

Fine needle aspiration diagnosis of Carotid Body Tumor (Paraganglioma) in a patient suspected of Tuberculosis

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Abstract

Carotid body tumor (CBT) or paraganglioma is a rare tumor which presents as a mass in the lateral part of the neck. It is typically a slow-growing and asymptomatic mass in the beginning, arising from the chief cells of carotid body which is situated at the bifurcation of the common carotid artery. We describe detection of one such tumor by fine needle aspiration cytology in a 30-year-old lady with left neck swellings clinically suspected of tubercular lymphadenitis. The aspirate was hemorrhagic with clusters of round to oval cells showing moderate anisokaryosis and uniform nuclear features. Delicate fibrous strands with spindle cells were also observed within these clusters. Based on these cytologic findings and location of the swelling, a diagnosis of CBT was made. It was evaluated later on by Doppler USG which supported our diagnosis. Subsequently the mass was excised and the diagnosis was confirmed on histopathological examination. Our case report adds to the existing literature on cytologic diagnosis of CBT, further attesting to its safety and accuracy. Also, stating the importance of morphology which is still the cornerstone in the field of pathology for reaching final diagnosis.

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1. Introduction

Carotid body tumors (CBT) or paragangliomas are rare tumor and originate from neural crest cells. Paragangliomas may be seen at numerous sites.^[1] When primary site is adrenal gland the tumor is called pheochromocytoma, in the head and neck area, paraganglioma are mainly found in the carotid body, jugular, and vagal glomus, among other sites. The manifestations of the tumor are variable; in most cases, it presents as an asymptomatic slow growing mass, compressing the surrounding anatomic structures.^[2] Herein, we present a case of 30 years-old-lady presenting with complaints of fever and neck swelling with clinical suspicion of tuberculosis which was diagnosed as a CBT on cytology.

2. Case Report

A 30-year-old lady was referred to our institution for evaluation of a slow-growing swelling in the left side of her neck since 10 years. As the patient was having complaints of fever and bodyache, clinicians were suspecting tuberculosis and she was advised fine needle aspiration cytology (FNAC). On examination, it was a single $2 \times 1.5 \times 1$ cm firm, painless, non-pulsatile swelling on the left side of the patient's neck. It was not moving with deglutition. It was moving with horizontal movements but not with vertical movements. There was no other palpable neck swelling or enlarged lymph node. FNAC was done using a 23 gauge needle and non-aspiration technique. Two to three needle passes were made, and material was obtained for cytologic study. The procedure was uneventful, with no complications on follow-up. Both air-dried (May-Grünwald Giemsa stain) and wet-fixed (Haematoxylin and eosin stain, and Papanicolaou stain) smears were prepared.

The smears were moderately cellular with hemorrhagic background. Smears showed tumor cells arranged singly and in discohesive groups. At places, cells were intermingled with capillaries. Cells had round-to-oval nuclei showing marked variation in size, uniform granular chromatin, 2-3 micronucleoli and abundant ill-defined cytoplasm. Few large bare nuclei were also observed (Figure 1 and 2). Fine fibrous strands containing spindled cells were seen admixed with some groups (Figure 3). Few cells showed cytoplasm with red granularity. Lymphoid cells, mitotic figures, and necrotic debris were notably absent. These cytomorphological features were strongly suggestive of a paraganglioma. In view of the typical location and cytologic findings, a diagnosis of CBT was made.

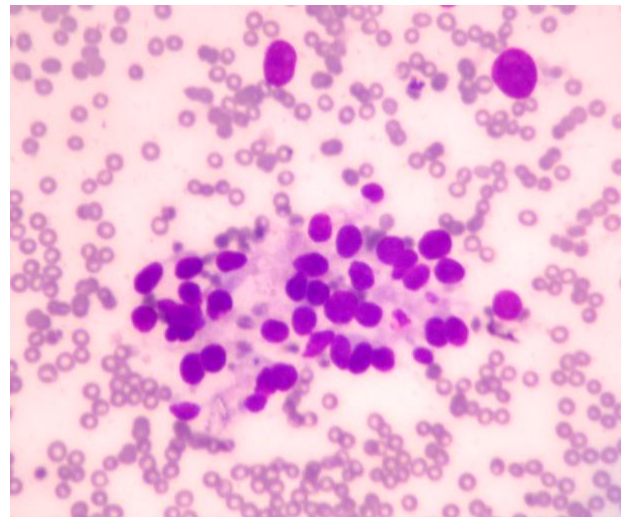


Figure 1: Photomicrograph shows cells with indistinct cell borders, eosinophilic cytoplasm, uniform finely granular dispersed chromatin showing anisonucleosis (H&E, x400).

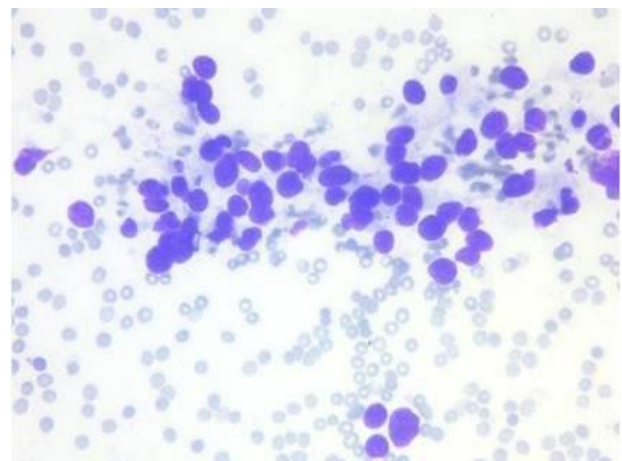


Figure 2: Photomicrograph shows cells with indistinct borders, eosinophilic cytoplasm and evenly distributed chromatin (MGG stain, x200).

