

## Pediatric Grave's Disease – Cytological Perspective

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### Abstract

### Case Report

**Background:** Grave's disease is one of the causes of hyperthyroidism in paediatric patients presenting with goitre. The disorder is immune mediated which results from production of TSH antibodies by stimulated B lymphocytes. These immunoglobulin bind to TSH receptors and stimulate thyroid growth and thyroid hormone overproduction. Clinical presentation of Paediatric Grave's disease is enlarged thyroid gland, exophthalmos, tachycardia, tremors, sweating, irritability and weight loss. Thyroid function tests in these cases reveal decreased TSH level and high T3 and T4 levels. **Case report:** We present a case of Paediatric Graves' disease in a six year old female patient with thyroid enlargement and complain of palpitation, irritability. Thyroid function tests showed low TSH and high T3 and T4 levels. Cytological examination revealed features of Grave's disease. **Conclusion:** Fine needle aspiration cytology plays important role in diagnosis of Paediatric Grave's disease. It serves as a non-invasive and cost effective diagnostic tool in diagnosis of paediatric thyroid lesions.

**Keywords:** Grave's disease, Pediatric, clinicopathological aspects.

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## INTRODUCTION

Grave's disease is one of the causes of hyperthyroidism in pediatric patients. Hyperthyroidism is a rare childhood disorder, Grave's disease being most frequent cause. It is immune mediated disease which results from production of TSH antibodies by stimulated B lymphocytes. These antibodies bind to TSH receptors and stimulate thyroid growth and over production of thyroid hormone [1].

## CASE PRESENTATION

A six year old girl child presented with diffuse anterior neck swelling since 1 year. Patient also complained of irritability and palpitations. On clinical examination patient had exophthalmos and tachycardia. On local examination 4 x 3 cm firm, non-tender, diffuse swelling was present over anterior aspect of neck (figure 1). Swelling was moving with deglutition.

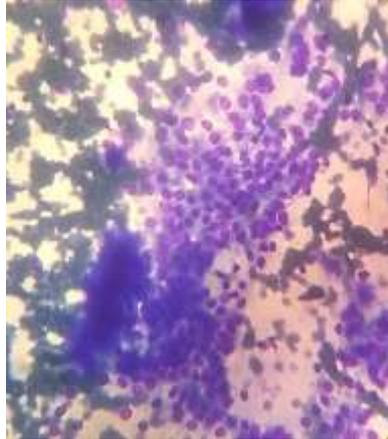


**Fig-1: Diffuse swelling on anterior aspect of neck**

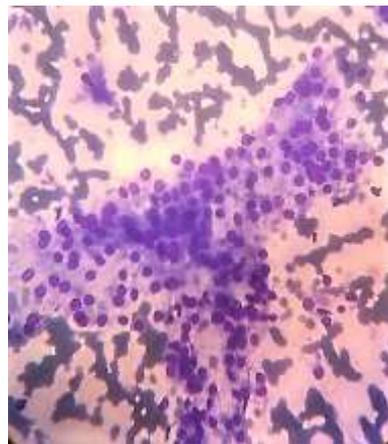
Thyroid Profile revealed raised T3 and T4 levels (T3 – 591 ng/dL, T4- 20.3 µd/dL) and reduced TSH level (below 0.01µUI/mL).

FNAC findings showed follicular cells in sheets as well as small clusters (figure 2) The cells

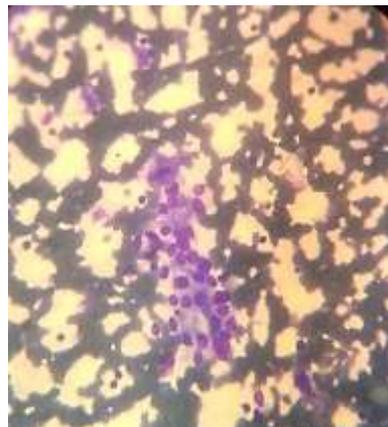
showed slightly enlarged nuclei with scanty to moderate cytoplasm showing “ Fire Flares “(figure 3). Within the follicular cells was seen entrapped thick colloid material. Background showed few scattered lymphocytes and RBCs (figure 4).



**Fig-2: Follicular cells in sheets and small clusters with entrapped thick colloid (100 xs, Geimsa)**



**Fig-3: Follicular cells showing slightly enlarged nuclei with fire flares (100 xs, Geimsa)**



**Fig-4: Follicular cells in sheets, background showing scattered lymphocytes and RBCs (100x, Geimsa)**

Considering these features the case was reported as pediatric Grave’s disease – Category II (Benign) – According to Bethesda System of reporting thyroid cytopathology.

## DISCUSSION

Grave’s disease is a rare disease in pediatric age group accounting for 1 -5 % of all patients with Grave’s disease. The incidence is thought to be rising

and is about 0.1 / 100000 in a year in young children [2]. Grave's disease is the main cause of hyperthyroidism in pediatric age group and it can lead to interference with growth and development if not diagnosed and treated earlier. This is an autoimmune disorder which results from thyrotropin receptor stimulation by autoantibodies [2].

Grave's disease was first described by Robert Grave and this clinical syndrome of Goiter, palpitations and exophthalmos was identified by him in 1835. Girls are affected 4-5 times more than boys [3]. Our case was also a six year old girl child.

Differential diagnoses of thyrotoxicosis in children include autoimmune neonatal hyperthyroidism due to passage of maternal antithyroid antibodies, thyroiditis, exogenous causes, toxic adenomas, TSH secreting pituitary tumors and selective pituitary resistance to thyroid hormones [1]. Various cytomorphological features like fire flares/marginal vacuoles, soap bubbles, colloid suds in MGG stained smears are helpful in diagnosis of pediatric Grave's disease [4, 5].

The treatment options for Grave's disease are antithyroid drugs, radioactive Iodine and near total thyroidectomy. If not treated the disorder can lead to permanent brain damage due to craniosynostosis, failure to thrive and neuropsychological deficits in young children [6, 7]. Indications for radical treatment in children are antithyroid drug toxicity, relapse after drug treatment and lack of compliance.

## CONCLUSION

FNAC plays an important role in diagnosis of pediatric Grave's disease. It serves as a non-invasive and cost effective diagnostic tool in diagnosis of pediatric thyroid lesions. FNAC in evaluation of pediatric Grave's disease is found to be superior when used along with USG, TFT and estimation of antithyroid antibodies.

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