Case Report

A Rare Case of Primary Leiomyosarcoma of Thyroid in a Young Adult with Literature Review

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ABSTRACT

Primary leiomyosarcoma of the thyroid gland (PLT) is an extremely rare neoplasm and still rarer is its occurrence in younger age group. It is one of the most aggressive malignancies with high metastasizing potential. They can be difficult to diagnose on histopathology and can mimic anaplastic or medullary thyroid carcinoma. Only 22 cases of PLT have been reported in the literature and the youngest patient was a 39 years old male. However we report a case of PLT in a 23 years male, being the youngest patient reported till date (23rd in series). He presented with progressively increasing anterior neck swelling since two months and underwent total thyroidectomy. Histopathology and immunohistochemistry showed features suggestive of leiomyosarcoma of the thyroid gland. Two months later, the tumour recurred at subglottis for which he underwent total laryngo-pharyngectomy followed by radiotherapy. Patient was on regular follow up for one and half year with no recurrence and lost to follow up later.

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Introduction

Primary leiomyosarcoma of thyroid gland (PLT) is an extremely rare neoplasm and it represents 0.014% of primary thyroid cancers. It usually occurs in older individuals with a slight female preponderance and its exact etiology is not known.[1, 2] Two paediatric cases of thyroid leiomyosarcoma have been reported, none of them were primary and one was associated with Epstein Barr Virus. PLT is a malignant mesenchymal tumour arising from smooth muscles of the intraglandular blood vessels and is composed of spindle shaped cells which are positive for smooth muscle markers on immunohistochemistry (IHC). It has aggressive nature with low survival rates and needs to be differentiated from medullary and anaplastic thyroid carcinomas, solitary fibrous tumours (SFT) and other thyroid tumours including metastatic leiomyosarcoma (LMS).[2]Surgery is the main stay of treatment; however prognosis remains poor despite therapy. [1, 2]To the best of our knowledge only 22 cases of PLT are reported till date, and none from India. We hereby report a unique case of PLT in a young male with subsequent recurrence at subglottis.

Case Report

A 23 years male presented with progressively increasing neck swelling since two months which recently became painful and was associated with dysphagia, voice hoarseness and weight loss. There was no past history of radiation exposure, surgery or mass elsewhere in the body. Patient did not have signs and symptoms of hypothyroidism or hyperthyroidism. General and systemic examinations were unremarkable. Local examination revealed a hard anterior neck swelling, moving with deglutition with mobile vocal cords on indirect laryngoscopy. Haematological and biochemical investigations, T3, T4, TSH, thyroid antibody, serum calcium and parathyroid hormone, were within normal limits. USG showed a hypoechoic mass in left thyroid lobe. Fine needle aspiration cytology (FNAC) requested was inconclusive due to scanty material showing very occasional lymphocytes without any thyroid follicular cells. Patient underwent total thyroidectomy. Gross examination showed an enlarged left lobe with a firm white mass (figure 1a) which on microscopy showed pleomorphic spindle cells (figure 1b) showing hyperchromatic nuclei, brisk mitosis (5/high power field) with atypical mitotic figures without any necrosis. Focal infiltration of thyroid parenchyma (figure 1c) and skeletal muscle at the periphery was also seen (figure 1d). Multiple sections studied did not show any epithelial differentiation or vascular invasion. On IHC, tumour cells were positive for vimentin, desmin and smooth muscle actin (figure 1e) and negative for pankeratin, chromogranin, Bcl-2, CD 117 and TTF-1. Right lobe and isthmus were unremarkable. Thus the diagnosis of PLT was made. Patient was stable in the immediate post-operative period and his routine investigations were within normal limits. He later developed mild vocal cord paresis for which speech therapy was advised. Patient was discharged on fifth postoperative day without any fresh complaints. Subsequently he was referred to a cancer hospital and after an asymptomatic period of two months; follow up CT scans showed a mass in paratracheal and retrotracheal region (figure 2) with no evidence of cervical lymphadenopathy or lung metastases. Subsequently a total laryngo-pharyngectomy was performed and a diagnosis of high grade leiomyosarcoma was made on histopathology for which patient underwent radiotherapy. He did not show any recurrence till 18 months but was lost to follow up later on.