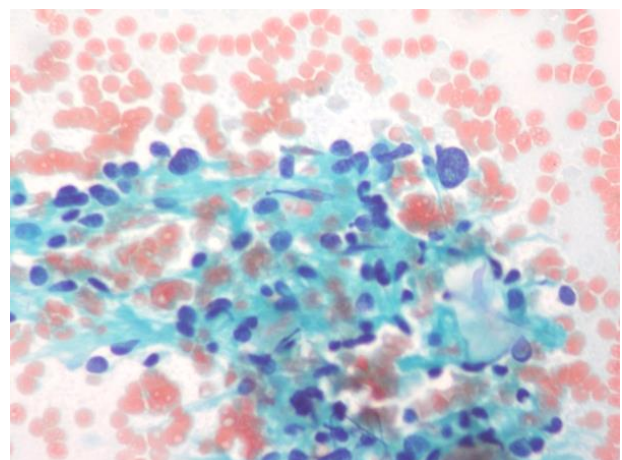


Figure 3: Photomicrograph shows cells with spindling, representing sustentacular cells (PAP stain, x400).

Later on, the patient was evaluated by Doppler USG which supported our diagnosis and it also detected another small clinically non-palpable nodule on opposite side of neck. Subsequently patient underwent surgery. Intra-operatively the mass was found to be adherent to the bifurcation of the carotid artery. The adhesions were removed, and the mass was excised completely. The histopathological examination revealed a classic Zellballen pattern in the lesion, with immunohistochemistry confirming the cytodiagnosis of CBT.

Immunohistochemistry Findings: Tumor cells (Chief cells) expressed Synaptophysin (Figure 4), Chromogranin and Non Specific Enolase (NSE). Sustentacular cells wrapping the packets of tumor cells showed S-100 positivity. Tumor cells were immunonegative for Cytokeratin, Vimentin and Thyroid Transcription Factor (TTF-1).

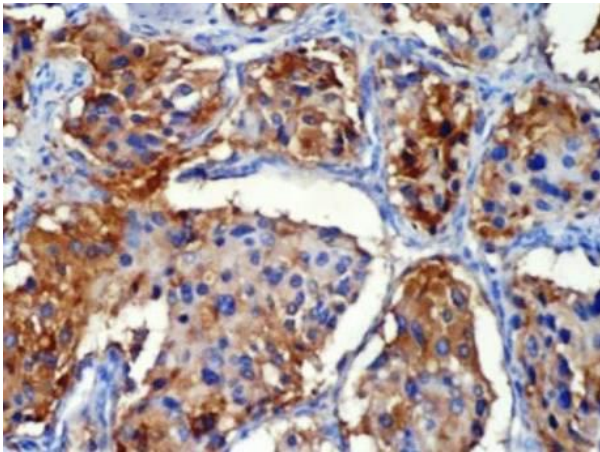


Figure 4: Histopathology section shows Synaptophysin positivity with typical nesting and Zellballen pattern (IHC DAB, x400).

3. Discussion

CBT are rarely subjected to FNAC due to the perceived high risk for procedure-related bleeding.^[3,4] However, with the proper technique, appropriate needle calibre and a minimal number of needle passes (one or two), the risk of hemorrhage could be markedly reduced. A prior Doppler USG investigation is very useful for alerting the cytopathologist to the possibility of CBT when dealing with a lateral neck mass.^[5,6] The smears tend to be invariably haemorrhagic, and special techniques may be necessary to concentrate the cellular elements.^[1] Interpretation is also tricky, and the diagnosis may be easily missed if the lesion is not suspected on clinical examination. The usual differential diagnoses on cytology include metastatic carcinoma, lymphoma, thyroid and parathyroid tu-

mours.^[3] Metastatic carcinoma was ruled out on the basis of the chromatin pattern and the absence of prominent macronucleoli. In particular, the cells of metastatic renal cell carcinoma have clear or eosinophilic vacuolated cytoplasm and are associated with delicate blood vessels. There were no lymphoglandular bodies, mitosis or apoptosis to favour lymphoma. In medullary carcinoma of the thyroid, the cells are distributed predominantly in singlets, showing spindled, round or plasmacytoid forms, red cytoplasmic granularity and occasional small clumps of amyloid-like material. Serum calcitonin and immunocytochemistry may be helpful in difficult cases. Follicular neoplasms of the thyroid show either repetitive microfollicles or sheets of cells with scanty or absent colloid. The aspirates of parathyroid adenoma contain monomorphic cells with round hyperchromatic nuclei and abundant cytoplasm. The FNAC findings of CBT have been described in the literature mainly as case reports.^[1,3,4,5] Most of them not only agree on the difficulty of cytodiagnosis of CBT but also stress the usefulness of FNAC as a tool in the preoperative diagnosis of this rare lesion.^[1,3,5,9] FNAC diagnosis of CBT can be safely attempted if adequate care and precautions are taken during the procedure.^[1,7,9] Familiarity with the cytomorphology of CBT, clinical correlation and a high index of suspicion, help in ensuring accurate diagnosis.^[8]

4. Conclusion

Up till now after various studies, case reports and publications, still the role of FNAC in cases of CBT is controversial. This case report stresses mainly on the usefulness of cytomorphology which is the most important. Without sound morphology and knowledge, the pathologist may misinterpret it to make a wrong diagnosis and important diagnosis like CBT may be missed which puts the patient in long list of further investigations and workup.

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Competing Interests

None declared.

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