

## Case Report

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# Papillary thyroid carcinoma with neck metastasis in a 6 year old child: A case report

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### Abstract:

*Thyroid cancers account for 0.5-3.0% of all childhood malignancy. But these cancers are extremely rare in paediatric age group before the age of 6 years. Although the disease is biologically more aggressive in children when compared with adults, the prognosis is better in several series. We report and discuss a case of 6 years old child with papillary thyroid carcinoma, which is the youngest reported case in Bangladesh.*

**Key words:** Thyroid gland, nodule, papillary carcinoma

### Introduction:

The incidence of thyroid cancer is 9/100 000 per year.<sup>1</sup> It is more common (approximately twice common) in women than in men and increases with age.<sup>2</sup> Thyroid nodules seem

to be rare disorders in children and adolescents, although thyroid cancers are extremely rare in the pattern of thyroid pathologies, especially at ages younger than 5 years.<sup>3</sup> Thyroid cancers occur in 0.5-3.0% of all paediatric malignancies.<sup>4</sup> Regarding pathogenesis of goitre, TSH is the dominant hormonal regulator of thyroid gland growth and function, a variety of other growth factors and substances, most produced locally in the thyroid gland, also influence on those processes. These include insulin-like growth factor 1 (IGF-1), epidermal growth factor, transforming growth factor- $\beta$  (TGF- $\beta$ ), endothelins, and different other cytokines.

### Case Report:

We present a 6 year old female child brought to the hospital with swelling of the left anterior-lateral aspect of the neck for 6 months (Fig. 1). The swelling was painless and almost pea size initially but had rapidly increased in size in the past one month. The swelling was 2-3 cm in size in its greatest axis in left side of neck, mobile, firm in consistency, smooth surfaced and it moved with deglutition. There were also 2 palpable cervical nodes in level III and IV, each of which was about 1x1cm in size, mobile, firm

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in consistency. There was no family history of any cancers, nor a history of exposure to radiation. USG of thyroid showed a hypoechoic nodule arising from the left lobe of thyroid almost 1.0 x 0.5 cm in size. Rest of the thyroid gland was normal. There were 3 cervical nodes about 0.5 cm in size also noticed. USG guided FNAC from the thyroid nodule showed papillary carcinoma of thyroid gland. FNAC from the clinical palpable nodes also showed metastatic papillary carcinoma. The Serum TSH,  $T_4$ ,  $T_3$  were within normal limits. Chest X-Ray, haematological profile, were within normal limits. Child under went surgery and a total thyroidectomy with left sided selective neck dissection was done

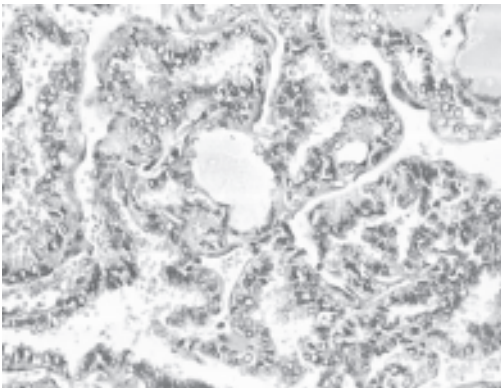
(Fig. 2). The post operative period was uneventful. The excised specimen measured 3.0x2.0x1.0 cm total thyroidectomy sample containing both lobes and isthmus and seven lymph nodes. The cut surface of the larger lobe showed a 1.0 x 0.5 cm grey white nodule. Section of the nodule showed a papillary carcinoma with few foci of psammomatous calcification (Fig. 3). Lymphovascular invasion is present. The tumour has reached very close to the thyroid capsule. But surgical margins were free of tumour. Sections of all seven lymph nodes showed metastatic papillary carcinoma (Fig. 4). The patient underwent radioiodine ( $^{131}\text{I}$ ) ablation. Presently the child is on thyroid hormone supplementation and is disease free at 4 months follow up.



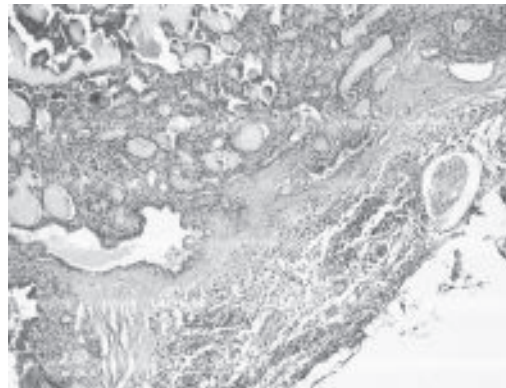
**Fig. 1**



**Fig. 2**



**Fig. 3**



**Fig. 4**

**Discussion:**

Incidence of thyroid cancer in paediatric age group is 0.5-3.0%.<sup>4</sup> The peak age of presentation is 7 to 12 years and about 2/3rd of cases are among girls.<sup>5</sup> The occurrence of carcinoma thyroid after Chernobyl nuclear accident among 0-6 years children was 2-12/105 persons during the year 1986-2002.<sup>6</sup> The possible causative factors for carcinoma of thyroid in paediatric age group is radiation (>150cGy), average latent period is 7 year). RET/ PTC rearrangement is the most common genetic alteration associated with radiation related papillary thyroid cancer.<sup>7</sup> Genetic factor (RAS proto-oncogene in 20% papillary carcinoma of thyroid),<sup>8</sup> familial (in case of medullary carcinoma) or disorder of immune system, TSH receptor activating gene mutation are also considered as the causative factors. Familial factors are autosomal dominant and as no such family history are present in this case. 70% of cases of papillary carcinoma of thyroid in children occur below the age of 7 years.<sup>9</sup> The most common presentation is cervical lymphadenopathy or firm palpable thyroid nodule with or without cervical lymphadenopathy.<sup>10</sup> 6% of papillary carcinoma presents with metastasis to lung or upper mediastinal lymphadenopathy. But it almost never occurs in absence of cervical lymphadenopathy. There is more chance of recurrent laryngeal nerve injury and hypocalcaemia in total thyroidectomy. <sup>131</sup>I whole body scan should be performed approximately 6 weeks after the initial thyroid resection, followed by therapeutic dose of radionuclide (<sup>131</sup>I) to ablate residual tissue and treat residual metastatic disease.<sup>11</sup> Radioiodine ablation has been shown to decrease risk of local recurrence. A higher rate of recurrence has seen in children who didn't receive initial post operative (<sup>131</sup>I) ablation than in those who did.<sup>12</sup> After radio ablation most investigators recommend

exogenous thyroid hormone to suppress TSH mediated stimulation of the gland. This child also received ablation followed by thyroid hormone supplementation. In follow up, thyroglobulin has been shown to be a useful marker for residual or metastatic thyroid cancer. Plasma level should be measured yearly and an elevated value should raise the suspicion of recurrence.<sup>13</sup> The overall survival of papillary thyroid cancer in paediatric age group is 98%.<sup>14</sup>

**Conclusion:**

Papillary thyroid cancer in children may have a very aggressive initial presentation like local lymph node metastases and relatively high rate of distant metastases in comparison to adult patients. Although there is high recurrence rate, the mortality rates are still low. Any child with clinically palpable thyroid swelling should be viewed with suspicion and worked up with possible malignancy. Long term follow up is needed to know the current knowledge and clinical behaviour of this malignancy.

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