

## Case Report

### Diagnostic Fine Needle Aspiration in a Case of Riedel's Thyroiditis

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#### ABSTRACT

In Riedel's thyroiditis, a rare chronic inflammatory disease of thyroid gland, fine needle aspiration is usually non-diagnostic because most often only follicular cells are obtained and not the fibrous material characteristic of this type of thyroiditis. Therefore the diagnosis is often only established by histopathologic study of the surgically obtained biopsy. The illustrated case is a 46-year-old female who presented with a firm, non-mobile thyroid nodule of the left lobe. Fine needle aspiration was performed, demonstrating fragments of fibrous tissue and few inflammatory cells including neutrophils and lymphocytes, findings that could be representative of Riedel's thyroiditis. Frozen section examination during subsequent surgery and later histopathologic study confirmed the diagnosis. Fine needle aspiration of the thyroid, if successfully done, could be highly suggestive for Riedel's thyroiditis.

**Key words:** Thyroiditis, Fine Needle Aspiration, Cytology

#### Introduction

Riedel's thyroiditis, first diagnosed in 1896 (1), is a rare chronic inflammatory lesion of the thyroid characterized by dense and invasive fibrosis involving the gland and its surrounding tissue (2).

Fine needle aspiration (FNA), is generally recommended for the initial evaluation of solitary or dominant nodules of the thyroid gland. The specificity of this technique is more than 90% in most series (3, 4).

The results of thyroid FNA needs correlation with clinical findings to maximize the utility of the technique (5).

FNA of the fibrotic nodules can be a potential source of diagnostic difficulty in evaluation of thyroid masses, and may lead to aspirations that are no diagnostic, unsatisfactory, or atypical (6).

Fine needle aspiration is usually non-diagnostic in Riedel's thyroiditis because most often only follicular cells are obtained and not the fibrous material characteristic of this type of thyroiditis. As the aspiration is usually inadequate, the diagnosis is often only established by histopathologic study.

The authors here describe a case of Riedel's thyroiditis, the diagnosis of which was suggested on FNA.

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## Case report

A 46 year-old female referred with a feeling of suffocation and dyspnea from three months earlier. Clinically, left lobe was enlarged, painless but stony hard. Physical examination only revealed a localized firm fixed nodule at isthmus and left lobe of thyroid measuring 5x 5 centimeter. Other organs showed no abnormality on physical exam. She had a past medical history of cholecystectomy.

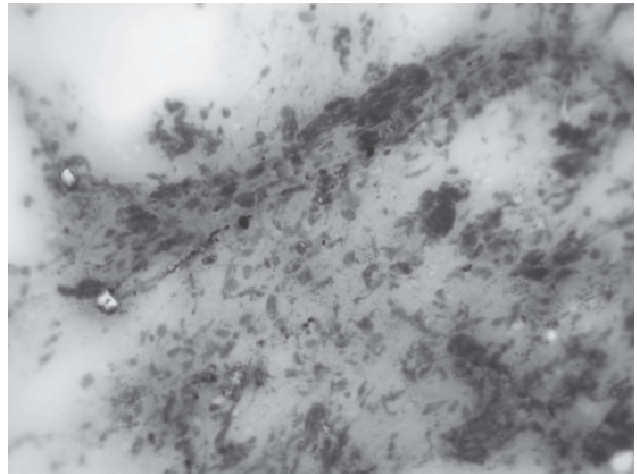
Thyroid function tests revealed total thyroxin (T4) of 7.6 microgr/dl (normal range: 4.8-13.1 microgr/dl), thyroid stimulating hormone (TSH) level of 1.5 mIU/L (normal range: 0.3-5 mIU/L). Complete blood count (CBC) showed hypochromic microcytic anemia (Hemoglobin: 9.9 gr/dl). Serum calcitonin and C - reactive protein were normal. Thyroid related autoantibodies were not assessed.

Neck ultrasonography showed a thyroid with normal size and echo, without any tumoral or cystic lesion. A well circumscribed mass with mixed-echo was detected at left thyroid lobe M: 20x17 millimeter. Neck adenopathy was not seen.

Thyroid technetium scan showed enlarged thyroid gland with a zone of absent activity in the left lobe, which corresponded to a large palpable nodule at that area. There was the impression of nodular goiter with cold nodule of the left lobe.