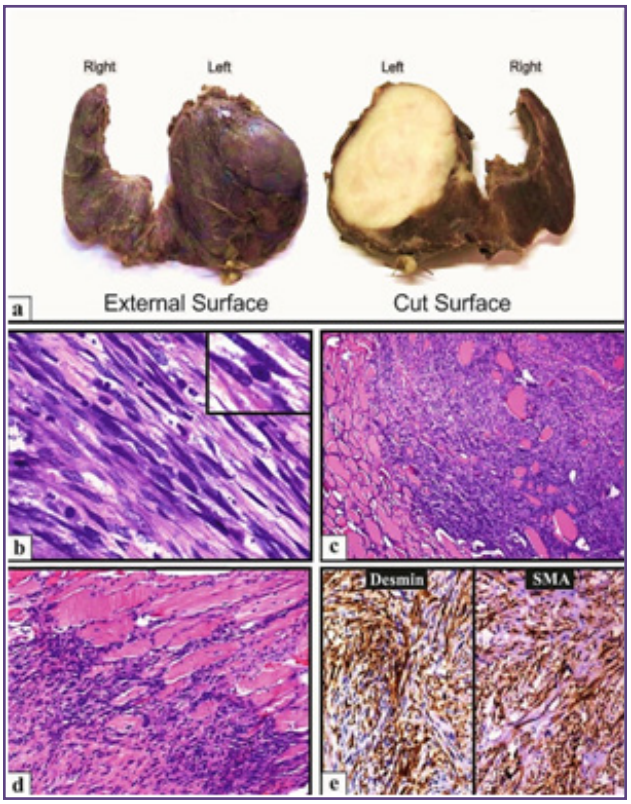

Fig. 1: (a)Bosselated left lobe without any capsular breech or soft tissue attachment on external aspect and a well circumscribed, grey white fleshy mass with areas of whorling on cut surface, (b) Tumour cells with eosinophilic cytoplasm, cigar shaped, blunt-ended hyperchromatic nuclei, high nuclear:cytoplasmic ratio and brisk mitosis (inset) (HE x 400); (c) Interlacing fascicles of spindle shaped cells invading the thyroid parenchyma (HE x 100); (d) Invasion of adjacent skeletal muscle fibers (HE x 100); (e) Tumour cells showing strong positivity for desmin and smooth muscle actin (SMA) (x100)

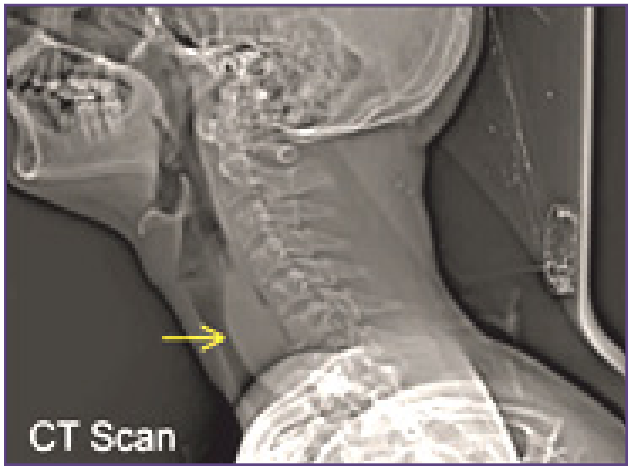

Fig. 2: Elongated mass in retro tracheal region, indenting the posterior tracheal wall and oesophagus (arrow).

Discussion

Thyroid tumours represent most common malignancies of the endocrine system.[1] Thyroid carcinomas are more common while stromal tumours are relatively rare which include smooth muscle tumour, angiosarcoma, peripheral nerve sheath tumour, paraganglioma, SFT, follicular dendritic cell tumour, Langerhans cell histiocytosis and spindle cell tumour with thymus like differentiation. PLT is rare and its differential diagnoses includes other primary tumors like medullary and anaplastic carcinoma, SFT, spindle cell tumor with thymus like differentiation and other primary as well as metastatic sarcomas (specially LMS) from elsewhere in the body. Diagnosis of thyroid sarcoma should only be made when there is a complete lack of all epithelial differentiation with definite evidence of specific sarcomatous differentiation. [3] Our case did not show any epithelial component in spite of extensive sampling and was negative for pankeratin on IHC with strong positivity for smooth muscle actin (SMA), vimentin and desmin, thus favoring the diagnosis of LMS. Nevertheless further IHC done was negative for TTF-1, chromogranin and Bcl-2, thus ruling out the possibility of other stromal tumours.

Thyroid gland can be secondarily involved by loco-regional spread of LMS arising from head and neck soft tissue or by distant metastasis. Surgical explorations and pathological examinations are indispensable for correct identification of primary site of tumour. It is believed that approximately 1% of thyroid cancers are metastatic and in autopsy series, thyroid metastases are seen in up to 24% of patients of cancer in general.[4] In our case points favoring primary thyroid tumour over metastasis included absence of any significant previous history or mass elsewhere in the body, along with clean resection of the specimen without any adhesions and no capsular breach on gross examination except a focus of skeletal muscle invasion seen only on microscopy. Moreover, metastases are usually multiple in numbers while our case showed a solitary lesion confined to the thyroid.

