

## Follicular adenoma with squamous metaplasia and cystic change: report of a case with fine needle aspiration cytological and histological features

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### Abstract

Squamous metaplasia (SM) of thyroid follicular epithelium is known to occur in a variety of non-neoplastic lesions as well in thyroid neoplasms, notably papillary carcinoma (PC). In follicular thyroid tumors, on the other hand, SM is very rare. This case describes cytological and pathological findings in a follicular adenoma (FA) that presented as a cystic lesion with extensive SM. The fine needle aspiration (FNA) cytology sample in this case yielded only necrotic material from the cystic area and squamous cells, which being mostly of immature type, were not recognised as squamous in the cytological smears. The needle missed the solid (neoplastic) component of the lesion and on the whole the cytological picture was considered to be equivocal. FA can now be added to the spectrum of thyroid lesions that can show SM. Awareness of this will enable cytopathologists to consider non-papillary lesions in the differential diagnosis of thyroid nodules that yield squamous cells.

**Key words:** Follicular neoplasm, fine needle aspiration cytology, thyroid, squamous metaplasia, cystic change.

### INTRODUCTION

Squamous metaplasia (SM) of thyroid follicular epithelium has been reported to occur in a variety of non-neoplastic thyroid lesions<sup>1-5</sup> and in papillary carcinoma (PC).<sup>6</sup> It is however very uncommon in follicular neoplasms (FN) of the thyroid. Cystic change, common in PC, is also extremely rare in FN. Herein we report a case of FA showing prominent cystic change and extensive SM that led to an equivocal FNA cytological picture.

### CASE REPORT

A 38-year-old Malay female presented with a right thyroid nodule that had been present for five years. She was otherwise asymptomatic. On examination, a mobile, soft to firm, 4.5 cm right lobe nodule was found to be present. She was clinically and biochemically euthyroid and the nodule was cold on radioisotope scan. FNA was done from the nodule and smears stained with May Grunwald Giemsa. The cytological picture was equivocal and excision and histopathological examination were advised. A right lobectomy was done.

### Cytological features

Smears were pauci-cellular with bluish granular (necrotic) material in the background and syncytial and three-dimensional clusters of cells that were oval or elongated with a focal whorling pattern (Figs. 1 & 2) admixed with inflammatory cells. The cells at the margins of the clusters showed a moderate amount of basophilic cytoplasm and oval or round plump nuclei showing mild nuclear

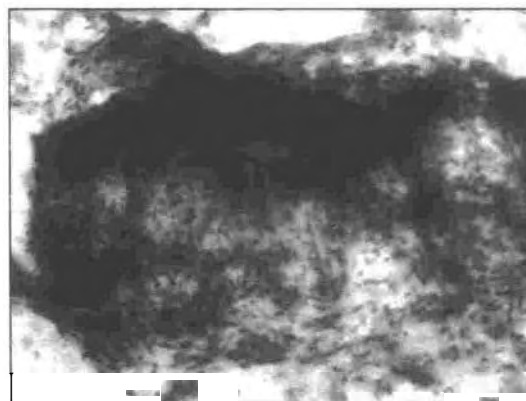


FIG. 1: Cluster of elongated cells with whorling pattern. MGG X 100

atypia. Occasional rows of plump cells were present exhibiting nuclear pleomorphism (Fig. 3). No follicular **epithelial** cells or foam cells were present. A definitive cytological interpretation could not be reached even after correlating the clinical with the cytological features.

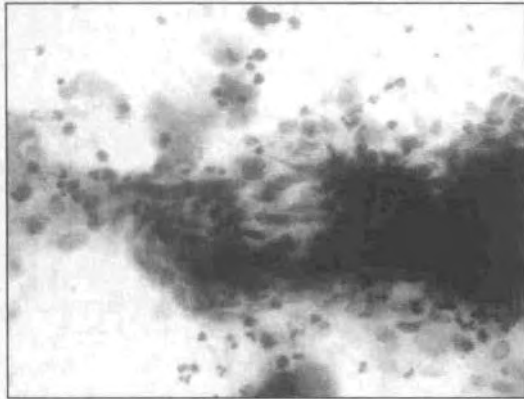


FIG. 2: Syncytial clusters of cells with ovoid or elongated nuclei and occasional mature squamous cells with pyknotic nuclei (top centre). MGG X 20 .

