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Fine Needle Aspiration Study of Papillary Thyroid Carcinoma in a Thyroglossal Duct Cyst- A Rare Case.

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ABSTRACT

Thyroglossal duct cysts are the most common congenital cysts present in the anterior aspect of the neck. Thyroglossal duct cyst carcinoma (TDCa) is extremely rare and in a majority of cases, diagnosis can be established only after excision. A very few cases of pre-operative FNAB of thyroglossal duct cysts with papillary carcinoma have been reported in English literature so far. Dilemma also persists regarding the source of origin of the tumour and the treatment regime to be followed. This case reports highlights the efficacy of FNAB in the diagnosis of papillary carcinoma in thyroglossal duct cyst. The diagnostic pitfalls are also discussed.

KEYWORDS : Thyroglossal duct cyst, fine-needle aspiration biopsy, papillary carcinoma.

Introduction

Thyroglossal duct cysts (TDC) are the most common congenital anomaly of the thyroid gland arising from the remnants of thyroglossal tract. Malignant transformation is seen in 0.7-1% cases and is characterised by relatively non-aggressive behaviour and rare lymphatic spread[1,2]. Papillary carcinoma is the most common malignancy found in TDC. Very few reports describing the cytology of Thyroglossal duct carcinoma have been published in the past

This case of TDC with papillary carcinoma diagnosed preoperatively on cytology is presented because of the rarity of such cases.

Methodology and Case details:

A 34 year old male patient presented with painless midline neck swelling, which was progressively increasing in size since two months. Patient was asymptomatic otherwise. The thyroid function test was normal. There was no history of radiation exposure.

On physical examination there was a well-defined, oval shaped cystic nodule measuring 3x2 cm2 in the infrahyoid location. It moved on deglutition and protrusion of tongue. There was no cervical lymphadenopathy and thyroid gland was normal on palpation.

Contrast enhanced CT Scan showed well-defined 2.5x1.8 cm cystic lesion in the left para median location, placed anterior to the thyroid cartilage, placed in the infrahyoid neck. It showed an irregular 10x8 mm sized enhancing mural nodule with foci of calcification along medial aspect of the cyst. Both the lobes of thyroid and isthmus were normal appearing with no significant cervical lymphadenopathy.

The FNAB was performed using a 23-gauge disposable needle. Approximately 5 mL of thin light-yellow fluid was obtained during the initial aspiration and the cyst was substantially decompressed. A second FNAB was performed to sample the residual mass. Air-dried and alcohol-fixed smears were prepared from the aspirate and stained using Romanowsky and Papanicolaou methods, respectively.

Cytological study of these smears showed atypical epithelial cells in sheets, papillae and clusters. Cells showed nuclear overlapping and pleiomorphism. Nuclear grooves and nuclear pseudoinclusions were also identified.

Based on cytomorphology a diagnosis of papillary carcinoma in thyroglossal duct cyst-"cystic type" was made. The patient underwent Sistrunk operation and the diagnosis was confirmed on histopathology.

DISCUSSION:

The thyroglossal duct is a persistent remnant of the thyroid gland's embryologic descending tract from the floor of the pharynx to its final position in the neck. Thyroglossal duct cysts occur most commonly in the midline, just inferior to the level of the hyoid bone. They are the most frequently encountered congenital abnormality of the neck and is estimated to occur in 7 % of the adult population[3,4].

Carcinoma arising in this tract is a very uncommon clinico-pathological entity. Till date only 215 cases of malignant transformation in TDCs have been reported in the literature[5]. The median age at presentation is 40 years and females are affected slightly more as compared to males. Most of these arise from the ectopic thyroid tissue in the cyst. As per the previous studies, papillary carcinoma is the most common type(80%), followed by mixed papillary-follicular carcinoma(8%) and squamous cell carcinoma(6%). Remaining 6% include rare cases of Hurthle cell carcinoma, follicular and anaplastic carcinoma. Regional lymph node metastasis of papillary carcinoma in TDC is seen in less than 8%. Medullary variants have not yet been reported[6,7,8]. Thyroglossal duct cyst carcinoma(TDCa) usually presents as an asymptomatic neck swelling and the diagnosis is usually made post-operatively after histo-pathological examination. A rapid increase in the size of the cyst, fixation, history of radiation exposure, presence of cervical lymphadenopathy, the presence of mural nodule on ultrasonography especially with calcifications must raise the suspicion of malignancy[9]. Imaging techniques alone (US, scintigraphy and CT) are usually unable to diagnose malignant disease preoperatively.