First case of PLT was described in 1969 by Adachi et al which showed metastasis to the heart and brain.[2]Only 22 cases have been reported in the literature till date, which are summarized in Table 1 along with our case. [1,2,4-9] On analyzing, we can see that more than 50% (n = 12) of patients are females (male: female ratio 3:4). Their ages range from 23 to 90 years, with the mean age of 60.1 years in males and 68.7 years in females. Majority of the patients are in the seventh decade (n=7), only four patients are younger than 50 years of age, our patient being the youngest. Duration of symptoms available ranges from few days to seven months and many have history of rapidly increasing mass (n=10). Primary complaint of neck mass was present in all the patients along with various other symptoms, commonest being hoarseness of voice, dysphagia and dyspnea. Thyroid function tests available in 12 cases[1-2, 4-6]were within normal range as in our case. FNAC details were available in five cases, of which one was suspicious for malignancy[2], two reported as spindle cell/mesenchymal malignancy[1, 6]while two other were inconclusive[5]similar to our case.

Both gross as well as microscopic details were available in 12 cases. Grossly tumour ranged in size from 1.9 to 16 cm, more commonly involving the left lobe with either an irregular/well demarcated intra-thyroidal nodule or completely replacing the entire lobe as in our case. Rest of the gross features along with microscopy were also similar except the vascular invasion, which was seen in 5 cases but was not observed in our patient. IHC available in 18 cases, including our case, were positive for vimentin and SMA, with or without desmin positivity (focal or diffuse) and few also showing positivity for caldesmon (not performed in our case) and epithelial markers were negative in all cases.

Data regarding metastasis and/or local recurrence was available in 16 cases (Table 1) of which 13 (seven males, five females, gender not known in one) had metastasis, commonest being in lung followed by liver and bone. The age of these patients ranged from 43 to 83 years with variable duration (few weeks to 47 months) between first presentation and occurrence of metastasis. Thus a wide inter-patient variability regarding clinical presentation was noted with no definite age or gender predilection. Also no definite correlation between the tumour size and metastasis was observed as both large (case 19) as well as smaller (case 21) tumours showed metastasis within few

weeks irrespective of their sizes. Local recurrence was observed in three including our case which showed spread to subglottic region.

Follow up details regarding survival and deaths were available in 19 cases (Table 2); age and sex details were not available in one. Thirteen patients succumbed of which 10 died within six months, suggesting a very poor survival with a fatal outcome. Most (9/10) of them were elderly (seventh decade or above) and showed no definite gender predilection (six females, four males) for aggressive behavior. Longer survival (more than one year) was noted in seven, of which three patients survived for four to five years (case no 6, 13 and 18). One of them was a 72 years female, which had metastasis at 47 months, succumbed to death 51 months post surgery. The other patient was a 65 years male with no recurrence and metastasis at 60 months post surgery and third patient was relatively young male (39 years), who survived at 48 months without any recurrence and metastasis. In addition, two other young patients (case no 19 and 23), who developed metastasis within few weeks, also survived for about one year. Thus it may be possible that men affected at a relatively younger age can have better survival and prognosis. This needs to be investigated in future by studying much larger series.

Table 1: Review of literature.

