

## Thyroid papillary carcinoma infarction after fine needle aspiration

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### SUMMARY

*Complications following fine needle aspiration (FNA) are very infrequent and generally resolve spontaneously without treatment. The appearance of necrosis or infarction after FNA of the thyroid gland is an exceptional finding. An 83 year-old woman with a thyroid nodule was subjected to diagnostic FNA using a G23 needle. The patient noted a decrease in nodule size after FNA. A total thyroidectomy was performed 36 days after FNA. The cytological diagnosis was papillary carcinoma. Histology revealed massive coagulation necrosis affecting 80% of the tumor mass; the cytological diagnosis was confirmed. Iron pigment deposits were observed in the vicinity of the necrotic areas together with interstitial fibrosis; this suggested a mechanism of ischaemic necrosis but no vascular thrombosis was observed. Post-FNA tumour regression of a thyroid lesion is an infrequent finding that should be made known to clinicians and pathologists, since final diagnosis may be made difficult by the massive necrosis.*

*Key words:* Thyroid papillary carcinoma. Fine needle aspiration. Infarction.

### INTRODUCTION

The appearance of complications following fine needle aspiration (FNA) is infrequent and rarely requires treatment (1). In cases of thyroid aspiration there have been exceptional reports of spontaneously resolving subcutaneous emphysema (2) and transitory paralysis of the recurrent laryngeal nerve (3). The appearance of thyroid parenchymal hemorrhages with the formation of variable size hematomas within the puncture zone seems to be the most commonly observed complication although with the use of 0.6 mm needles such cases are currently rare. In a few cases there have been reports of thyroid nodule necrosis following FNA (4), which may complicate posterior diagnosis of the underlying lesion (5).

In the present study we describe a case of thyroid papillary carcinoma infarction after nodule FNA that diagnosed the tumor process. This infrequent observation (table I) (4,6-15) should be made known to clinicians and pathologists, as it may cause diagnostic problems resulting in a false-negative diagnosis; this may in turn lead to delays in surgery and the identification of a

thyroid neoplasm, or obscure the nature of a tumor diagnosed by FNA, rendering histological confirmation difficult.

### CLINICAL CASE

An 83 year-old woman (A.G.A., HC 457568RG) with clinical antecedents of articular tuberculosis in childhood, an appendectomy years before, and current hip arthrosis presented with thyroid goitre of several years evolution. In the last weeks the gland had increased in size; otolaryngologic exploration revealed a firm enlarged mass in the right lobe. An <sup>123</sup>I scan showed decreased uptake in a nodule within the right lobe. Ultrasound showed a solid multinodular mass almost totally occupying the right lobe, and a small hypoechoic nodule in the initial portion of the left lobe.

Analytical results: Hemoglobin 11 g/dl, hematocrit 4.1%, platelets 213,000, glucemia 148 mg/dl, Na 133.4, K: 3.28, total proteins 5g, albumin 4.4 g/dl, creatinine 3.28 mg/dl, colinesterase 2455 IU/l, GOT 34 U/l, GPT 42 U/l, LD 187 U/l, CPK 70 U/l, GGT 42 U/l, T4 11.4 µg%, T3 138 ng%, thyroglobulin 75.0 ng/ml, TSH 2.3 mU/l.

FNA of the right thyroid lobe was performed with a Cameco device and gauge 23 needle. Two

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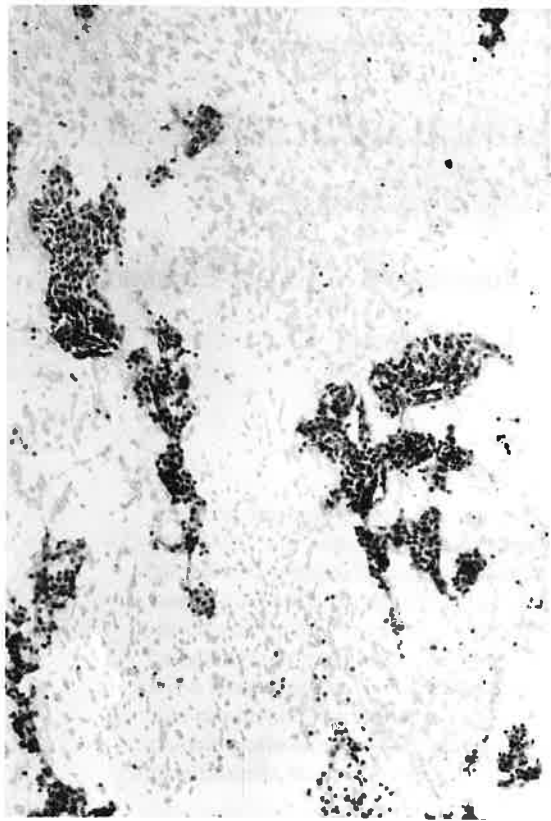


