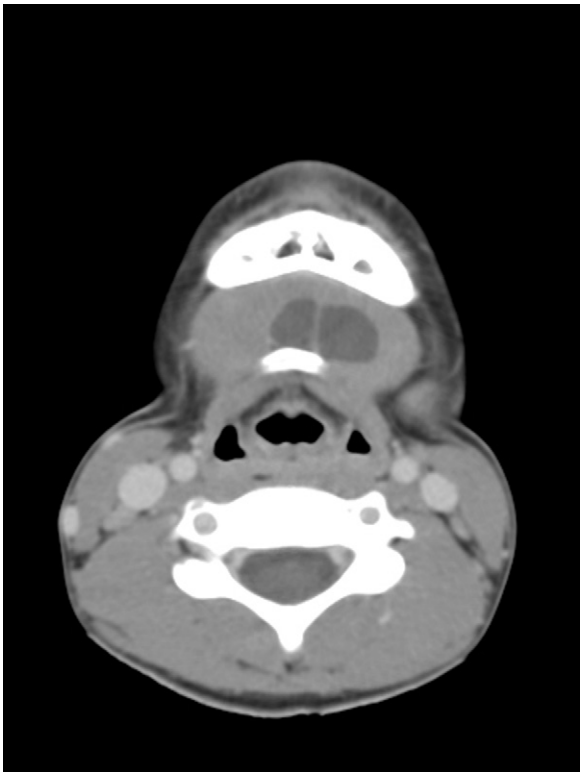

Fig. 1. Thyroglossal duct cyst in a 7-year-old male. Axial contrast-enhanced CT scans shows a hypoattenuated cyst and septated lesion in the left side of midline anterior neck in hyoid level.

Fig. 2. Dermoid cyst in a 4-year-old male. Axial contrast-enhanced CT scans shows a smooth thick walled and unilocular lesion in midline infrahyoid anterior neck.