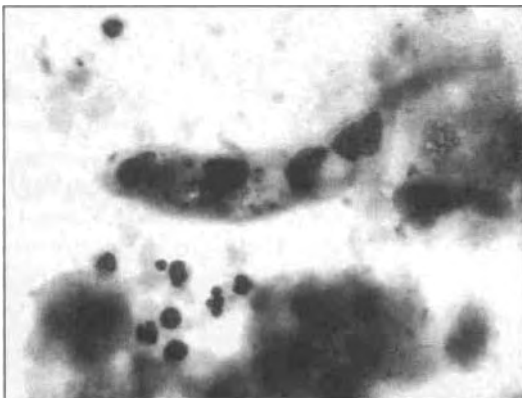


FIG. 3: Cells in a row exhibiting nuclear atypia. MGG X 400

**Histopathological features**

The excised lobectomy specimen weighed 40 gms and measured 6cm x 4 cm x 3.5 cm in size. Cut section revealed a well-encapsulated 3.8 cm diameter lesion that was predominantly cystic with a solid area near the capsule (Fig. 4). The cyst was multi-loculated and filled with necrotic granular material. The solid area was **greyish-white** and fleshy. Histopathological examination showed a follicular adenoma (Fig. 5) with extensive SM and cystic change (Figs. 6 & 7). There was no evidence of **capsular** or vascular

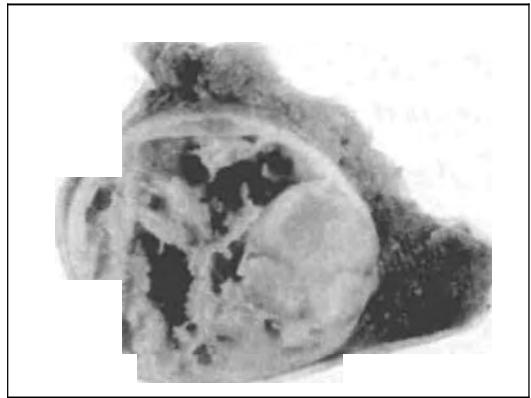


FIG. 4: Cut section of excised lobectomy specimen.

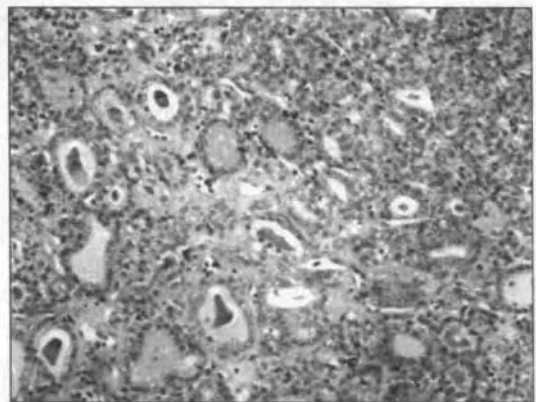


FIG. 5: Section from the nodule showing area of follicular adenoma with a predominantly microfollicular pattern. H&E X 100

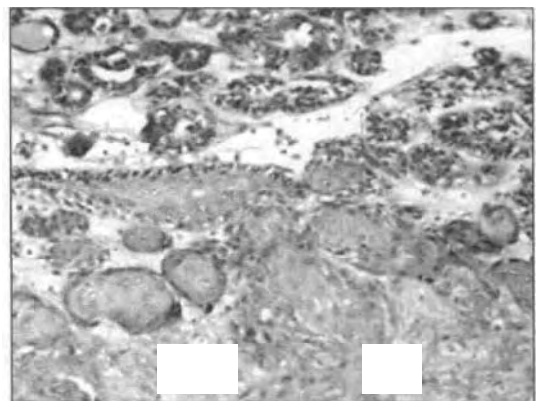


FIG.6: Follicular tumour showing extensive squamous metaplasia. H&E X 100

invasion. The thyroid was sampled thoroughly and multiple sections studied to rule out a follicular variant of papillary carcinoma.

