

## Case Report

# The importance of fine needle aspiration in conjunction with radiologic examination in the evaluation of granular cell tumor presenting as a thyroid mass: a case report

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Received November 11, 2010; accepted January 15, 2011; Epub January 30, 2011; published February 15, 2011

**Abstract:** Granular cell tumor presenting as a thyroid mass is very rare. It may arise from the thyroid gland or from the tissues/organs adjacent to the thyroid gland. It may cytologically mimick other common thyroid tumors. The accurate evaluation of these tumors may be important for management. We describe a granular cell tumor arising from the tissue adjacent to the thyroid gland and with multiple organ/tissue involvement in a 27-year-old woman with an initial presentation of a thyroid mass. The diagnosis was made by fine needle aspiration and immunocytochemical stains in conjunction with radiological examination. To our knowledge, there is no previous report of such cases in the literature and the importance of fine needle aspiration in conjunction with radiologic examination in the evaluation of granular cell tumor presenting as a thyroid mass has not been well addressed.

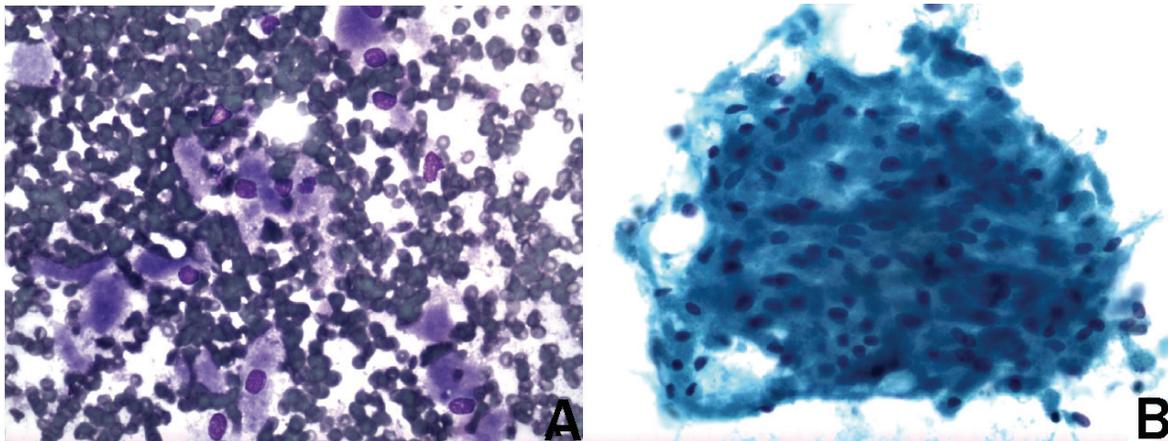
**Keywords:** Cytology, fine needle aspiration (FNA), granular cell tumor, immunostaining, thyroid gland, radiography

Granular cell tumor (GCT) is a neoplasm of neural origin and rarely presents as a thyroid mass. It may resemble other common thyroid tumors, may arise from organs/tissues adjacent to the thyroid gland and may be multiple. Fine needle aspiration (FNA) is very often the only pathologic evaluation for a thyroid neoplasm before a thyroidectomy. Therefore, accurately evaluating a GCT presenting a thyroid mass is important.

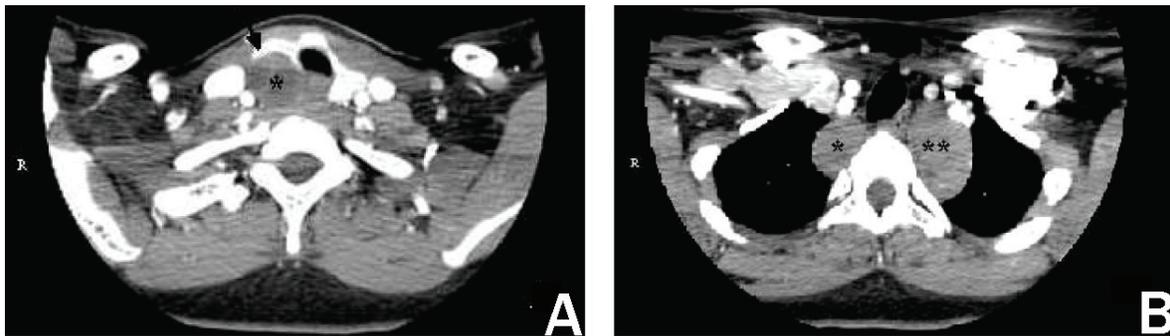
### Report of a case

A 27-year-old woman had a right thyroid mass for six years. The mass had grown gradually in size. The patient was otherwise asymptomatic and healthy. On physical examination the nodule was mobile and non-tender and there was no cervical or supraclavicular adenopathy. Ultrasonography (US) showed a 4.2 x 2.8 x 2.3 cm solid mass with scant vascularity in the right thyroid lobe. An US-guided FNA of the mass was performed. Diff-Quik stained and Papanicolaou-stained smears showed many large polygonal