Figure 1. FNA smear of a papillary carcinoma demonstrating papillary fragments lined by uniform cells with abundant cytoplasm and rounded nuclei (200X).

consecutive aspirations were performed, obtaining abundant material. Smears of the aspirate were air dried and stained with May-Grünwald-Giemsa (Diff-Quick). Some hematoxylin-eosin and Papanicolau preparations were also made.

Cellularity was very abundant, the cells often being arranged in monolayered groups; papillary plaque-type distributions were relatively frequent (fig. 1) The cells were polygonal in shape, with abundant cytoplasm and rounded nuclei. Pleomorphism was scarce. Nuclear chromatin was fine and granular, with occasional nucleoli. Clear nuclear images in the form of intranuclear cytoplasmic pseudoinclusions were seen with relative frequency (fig. 2-inset), along with nuclei exhibiting longitudinal grooves (coffee bean). Colloid material was scarce and very dense (chewing gum). A number of background lymphocytic elements were observed, along with histiocytic cells and occasional multinuclear giant cells.

In view of these results, FNA diagnosis was compatible with thyroid papillary carcinoma.

Total thyroidectomy was performed 36 days after FNA. During this period prior to surgery, the patient herself noticed a decrease in the size of her right thyroid goitre, without pain of any other alteration. At surgery the right thyroid lobe was removed, along with

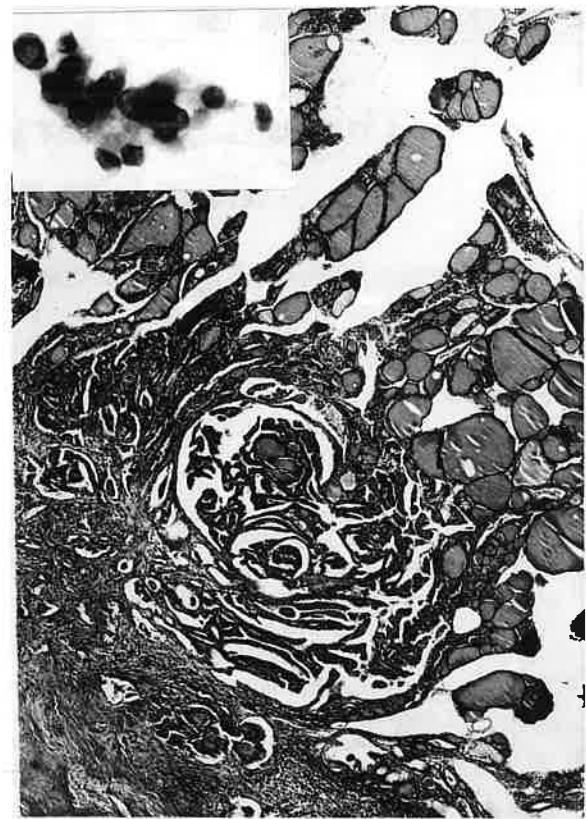


Figure 2. a) Lower left: FNA cytology. Thyroid papillary carcinoma, showing thyroid follicular cells forming a small papillary plaque with vacuoles in the form of intranuclear inclusions (H-E, 400X). b) Main picture: Histology of the papillary carcinoma present as a tumoral remnant adjacent to the necrotized thyroid nodule (H-E, 200X).

a 4x3x2.5 nodule of smooth surface and yellowish section. An extemporaneous biopsy of this nodule was performed; both frozen histological sections and imprint cytology preparations showed massive thyroid necrosis, with an almost total lack of viable cells. Paraffin-embedded material was used to establish a delayed diagnosis. Surgery was completed by removing the left thyroid lobe (3.5x2 cm), which likewise presented a nodular appearance with colloid upon section.