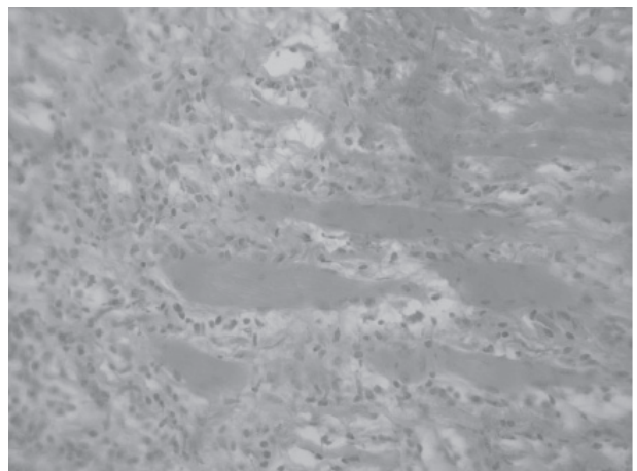
FNA of the thyroid was performed three times using 23-gauge needle. Nine air-dried and 10 immediately alcohol-fixed (in 95% ethanol) smears were prepared and stained by May-Grunwalds Giemsa (MGG) and Papanicolaou techniques respectively. The smears showed many stromal fragments containing many spindle cells and few inflammatory cells including neutrophils and lymphocytes in a bloody background. No thyroid follicular cells or colloid materials were identified (Fig. 1). Besides, no germinal center cell or Hurthle cell was identified to describe the fibrosing variant of Hashimoto thyroiditis and no multinucleated giant cell was present to support the granulomatous thyroiditis.

Combination of these findings with history and physical examination was highly suggestive of Riedel's thyroiditis.



**Fig. 1:** Fine needle aspiration demonstrated fragments of fibrous tissue and few inflammatory cells including PMN leukocytes and lymphocytes, findings that could be representative of Riedel's thyroiditis. (May-Grunwalds Giemsa staining  $\times 250$ )

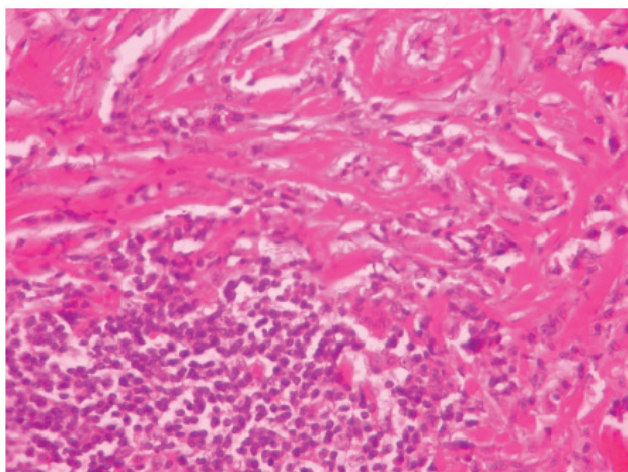
On surgery the thyroid gland was markedly fibrotic with adherence to the trachea. A biopsy of the left thyroid lobe was sent for frozen section study, which was interpreted as fibrosis and chronic inflammation and compatible with Riedel's thyroiditis (Fig. 2).



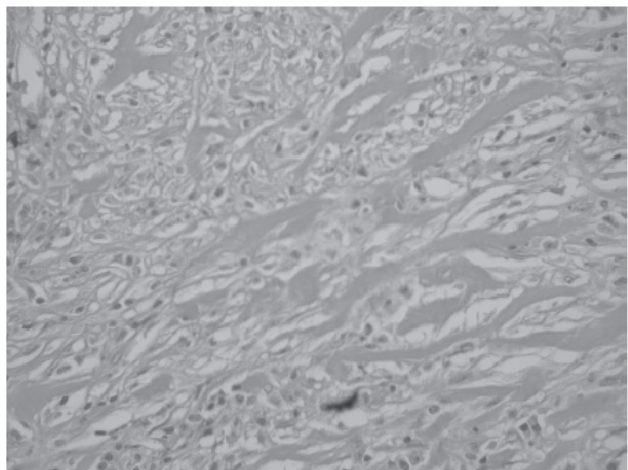
**Fig. 2:** Frozen section examination showed fibrosis and chronic inflammation, compatible with Riedel's thyroiditis. (Hematoxylin and Eosin staining  $\times 250$ )

Isthmectomy and subtotal left lobectomy was then performed. The histologic material for light microscopy consisted of a piece of irregular gray, firm tissue with tan-white, relatively avascular cut surface, that was fixed in 10% buffered formalin and embedded in paraffin. The entire specimen was submitted and 4 micrometer thick sections were stained

with Hematoxylin and Eosin. Histopathologic study showed fragments of dense hyalinized fibrous tissue in which there were multifocal patchy infiltration of inflammatory cells including lymphoplasmacells and histiocytes. Fragments of involved adjacent striated muscle fibers and adipose tissue were noted. In addition, small remnants of thyroid tissue with excess lymphoplasmacytic infiltration were evident (Fig. 3, 4).