Fine-needle aspiration is a useful pre-operative diagnostic modality. Only 17 cases of preoperative FNAB of TDCs with papillary carcinoma have been reported previously in the English literature, ours being the eighteenth case.Other cystic lesions of the neck that should be considered in the differential diagnosis of thyroid cysts are thyroglossal and branchial cysts, parathyroidal cyst and cystic lymph node metastases of papillary carcinoma.On FNABthe aspirates yield a mucoid or yellow fluid with a mixture of inflammatory cells and single or clustered squamous or cylindrical cells. During the FNAB of TDC, cystic fluid is often the initial sample obtained, hence it should be reaspirated once the cyst is decompressed and a diligent search for atypical cells should be made while seeing the smears. The diagnostic criteria

for papillary carcinoma are the same whether it arises in the TDC or thyroid proper. Smears show increased cellularity, with atypical cells arranged in papillae, nuclear overlapping and crowding, enlarged nuclei with anisonucleosis and powdery chromatin. Intranuclearpseudoinclusions and grooves are the significant diagnostic criteria. Psammoma bodies, multinucleated giant cells, and ropy colloid are variably present. Although the diagnostic criteria of PTC on FNAB have been defined, diagnostic pitfalls in giving definitive diagnosis of PTC arising in TDC are very common. FNAB yielded correct results in only 50-60% of cases[10]. As per the study by Yang et al, a preoperative FNAB has shown to have poor true and false-negative rates, at 53% and 47%, respectively[11]. In contrast, according to Miccoli et al, patients that underwent a repeat FNAB resulted in 100% sensitivity and specificity in a group of nine patients subjected to this procedure, especially when performed under ultrasound guidance.

Identifying the origin of the tumour poses a great diagnostic drawback with FNAB. Despite the relatively frequent association of primary thyroid involvement in addition to a thyroglossal duct cyst carcinoma, in our case, the presence of papillary carcinoma within the thyroglossal duct, normal thyroid scintigraphy, and CT scan, unencapsulated nature of the lesion(thus ruling out lymph node metastasis), absence of cyst wall invasion,and size of the lesion less than 1 cm, support the view of a papillary carcinoma in situ[12].

Surgical treatment of these carcinomas is controversial. An overall review of the studies prove that simple excision of the cyst by using Sistrunk's procedure is sufficient if capsular invasion is not present[9]. Thyroidectomy should be considered if thyroid shows some clinical or radiological change[9,13]. Neck dissection should be considered in case of positive lymph nodes[9,13]. Long-term follow-up is necessary.

Conclusion:All TDC patients must be subjected to image-guided FNAB for early and accurate diagnosis of TDC carcinoma for timely clinical intervention. A suspicious or definitive diagnosis of cancer pre-operatively by FNAB expedites patient management and an optimum surgical procedure can be accordingly planned.

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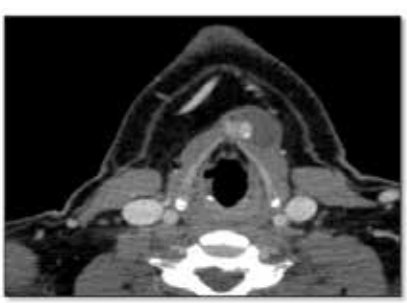

Figure 1: Contrast Enhanced CT Scan - Thyroid tissue mass in the thyroglossal duct

Figure 1 should be inserted after the text on contrast enhanced CT scan.

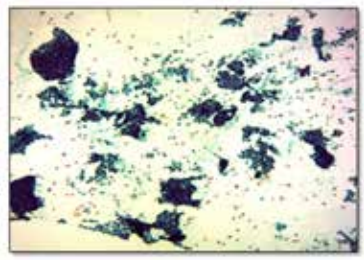

Figure 2: Fine needle aspiration biopsy (PAP 10X): Sheets, papillae and clusters of follicular epithelial cells

Figure 2 should be inserted after" Cytological study of these smears showed atypical epithelial cells in sheets, papillae and clusters."

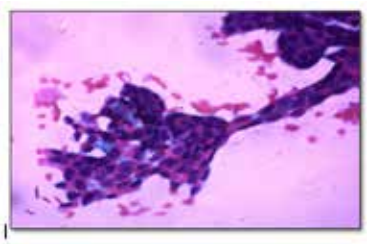

Figure 3: Fine needle aspiration biopsy (PAP 40X): Papilla with cytological features characteristic of FTC

Figure 3 should be inserted after "Cytological study of these smears showed atypical epithelial cells in sheets, papillae and clusters."