Histopathological study of both thyroid lobes showed multinodular colloid goitre of the left lobe, while the right lobe presented a large, almost entirely necrotic nodule (fig. 3). This nodule was surrounded by a thin fibrous capsule, with areas of both earlier and more recent hemorrhage, hemosiderine deposits and surrounding fibrotic zones. The central nodular regions were partitioned by fibrous tracts of variable thickness, with recent hematoidine deposits and older areas of iron pigmentation due to hemosiderine. Despite the coagulative necrosis a papillary pattern was observable within the nodule, although the epithelial lining appeared completely necrotized. Only in an area of the periphery of the nodule and in close proximity to it were tumoral zones seen to persist, with an arborized papillary pattern (fig. 2). Approximately 80% of the total tumor surface appeared necrotic. Careful examination of the thyroid

**Table I. Regression due to lesion necrosis after fine needle aspiration.**

Organ	Lesion type	FNA-necrosis interval (days)	Lesion size (cm)	Necrosis	Author
Thyroid	Hürtle cell tumor	10	2.5	90%	(4)
Thyroid	Follicular carcinoma	37	1.5	90%	(6)
Thyroid	Adenoma	17	1.5	reduced	(6)
Thyroid	Hürthle cell adenoma	26	5.5	total	(7)
Thyroid	Benign lesion	15	-	total	(8)
Parotid	Warthin tumor	25	2.0	total	(9)
Kidney	Adenocarcinoma	15	3.0	total	(10)
L. node	Lymphadenitis	14	1x1	partial	(11)
Thyroid	Hürthle cell tumor (12 cases)	-	-	total	(12)
Thyroid	Papillary carcinoma (2 cases)	-	-	total	(12)
Thyroid	Papillary carcinoma	17	3	90%	(13)
Thyroid	Follicular neoplasm	90	3	total	(14)
Thyroid	Hürthle cell tumor	19	2.5x2.5	subtotal	(15)
Thyroid	Sclerosis papillary ca.	24	1	total	(15)
Thyroid	Papillary carcinoma	37	4x3	80%	(*)

(\*) present description

vascular structures showed no signs of thrombosis, although the arteries presented highly evident arteriosclerotic changes, with a decrease in vessel caliber. There were no signs of associated inflammation or infection.

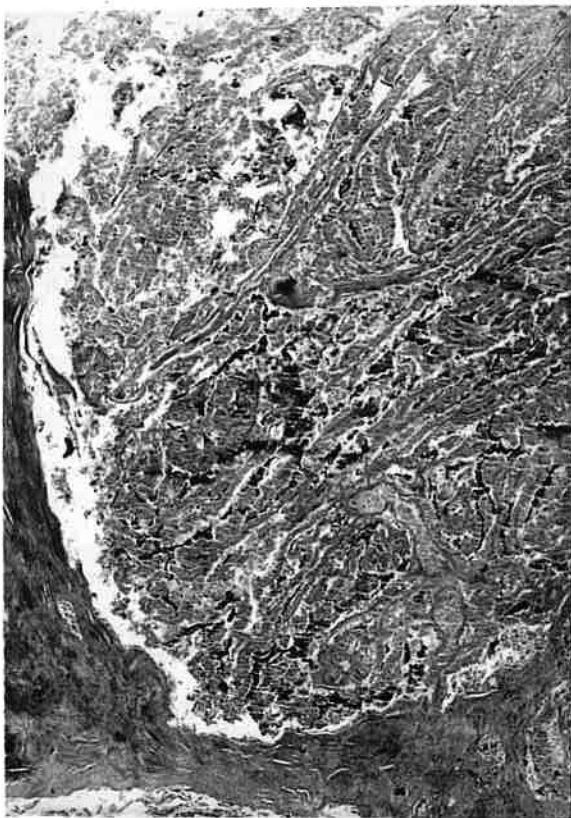


Figure 3. Thyroid nodule showing massive coagulative necrosis, together with small iron pigment deposits. Despite the evident necrosis, the neoplastic papillary pattern persists (H-E, 100X).

