

## Efficacy of fine needle aspiration cytology in the diagnosis of tuberculosis of the thyroid gland: a study of 18 cases

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### Abstract

Tuberculosis of the thyroid gland is an extremely rare condition. Amongst 1565 cases of thyroid lesions subjected to fine needle aspiration cytology (FNAC) over a period of nine years, 18 cases (1.15 per cent) were found to have cytological features consistent with tuberculosis thyroiditis. Acid-fast bacilli were isolated in all cases. The ages of the patients ranged from 36 to 52 years with a median age of 46 years: there were 12 females and 6 males. All the patients presented with painless solitary nodules of the thyroid. Three patients had concomitant cervical lymphadenopathy and four patients were known to have tuberculosis of the lungs which was being treated. Solitary nodules of the thyroid were confirmed by a thyroid scan with radioactive iodine. Fine needle aspirates from thyroid swellings showed epithelioid granulomas with necrosis in all cases. There were no false reports or complications.

It is evident from this study that FNAC is an efficient way with which to detect tuberculosis of the thyroid gland.

**Key words:** Tuberculosis; Thyroid gland; Cytology

### Introduction

The first case of tuberculosis thyroiditis was reported in 1862 (Klessen and Curtis, 1945). Since then mostly isolated cases and mainly small series of tuberculosis thyroiditis have been reported in the literature (Klassen and Curtis, 1945; Carter, 1958; Goldfarb *et al.*, 1965; Crompton and Cameron, 1969; Johnson *et al.*, 1973; Barnes and Weatherstone, 1979; Emery, 1980; Laohapand *et al.*, 1981; Liote *et al.*, 1987; Sachs *et al.*, 1988; Mondal *et al.*, 1992).

We studied 18 cases of tuberculous lesions of the thyroid gland. Our series of cases diagnosed by fine needle aspiration cytology (FNAC) is one of the largest in the literature when compared to other reports (Liote *et al.*, 1987; Sachs *et al.*, 1988; Das *et al.*, 1992).

### Materials and methods

Amongst 1565 cases of thyroid lesions subjected to FNAC, 18 cases were diagnosed as tuberculosis thyroiditis. The age of the patients in this series ranged from 36 to 52 years with a median age of 46 years: there were 12 females and 6 males. All the patients presented with solitary nodules of the thyroid. In 11 cases the right lobe was involved while in seven cases the left lobe was involved. Three patients had concomitant cervical lymphadenopathy and four patients were on treatment for pulmonary

tuberculosis but the other cases did not show any primary foci elsewhere after routine clinical investigations.

A thyroid scan with radioactive iodine ( $I^{131}$ ) was performed in all cases. All 18 lesions originated in the thyroid gland. Routine haematological investigations did not reveal any abnormalities except a raised erythrocyte sedimentation rate in four cases. Assay for the thyroid hormone showed that all patients were euthyroid.

Fine needle aspiration cytology (FNAC) was carried out as described previously (Mondal *et al.*, 1992). The lymph nodes in three patients were also subjected to FNAC. Aspiration yielded caseous material in all cases. The smears were air-dried and routinely stained with Grunwald–Giemsa stain. Part of the aspirated material was sent for bacteriological study which included Ziel–Neelsen stain, Gram stain and culture in Lowenstein–Jensen medium for acid-fast bacilli.

### Results

The thyroid scan with radioactive iodine ( $I^{131}$ ) performed in all 18 cases showed an extremely scanty, patchy, uptake by the affected thyroid nodules. The cytological study from the thyroid nodules showed groups of epithelioid cells, necrotic material with, or without, Langhans giant cells, lymphocytes and occasional neutrophils (Figures 1 and 2). Smears from the lymph nodes

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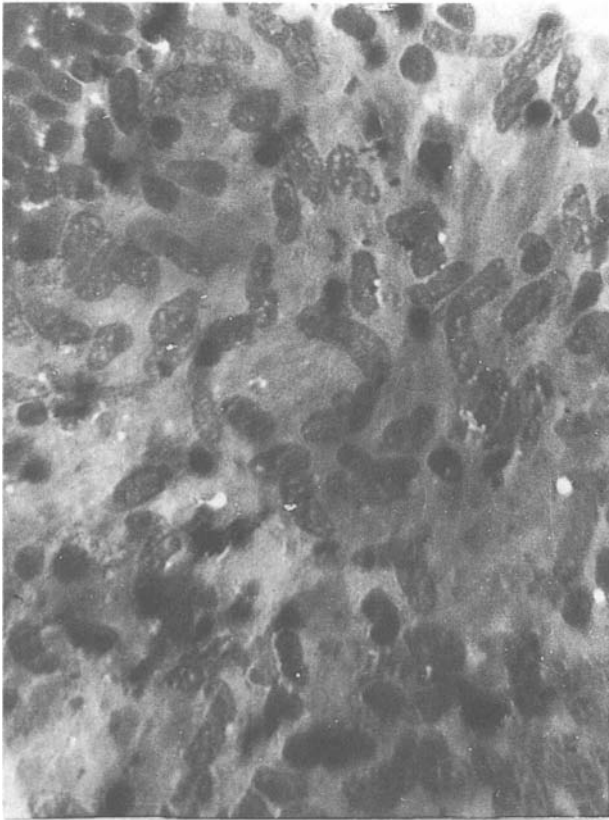