cells with relatively small pyknotic and raisinoid nuclei, associated with abundant coarsely granular cytoplasm, ill-defined cell borders, and arranged singly or in clusters (**Figure 1A**). The clusters of tumor cells had a syncytial appearance (**Figure 1B**). There was no colloid in the background. Immunostaining revealed the cells to be positive for S100 and CD68 and negative for TTF-1, thyroglobulin, chromogranin, and calcitonin, which was consistent with a GCT. Because of the rarity of a thyroid GCT, Computed tomography (CT) of the neck and chest was subsequently performed to determine the extent of the tumor and revealed that "the thyroid mass" was a large, lobular, well-circumscribed neck mass partially embedded within and inseparable from the posterior aspect of the right thyroid lobe. The mass displaced the thyroid lobe anteriorly and superiorly (**Figure 2A**). The mass also insinuated across the midline in the prevertebral space and most likely invaded the esophagus. Two other additional oval, homogeneous soft-tissue masses were identified in the



**Figure 1.** Fine needle aspiration smears showing that granular cell tumor cells are arranged singly (A) or in clusters with a syncytial appearance (B) (A. Diff-Quik, x 400; B. Papanicolaou, x 400).



**Figure 2.** A. CT-scan of neck showing a large mass (\*) that is posterior to the thyroid gland and displaces the right thyroid lobe (arrow) anteriorly. B. CT-scan of chest demonstrating bilateral paraspinal masses (\* right mass; \*\* left mass).

paraspinal spaces of the superior mediastinum at T1 through T3 level (**Figure 2B**). Then, a CT-guided needle core biopsy of the neck mass was performed which confirmed the diagnosis of GCT. Based on the extent of the tumor, metastasis was favored. Thus, the patient was recommended to receive chemotherapy before considering surgical resection of the tumors.

#### Discussion

A GCT presenting as a thyroid mass can be a diagnostic challenge on FNA because its cytomorphology resembles that of Hürthle cell tumor, papillary carcinoma with Hürthle cell changes, and medullary carcinoma which are the more commonly encountered thyroid neo-

plasms. However, with careful examination one can find that, in contrast to Hürthle cell tumor, papillary carcinoma with Hürthle cell changes, and medullary carcinoma, GCTs usually have larger polygonal cells with a relatively small, uniform, more pyknotic and raisinoid nuclei and a lower nuclear to cytoplasmic ratio; the cytoplasm is more coarsely granular; and the cell borders are more ill-defined and have a fading-away, or windswept, quality, which causes clusters of tumor cells to appear syncytial. In addition, there is no evidence of extracellular material, e.g., colloid or amyloid, in the background. The expressions of S100 and CD68 by immunostaining are characteristic for a GCT, which are useful for distinguishing this tumor from their mimickers.

A GCT presenting as a thyroid mass may arise from the thyroid gland or from its adjacent organs/tissues including the trachea, paratracheal region, larynx, hypopharynx, and esophagus [1-6]. A primary thyroid GCT is so rare that the published pathology studies are limited to only a few case reports including four histology studies and three cytology studies [7-13]. It has been reported that GCTs arising from the organs/tissues adjacent to the thyroid gland were misdiagnosed as primary thyroid GCTs [6, 14]. The GCT may involve multiple organs/tissues. The treatment of choice for primary thyroid GCTs may be different from that used for the GCTs involving the thyroid gland but arising from the adjacent organs/tissues, e.g., the latter may need more extensive surgical dissection, even chemotherapy and/or radiation therapy due to the extensiveness and possible metastasis as the case in this report. Therefore, the primary site of the tumor and the extensiveness of the tumor involvement should be confirmed by radiographic examination.

In summary, this case study shows that a GCT arising from the tissue adjacent to the thyroid gland can present as a thyroid mass and have multiple organ/tissue involvement. Therefore, recognition of the cytomorphological features of GCTs on FNA specimens and their distinction from other commonly encountered thyroid neoplasms is important for making a preoperative diagnosis. Ancillary immunostaining for S100 and CD68 is extremely valuable for rendering the specific diagnosis especially for GCTs with an atypical cytomorphology [13]. Thorough radiological evaluations for determining the primary site and the extent of the tumor are necessary.

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