**Fig. 3:** Histopathologic study showed dense hyalinized fibrous tissue in which there were multifocal patchy infiltration of inflammatory cells including lymphoplasmacells and histiocytes. (Hematoxylin and Eosin staining  $\times 250$ )



**Fig. 4:** Sections also revealed adjacent striated muscle fibers and adipose tissue involvement. (Hematoxylin and Eosin staining  $\times 250$ )

The patient was subsequently discharged after being treated by antibiotics and analgesics in postoperative period.

## Discussion

Riedel's thyroiditis is an extremely rare disorder that affects adult and elderly patients and shows a slight predilection for females (7, 8).

Clinically, it presents with ill-defined thyroid enlargement often associated with profound dyspnea. The lesion, which is extremely firm, binds the soft tissues of the neck and may compress the trachea. This presentation of the disease makes clinical distinction from malignancy very difficult (8, 9). The majority of the patients, as our case, are euthyroid, whereas minorities are hypothyroid (7). From the intraoperative diagnosis point of view, Riedel's thyroiditis is an important diagnostic pitfall in frozen section interpretation of thyroid mass (10).

The main histopathologic differential diagnosis is the fibrous form of Hashimoto's thyroiditis, which is limited to the thyroid, distinctly lobulated, and accompanied by extensive oxyphilic changes of the follicular epithelium (11).

Rapid enlargement of the gland, firmness, nodularity and fixation to surrounding structures may occur in inflammatory conditions, mimicking cancer, so in thyroid inflammation, such as Riedel's thyroiditis, FNA is usually carried out to exclude neoplasia (12). The findings on FNA of thyroid with inflammatory disease are non-specific. The aspirate is poorly cellular and may include a few fibroblasts and inflammatory cells. Where there is clinical suspicion, biopsy will be necessary to exclude a sclerosing malignancy of the thyroid.

The primary choice of treatment is corticosteroid therapy. If the conservative treatment fails, the surgery may become inevitable (13).

There are few published case reports that describe the FNA findings of Riedel's thyroiditis (6, 13, 14). Harigopal *et al.* reported cytomorphological features of a case of Riedel's thyroiditis in a 37 years old woman in which the FNA slides showed moderate cellularity with fragments of fibrous tissue, bland looking spindle cells and scattered inflammatory cells. They described that by clinical, laboratory and cytological criteria some one can distinguish between the main differential diagnosis of Riedel's thyroiditis, i.e. fibrosing variant of Hashimoto thyroiditis, subacute thyroiditis and malignancy (13).

Van hoeven *et al.*, also evaluated the pitfalls in



aspiration of fibrotic nodules and emphasized on the clinical history and symptomatology of the patients in addition to the FNA findings for accurate diagnosis (6).

In another study, FNA was performed on 5 out of 8 patients with Riedel's thyroiditis. FNA results were suspicious in 25%, inconclusive in 25% and inadequate specimen in 13%. They conclude that not only FNA but also intraoperative diagnosis (frozen section study) may be difficult or can not be differentiated between benign and malignant lesions (14).

Although often non-diagnostic, FNA was suggestive of Riedel's thyroiditis in the case presented here, showing many tissue fragments and few inflammatory cells including PMN leukocytes and lymphocytes, with no follicular cell or colloid material (Fig. 1). In our study, we could diagnose Riedel's thyroiditis both in FNA and frozen section slides.

This article describes the FNA findings of a case of Riedel's thyroiditis. Since the inadequate aspiration is a major problem in the diagnosis of Riedel's thyroiditis, we recommend 2 to 3 times aspiration trial with 23 gauge needle to increase the adequate rate. Besides, we emphasize that FNA together with physical examination, relevant clinical laboratory data, and radiologic findings can aid in the preoperative diagnosis of Riedel's thyroiditis.

In a patient with no other indication for surgery, this may exclude the need for surgical intervention as a mean to obtain tissue for histopathologic study and if surgical intervention is inevitable, careful examination of intraoperative frozen sections can be diagnostic.

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