Case No	Age- years	Sex	Dura-tion	Presenting complaints	Size	Lobe	Metastasis / local recurrence
1[1]	77	M	NA	RIM, dysphagia, dyspnoea	6.5cm	Rt.	Lung mets-bilateral
2[2]	90	F	NA	RIM, dyspnoea, TO	NA	NA	NA
3[2]	66	F	NA	RIM	NA	Lt.	NA
4[2]	65	F	2 mth	RIM	NA	NA	NA
5[2]	43	M	NA	NM	NA	NA	Lung mets, local recurrence
6[2]	39	M	4 mth	NM, hoarseness	3.5cm	Rt.	At 48 mth-no mets
7[4]	58	F	NA	NM	NA	NA	NA
8[4]	83	F	NA	NM, Lt. arm pain	NA	Lt.	Adjacent vertebrae mets
9[4]	72	F	2mth	RIM (painful), skin fistula	8.5cm	Lt.	NA
10[5]	63	F	3mth	RIM, dysphagia, TO, weight loss, odynophagia	7cm	Lt.	At 2 mth-lung, 5 mth- liver, bone, peritoneal mets
11[5]	56	M	4mth	RIM, hoarseness, dysphagia	3cm	Lt.	At 8 mth-lung mets
12[7]	64	F	NA	NM	NA	NA	Lung, liver mets
13[8]	65	M	5mth	NM, Lt.arm pain	16cm	Lt.	At 60 mth-no mets
14[9]	74	F	NA	RIM	12cm	NA	NA
15[9]	82	M	1 mth	RIM, hoarseness, tracheal deviation	5.5cm	Rt.	Recurrence at submandibular region
16[9]	NA	NA	NA	NM	NA	NA	Disseminated mets
17[9]	54	F	NA	NM	3.5cm	NA	At 15 mth-no mets
18[9]	72	F	7 mth	NM	3cm	Rt.	At 47 mth-bone mets
19[9]	45	M	3mth	RIM, TO, weight loss	9cm	Lt.	At few weeks-lung mets
20[9]	83	M	NA	RIM, dysphagia	5.5cm	NA	At few weeks-lung mets
21[9]	68	M	few days	NM, hoarseness	1.9cm	Lt.	At few weeks-lung mets
22[9]	64	F	NA	NM	7.5cm	Rt.	At 2 mth-lung, at 5mth-liver, peritoneal mets
23(our case)	23	M	2mth	NM, dysphagia, hoarseness	5.5cm	Lt.	At 3.4 mth- mets to subglottis region

Abbr. –F-female, Lt-left, M-male, mets-metastasis, mth-months, NA-not available, NM-neck mass, RIM-rapidly increasing mass, Rt.-right, TO-tracheal obstruction

Table 2: Survival and Death (n=19).

Case No	Age- years	Sex	Follow up
14[9]	74	F	Death within 1mth of presenting
1[1]	77	M	Death within 1.3mth post surgery
9[4]	72	F	Death within 2mth post surgery
8[4]	83	F	Death within 2mth post surgery
12[7]	64	F	Death within 3mth post surgery
20[9]	83	M	Death within 3mth of presenting
15[9]	82	M	Death within 4mth of presenting
22[9]	64	F	Death within 5mth post surgery
10[5]	63	F	Death within 5mth post surgery
5[2]	43	M	Death within 6mth post surgery
11[6]	56	M	Death within 8mth post surgery
21[9]	68	M	Death within 18mth post surgery
18[9]	72	F	Death within 51mth post surgery
19[9]	45	M	Alive at 11mth post surgery
17[9]	54	F	Alive at 15mth post surgery
6[2]	39	M	Alive at 48mth post surgery
13[8]	65	M	Alive at 60mth post surgery
16[9]	NA	NA	Lost to follow up -after 12m (Alive at 12 mth)
23 (our case)	23	M	Lost to follow up-after 18m (Alive at 18 mth)

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Competing Interests
None Declared

Reference
1. Conzo G, Candela G, Tartaglia E, Gambardella C, Mauriello C, Pettinato G, et al. Leiomyosarcoma of the thyroid gland: A case report and literature review. OncolLett 2014; 7(4):1011-4.
2. Bertelli AA, Massarollo LC, Volpi EM, Ueda RY, Barreto E. Thyroid gland primary leiomyosarcoma. Arq Bras Endocrinol Metabol 2010; 54(3):326-30.
3. Hedinger C, Williams ED, Sobin LH. Histologic typing of thyroid tumors. In: World Health Organization International histologic classification of tumors. 2nd ed. Berlin: Springer; 1988. pp. 13–5.
4. Amal B, El Fatemi H, Souaf I, Moumna K, Affaf A. A rare primary tumor of the thyroid gland: report a new case of leiomyosarcoma and literature review. DiagnPathol 2013; 27;8:36.
5. Mansouri H, Gaye M, Errihani H, Kettani F, Gueddari BE. Leiomyosarcoma of the thyroid gland. ActaOtolaryngol 2008; 128(3):335-6.
6. Ege B, Leventoğlu S. Primary leiomyosarcoma of the thyroid. J Korean Surg Soc 2013; 85(1):43-6.
7. Tanboon J, Keskool P. Leiomyosarcoma: a rare tumor of the thyroid. EndocrPathol 2013; 24(3):136-43.
8. Mouaqit O, Belkacem Z, Ifrine L, Mohsine R, Belkouchi A. A rare tumor of the thyroid gland: report on one case of leiomyosarcoma and review of literature. Updates Surg 2014; 66(2):165-7.
9. Thompson LD, Wenig BM, Adair CF, Shmookler BM, Heffess CS: Primary smooth muscle tumors of the thyroid gland. Cancer 1997; 79: 57987.