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LETTER TO THE EDITOR

Infarcted papillary thyroid cancer after fine needle aspiration biopsy

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To the Editor,

A 41-year-old male presented with a right thyroid nodule; ultrasound revealed a 3.3 cm, hypoechoic nodule with central hypervascularity. Ultrasound-guided fine needle aspiration biopsy (FNAB) was performed, showing clusters of abnormal follicular cells with enlarged nuclei, grooves, pseudo-inclusions, and clear chromatin. A diagnosis of a papillary carcinoma was made. Forty-three days after the FNAB, the patient underwent total thyroidectomy with central bilateral lymph node dissection. The right lobe contained a $3.2 \times 3.2 \times 2.1$ cm, completely infarcted tumor surrounded by a thick and fibrous capsule; the tumor showed papillary architecture consistent with papillary carcinoma, but no nuclear features were identified (see Fig. 1). Examination of the lymph nodes revealed metastatic papillary carcinoma in three of nine nodes.

Infarction of a thyroid nodule is a rare event with few cases reported in the literature; complete infarction of a nodule is extremely uncommon after FNAB. In partial infarction, viable tissue is replaced with necrotic debris surrounded by a rim of granulation tissue and a few viable cells [1–3]. In complete infarction, the entire tumor is replaced by a fibro-inflammatory process [2]. Mechanisms by which FNAB may induce infarction include the interruption of the microvascular supply by needle entry, traumatic venous thrombosis, multiple passes with rigorous aspiration, and extraction of large amounts of tissue; these mechanisms may also be affected by the size of the needle used in the procedure [1, 3]. Baloch and LiVolsi postulated that FNAB-induced infarctions may also be affected by the biology of the lesions [2]. For example, among different types of carcinoma, Hurthle cell tumors were observed to undergo infarctions more often than other follicular lesions and papillary carcinomas, which may be caused by the differences in blood flow requirements or the microvasculature of the nodule [4].

Various rates at which thyroid nodules undergo infarction have been reported, ranging from 0 to 10%. Us-Krasovec et al. [5] did not encounter any case of infarction or tissue damage in 305 thyroidectomies with preceding fine needle biopsy. When surgery was performed within 3 months of FNAB, infarction was found histologically in 8/82 (9.8%) thyroid neoplasms, with only one case showing complete infarction [3]. Different types of thyroid neoplasms, including Hurthle cell tumors, papillary carcinomas, and follicular neoplasms have been found to undergo infarction [4]. Most cases of infarction retain some viable tissue at the periphery of the nodule that help establish the diagnosis, however, in cases of complete infarction, the tissue changes may be so extensive as to obscure the nature of a cytologically diagnosed neoplasm, making histologic confirmation difficult [3, 4].

In this case, post-operative histological examination of the tumor and tumor capsule yielded the surprising result of a completely infarcted thyroid tumor, with no residual papillary thyroid carcinoma. Although the tumor capsule retained the papillary architecture, no nuclear features typical of the papillary thyroid carcinoma were identified. Only the finding of metastatic papillary thyroid cancer in

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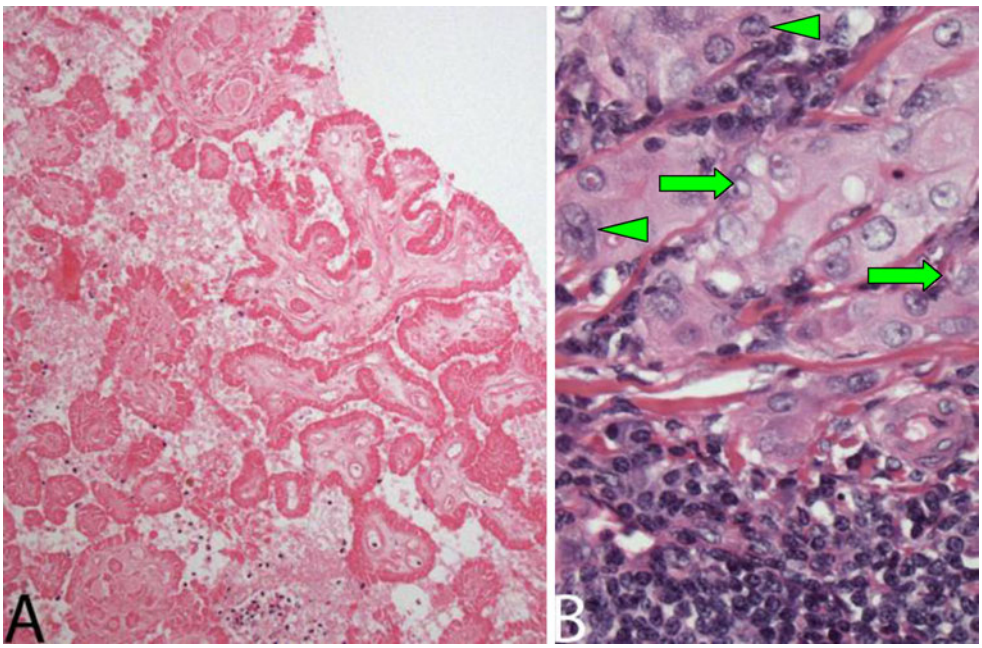

Fig. 1 **a** (Original magnification 100×) H&E-stained section of infarcted neoplasm with branching papillary structures lined by a single layer of cells that have lost their tinctorial properties. There are scattered poorly preserved cells at the bottom of **a**. **b** (Original magnification 400×) H&E-stained section of a lymph node with a metastatic deposit of papillary thyroid carcinoma showing the typical nuclear features, i.e., clearing (*top right* hand corner of panel **b**), grooves (*arrows*), nuclear overlap, enlargement, and irregular contours (*arrowheads*)

the central lymph nodes substantiated the cytologic diagnosis.

Conflict of interest There is no conflict of interest that could be perceived as prejudicing the impartiality of the case reported.

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