## DISCUSSION

In the present study massive spontaneous necrosis affecting 80% of the thyroid papillary carcinoma mass was observed. The tumor had been subjected to fine needle aspiration 37 days before, and the patient has received no medication that could account for the sudden infarction.

Such tumor infarction following FNA is very rare. To date, only 26 cases have been reported in the literature (table I) (4,6-15). Interestingly, most of these cases have involved thyroid gland aspirations, particularly Hürthle cell tumors (15 cases) (4,7,12,15) and papillary carcinomas (5 cases) (12,13,15 and present description). This post-aspiration necrosis has also exceptionally been described in organs such as the kidneys (10), parotid gland (9) and lymph nodes (11). In all cases the mechanisms responsible were unknown.

Infarction after FNA is often accompanied by patient-observable, spontaneous tumor regression, as in our case (6,7). This decrease in tumor size is occasionally preceded by painful swelling that has been attributed to intratumoral hemorrhaging (8). Indeed, in our patient extensive recent as well as old hemorrhagic areas were noted, with hemosiderine deposits and iron pigmentation along with septate fibrosis. These observations all suggest intratumoral hemorrhage, with coagulative necrosis of probable ischemic origin. On the other hand, a number of observations (6,9) suggest that tumor infarction might be caused by an interruption in vascular supply as a result of the puncture maneuver itself. As in other reports (4), we were unable to detect thromboses at any point, although a number of authors have described cases of venous thrombosis (11) of probable traumatic origin due to FNA. In our case, however, we did detect arteriosclerosis with a diminished vascular lumen, in

agreement with the advanced age of the patient. The interval between FNA and the evidence of infarction varies, although it is almost always over 10 days. Infarction often affects the entire tumor mass (7-12,14,15), even in the case of voluminous growths. As a result, practically the entire tumor or at least an extensive surface of the neoplastic nodule disappears, as was observed in our patient. This aspect is of importance, for it may imply almost total tumor regression, while at the same time intraoperative biopsy diagnosis may be considerably complicated. Hence this fact should be made known to clinicians and pathologists. It should be remembered (6) that in the case of positive FNA cytology (16,17), thyroid surgery must be performed consistently in agreement with diagnostic rationale, regardless of whether or not clinical resolution or regression of the thyroid nodule occurs (18).

#### ADDENDUM

Posterior to submitting this article, Hernández Vierna (Patología, 1993; 26:65-66) reported a case similar to our own. A 49 year-old male presented total necrosis of preatrial nodule, diagnosed 15 days before by fine needle aspiration of a Warthin's tumor, the massive necrosis prevented histological confirmation of the previous cytological diagnosis; only immature squamous metaplasia was evidenced this being a common observation in infarcted Warthin's tumors.

#### RESUMEN

La aparición de complicaciones tras una PAAF es infrecuente y éstas generalmente se resuelven sin tratamiento. En muy pocos casos se ha descrito la aparición de necrosis o infartación del tejido tiroideo tras una PAAF. Una paciente de 83 años de edad, con un nódulo tiroideo derecho, fue puncionada con una aguja calibre 23. La paciente refirió días después una disminución del tamaño del nódulo puncionado. 37 días después de la PAAF se le practicó una tiroidectomía total. El diagnóstico citológico fue de carcinoma papilar. El estudio histológico mostró una masiva necrosis de coagulación, afectando al 80% del nódulo tumoral que, efectivamente, se trataba de un carcinoma papilar. Junto a las áreas de necrosis aparecían depósitos de pigmento férrico y áreas de fibrosis intersticial, sugiriendo un mecanismo de necrosis isquémica, a pesar de no encontrarse fenómenos de trombosis vascular. La regresión tumoral postpunción de una lesión tiroidea es un hecho infrecuente, que debe ser conocido dado que el diagnóstico final de estas lesiones puede verse dificultado por la necrosis masiva.

*Palabras clave:* Carcinoma papilar de tiroides. Punción-aspiración. Infartación.

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