Primary Thyroid Cancer as late effect of childhood cancer treatment: A case series from a tertiary care centre

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Introduction

Advance in treatment modalities for childhood malignancies has improved the survival. There is an increased risk of subsequent primary thyroid cancer among the survivors of malignant disease in childhood particularly in those who have had radiotherapy to the head, neck, or upper thorax. We hereby present case series of 5 patients who developed thyroid cancer after childhood cancer therapy.

Index Case

A 16 year old female referred to adolescent late effects Clinic. She was diagnosed with Acute lymphoblastic leukaemia aged 2 years. She was initially treated with chemotherapy in accordance with UK ALL protocol. She had remission until aged 5 when she had relapse. She had allogeneic Bone marrow transplant with cyclophosphamide & total body irradiation priming. She had developed growth hormone deficiency & Global Left ventricular dysfunction secondary to her treatment. During her follow-up in late effects clinic, she was noted to have neck lump which had increased in size over 6 months. Her Ultrasound of neck confirmed 4 cm nodule in her left lobe and Fine needle aspiration cytology confirmed papillary thyroid carcinoma. She underwent total thyroidectomy followed by Radio-iodine thyroid ablation. She is currently in remission on a suppressive dose of levothyroxine.

Summary of case series (Table)

Total number of 5 patients diagnosed and treated for thyroid cancer over 4 years in a tertiary care centre late effect adolescent clinic. Duration between treatment for primary malignancy and diagnosis of secondary malignancy was 11.4 years (7-15 yrs.). All five patients were treated for haematological malignancy in their childhood. Mean age at diagnosis of primary malignancy was 8.8 years (1-16 yrs.). Four out of five were female and one was male.

Summary of the case series

	First Malignant Neoplasm						Secondary Thyroid Carcinoma			
	Age at Diagnosis	Gender	Diagnosis	Radiation	Chemotherapy	Interval	Histology	LNMX	Treatment	Outcome
1	2 years	F	Acute lymphoblastic leukaemia	Total body irradiation	UK ALL XA	15 years	Papillary Thyroid carcinoma	+	Thyroidectomy /Level 6 discn RAI ablation	Complete remission
2	1 year	F	Acute lymphoblastic leukaemia	Cranium 18 Gy	UK ALL XA	11 years	Papillary Thyroid carcinoma	-	Thyroidectomy /Level 6 discn RAI ablation	Complete remission
3	16 years	M	Hodgkin's Lymphoma (3B)	Cranium/spine 24/15Gy	UK ALL XA (1999) ALL97199 (2001) FLAG/IDA (for relapse)	7 years	Papillary Thyroid carcinoma	+	Thyroidectomy /Level 6 discn RAI ablation	Complete remission
4	10 years	F	Acute lymphoblastic leukaemia	Total body irradiation	UK ALL XA Allogeneic Bone marrow transplant (cyclophosphamide)	12 years	Papillary Thyroid carcinoma	+	Thyroidectomy /Level 6 discn RAI ablation	Complete remission
5	15 years	F	Acute Myeloid Leukaemia	Total body irradiation	UK ALL XA Allogeneic Bone marrow transplant (cyclophosphamide)	12 years	Papillary Thyroid carcinoma	+	Thyroidectomy /Level 6 discn RAI ablation	Complete remission

Three of these needed Bone marrow transplant (2-allogenic and 1 sibling) under cyclophosphamide cover and Total body irradiation with 14 Gy priming. One had cranial irradiation with 18 Gy and patient with lymphoma had cranial and spine irradiation (24/15 Gy). Two of these self presented with neck lump, one with lymphoma presented with cervical lymphadenopathy, remaining two were diagnosed incidentally on imaging. Four patients had local lymph node involvement. All five patients had total thyroidectomy with level 6 neck dissection followed by Radio-iodine ablation of thyroid. Patient with lymphoma needed level 2a,3 and 4 dissection on left side with bilateral level 6 dissection.

Discussion

Thyroid cancer is an important but manageable delayed effect of radiotherapy for childhood cancer**.** Papillary thyroid cancer is commonest type of thyroid cancer in these group of patients. Such tumours do not appear to be different from spontaneously occurring papillary cancers diagnosed at the same age. If detected early most cases can be cured & mortality risks are low. Infants and young children are at especially high risk of radiogenic thyroid cancer, and females are at higher risk than males. The excess risk typically appears 5±10 years after radiotherapy and, for clinical purposes, should be assumed to persist for the remainder of life among persons with intact thyroid glands.

Conclusions

Standard long-term follow-up of patients for detection of thyroid cancer should include thyroid ultrasound & measurement of TSH in survivors of any cancer during childhood who received radiotherapy to the thorax or head and neck region

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