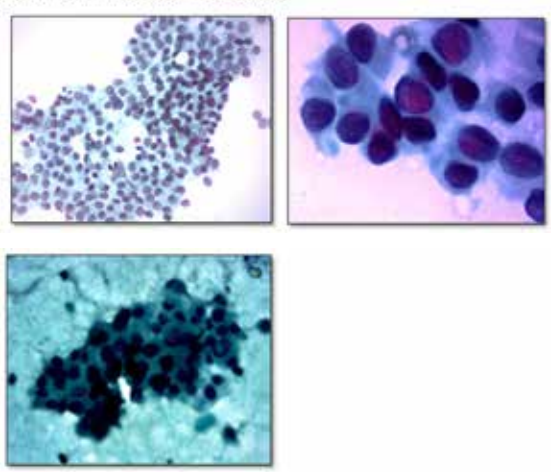

Fig 4: Fine needle aspiration biopsy: A. –(PAP 40X) Papillae & Sheets showing nuclear enlargement , overlapping & overcrowding, powdery chromatin.. **B.** (PAP 100X) nuclear grooves and **C.** (PAP 40X) pseudoinclusions.

Figure 4 should be inserted after" Cells showed nuclear overlapping and pleiomorphism. Nuclear grooves and nuclear pseudoinclusions were also identified."

REFERENCES

[1]. Heshmati HM, Fatourechi V, van Heerden JA, Hay ID, Goellner JR. Thyroglossal | duct carcinoma: report of 12 cases. Mayo Clinic Proceedings 1997; 72(4):315–9 | [Epub 1997/04/01]. | [2]. Fernandez JF, Ordonez NG, Schultz PN, Samaan NA, Hickey RC. Thyroglossal duct carcinoma. Surgery 1991; 110(6):928–34, discussion 34–5. [Epub 1991/12/01]. | [3]. Fernandez JF, Ordonez NG, Schultz PN, et al. Thyroglossal duct carcinoma. Surgery 1991; 110: 928-935. | [4]. Martin-Perez E, Larranaga E, Marron C. Primary papillary carcinoma arising in a thyroglossal duct cyst. Eur J Surg 1997; 163: 143-145. | [5]. Chu YC, Han JY, Han HS, Kim JM, Min SK, Kim YM Primary papillary carcinoma arising in a thyroglossal duct cyst . Yonsei Medical Journal 2002; 43 (3):381-84. | [6]. Ozturk O, Demirci L, Egeli E, et al. Papillary carcinoma of the thyroglossal | duct cyst in childhood. Eur Arch Otorhinolaryngol 2003; 260: 541- | 543. | [7]. Song-I Yang, Kwang-Kuk Park, Jeung-Hoon Kim Papillary carcinoma arising from thyroglossal duct cyst with thyroid and lateral neck metastasis. International Journal of Surgery Case Reports 2013;4: 704-707 | [8]. Bowell WS, Zoller M, Williams JS, Lord SA, Check W. Thyroglossal duct carcinoma.Am Surg 1994;60: 65-5. | [9]. Godara R, Marwah S, Ahuja V, Sen J, Marwah N,Sushila. Papillary carcinoma in a thyroglossal duct cyst: A case report and literature review. Journal of Chinese Clinical Medicine April 2009; 4 | (4); 238-40 | [10]. Yang YJ, Haghir S, Wanamaker JR, Powes CN. Diagnosis of papillary carcinoma in a thyroglossal duct cyst by fine needle aspiration biopsy. Arch Pathol Lab Med 2000; 124:139-42 | [11]. Yi Jun Yang, Shahandeh Haghir, John R. Wanamaker, Celeste N. Powers, Diagnosis of Papillary Carcinoma in a Thyroglossal Duct Cyst by Fine-Needle Aspiration Biopsy. Arch Pathol Lab Med 2000; 124: 139-142 | [12]. Heshmati HM, Fatourechi V, Heerden JA, et al. Thyroglossal duct carcinoma: report of 12 cases. Mayo Clin Proc. 1997;72: 315-9. PMID: 9121176. | [13]. Patel SG, Escrg M, Shaha AR, Singh B. Management of well differentiated thyroid carcinoma presenting in a thyroglossal duct cyst. J Surg Oncol 2002;79: 134-39. |