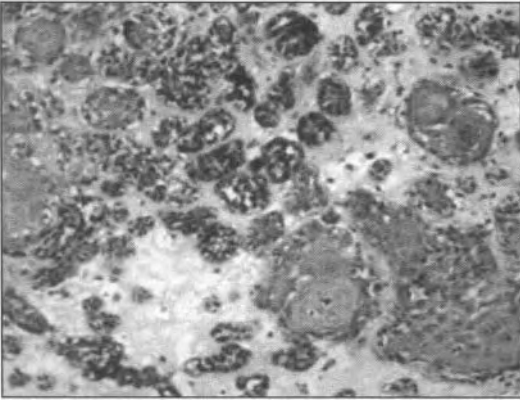


FIG.7: Follicular tumour showing extensive squamous metaplasia. H&E X 100

## DISCUSSION

SM has been reported to occur in the thyroid in nodular goitres, thyroid cysts, thyroiditis, Grave's disease and after radiation to the gland.<sup>1,3-6</sup> Rarely, squamous cells may have their origin in embryonic rests or teratomas occurring in the thyroid.<sup>1</sup> PC of thyroid is the condition that is most commonly associated with SM (which can be seen in 7-71% of PCs.)<sup>2,7</sup> PC is also the most frequent lesion contributing to squamous cells in FNA cytologic material.<sup>1</sup> Malignant squamous cells can be seen in a variety of thyroid malignancies, most of which present as clinically anaplastic growths.<sup>8</sup> Rarely malignant squamous cells may be seen in non-anaplastic tumours of thyroid that feature a combination of squamous cell carcinoma with PC.<sup>9</sup>

Cystic change is another common feature of PC, with metastatic nodal lesions often being completely cystic. FNs on the other hand rarely show SM or cystic change. The present case is unusual in that a large part of the adenoma was cystic and there was extensive SM. The needle sampling the nodule missed the solid part of the lesion and went directly into the cyst cavity aspirating the necrotic material and squamous cells. The squamous cells were mostly of immature metaplastic type, disposed in three-dimensional clusters. Some of them appeared spindle or elongated while others showed plump nuclei with focal atypical forms. As such the squamous nature of these cells was not recognised on cytological examination, perhaps because there was no cytological evidence of conditions usually associated with SM (such as PC, Hashimoto's thyroiditis, Grave's disease, or nodular goiter). On review, however, occasional mature squamous cells with polygonal

cytoplasm and pyknotic small nuclei were seen (Fig. 2) which had been missed on initial cytological examination.

Anaplastic thyroid carcinoma, especially the squamous variety, can yield pauci-cellular necrotic material and squamoid cells on FNA.<sup>2,8</sup> Although there was necrotic material in the background there was no inflammatory component and atypia of the cells was not significant enough to warrant a suspicion of anaplastic carcinoma. Besides, the clinical features of the present case did not warrant a diagnosis of an anaplastic thyroid tumor.

On review of the cytological smears (done after studying the gross and microscopical pathological features) the appearance of these cells was considered as being compatible with the cytomorphological appearance of immature, often atypical squamous cells seen in cystic lesions.<sup>3,10</sup> The SM could probably be due to the extensive cystic change occurring in the tumour or vice versa. Awareness of the fact that FA can be a part of the spectrum of thyroid lesions that show metaplastic squamous cells will alert cytopathologists into considering non-papillary lesions in the differential diagnosis of cold thyroid nodules showing SM and cystic change. Needless to say, the false negative diagnosis in the present case in which the needle missed the adenomatous component of the lesion is a well known cytological pitfall in cystic thyroid tumors" and various protocols including ultrasound guided FNA may be useful in diminishing the latter.

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