FIG. 1

Photomicrograph showing clusters of epithelioid cells with pale cytoplasm and slipper-shaped nuclei. The cytoplasm is arranged in a syncytial fashion; few lymphocytes are seen. (Grunwald-Giemsa;  $\times 400$ ).

showed a similar cytological picture. Staining for acid-fast bacilli was positive in 12 cases. Culture in Lowenstein-Jensen medium showed acid-fast bacilli in 14 cases. Four cases did not show acid-fast bacilli possibly because the patients were on treatment with anti-tuberculosis drugs for pulmonary tuberculosis. These four patients however had previously shown acid-fast bacilli in their sputum.

### Discussion

Tuberculosis of the thyroid gland is an extremely rare condition as shown by its frequency of 0.1–0.4 per cent in histologically diagnosed cases (Das *et al.*, 1992). Out of 1565 cases of thyroid glands subjected to FNAC from January, 1985 to January, 1994, 18 cases were diagnosed as tuberculous thyroiditis accounting for 1.15 per cent of the total series. The reason for the higher frequency observed in our study indicates the magnitude of this problem in India.

There are two main types of thyroid involvement by tuberculosis: (1) the diffuse miliary type which does not give rise to clinical thyroid disease in contrast to (2) focal caseous tuberculosis (Barnes and Weatherstone, 1979). The focal caseous tuberculous thyroiditis may strongly mimic carcinoma (Crompton and Cameron, 1969). Rarely tuberculous thyroiditis may present as an acute abscess (Goldfarb *et al.*, 1965) or as a diffuse enlargement causing chronic lymphocytic thyroiditis (Barnes and Weatherstone, 1979). All our cases had focal tuberculosis pre-

senting as asymptomatic solitary nodules involving either lobe of the thyroid gland. The thyroid scan with radioactive iodine proved that the nodules originated from the thyroid.

Tuberculosis of the thyroid gland is rarely found but it is not difficult to diagnose cytologically. In the present series of 18 cases, three cases had concomitant tuberculous lymphadenitis and four patients were being treated for pulmonary tuberculosis while 11 cases had no known focus of tuberculosis elsewhere in the body. A similar type of finding was reported by Das *et al.* (1992).

Other conditions which may produce an epithelioid granuloma in the thyroid are sarcoidosis (Karlsh and MacGregor, 1970) and subacute thyroiditis (Greene, 1971), but tuberculous thyroiditis can be distinguished from these lesions by the presence of caseation and demonstration of acid-fast bacilli (Barnes and Weatherstone, 1979). In the present study all the cases showed epithelioid granulomas with necrosis. Acid-fast bacilli were demonstrated from the aspirated material in 14 cases and previously in four cases (from their sputum). These cases were on treatment with anti-tuberculous drugs due to pulmonary tuberculosis when they presented with nodular swellings of the thyroid. FNAC of the thyroid was carried out three to four months after the diagnosis of pulmonary tuberculosis. It may be presumed that acid-fast bacilli could not be demonstrated from the aspirated material of the thyroid as the patients were on anti-tuberculous therapy. All 18 patients responded to anti-tuberculous therapy.

In our opinion and that of other authors (Das *et al.*, 1992) it is justifiable to accept the diagnosis of tuberculo-

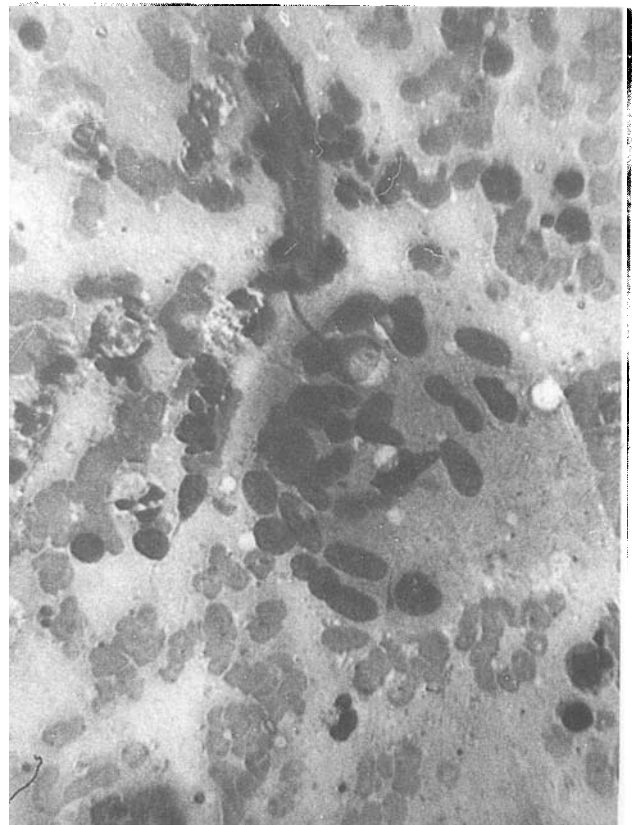


FIG. 2

Photomicrograph showing a Langhans giant cell, necrotic tissue and inflammatory cells. (Grunwald-Giemsa;  $\times 400$ ).

sis solely on cytomorphology without microbiological confirmation in countries like India, where tuberculosis is a very common disease. However for confirmation acid-fast bacilli were isolated in all our cases, as tuberculous thyroiditis is an extremely rare disease. The diagnosis is rarely made clinically. The majority of the reported cases were diagnosed either post-operatively or at autopsy (Karlish and MacGregor, 1970; Laohapand *et al.*, 1981; Liote *et al.*, 1987). Only four cases have been diagnosed before surgical intervention (Sachs *et al.*, 1988). Very little literature is available regarding diagnosis of tuberculosis of the thyroid by FNAC (Liote *et al.*, 1987; Sachs *et al.*, 1988; Das *et al.*, 1992).

The greatest benefit of FNAC is derived from the speed with which a correct diagnosis of this rare lesion is made and early treatment started.

### Conclusion

Fine needle aspiration cytology is a sensitive and specific method of diagnosing tuberculous thyroiditis. When FNA contains purulent caseous material and the cytomorphology is suggestive of tuberculosis, the aspirated material should be tested for acid-fast bacilli and cultured for mycobacteria. The test should be carried out by trained cytopathologists.

### References

- Barnes, P., Weatherstone, R. (1979) Tuberculosis of the thyroid: two case reports. *British Journal of Diseases of the Chest* **73**: 187–191.
- Carter, E. A. (1958) Tuberculosis of the thyroid. *British Journal of Surgery* **46**: 176–177.
- Crompton, G. K., Cameron, S. J. (1969) Tuberculosis of the thyroid gland mimicking carcinoma. *Tubercle* **50**: 61–64.
- Das, D. K., Pant, C. S., Chachra, K. L., Gupta, A. K. (1992) Fine needle aspiration cytology diagnosis of tuberculous thyroiditis: a report of eight cases. *Acta Cytologica* **36**: 517–522.
- Emery, P. (1980) Tuberculosis abscess of the thyroid with recurrent laryngeal nerve palsy: case report and review of literature. *Journal of Laryngology and Otology* **94**: 553–558.
- Goldfarb, M. D., Schifrin, D., Graig, M. D. (1965) Thyroiditis caused by tuberculous abscess of the thyroid gland. *American Journal of Medicine* **38**: 825–827.
- Greene, J. N. (1971) Subacute thyroiditis. *American Journal of Medicine* **51**: 97–108.
- Johnson, A. G., Philips, M. E., Thomas, R. J. S. (1973) Acute tuberculous abscess of the thyroid gland. *British Journal of Surgery* **60**: 668–669.
- Karlish, A. J., MacGregor, G. A. (1970) Sarcoidosis, thyroiditis and Addison's disease. *Lancet* **2**: 330–333.
- Klassen, K. P., Curtis, G. M. (1945) Tuberculous abscess of the thyroid gland. *Surgery* **17**: 552–559.
- Laohapand, T., Ratanarapee, S., Chantarakul, N., Vitavasiri, A. (1981) Tuberculous thyroiditis: a case report. *Journal of the Medical Association of Thailand* **64**: 256–260.
- Liote, H. A., Spaulding, C., Bazally, B., Milleron, B. J., Akoun, G. (1987) Thyroid tuberculosis associated with mediastinal lymphadenitis. *Tubercle* **68**: 229–231.
- Mondal, A., Sadhukhan, B., Roychaudhuri, B. K., Banerjee, S. (1992) Cytodiagnostic accuracy of fine needle aspiration biopsy of cold nodules of the thyroid: a study of 853 cases. *Indian Journal of Laryngology and Otology* **2**: 63–65.
- Sachs, M. K., Dickinson, G., Amazon, K. (1988) Tuberculous adenitis of the thyroid mimicking subacute thyroiditis. *American Journal of Medicine* **85**: 573–575.

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