CASE REPORT

A large, locally aggressive giant cell tumour arising from the laryngeal cartilage: A Rare Case Report

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Abstract

Giant cell tumour is a growth predominantly found in long bones of the body. Giant cell tumour has a rare occurrence in the head and neck. A case of a 31 year old male with no known comorbidities at the ENT Department, Shifa International Hospital, Islamabad presented with anterior neck swelling and hoarseness of voice. Patient was diagnosed as having Giant Cell Tumour of Larynx (GTCL) proven on FNA cytology and post-operative biopsy. GCTL is an uncommon entity with only 45 reported cases in the world.

Keywords: Giant Cell Tumour, Laryngeal Cancer, Thyroid Cartilage, Laryngectomy.

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Introduction

Giant cell tumour was first reported in bones by Cooper in 1818; predominantly affecting the epiphyses of the long bones in the body.[1] It commonly affects young adults between the age group of 20 to 40 years. GCT accounts for 20 percent of all the biopsied benign bone tumours and between 4 to 9.5 % of all the bone tumours. Giant cell tumour of the larynx was first described by Wessely in 1940 and is a very rare entity.[2] Hoarseness of the voice and anterior neck swelling are the common initial presenting complaints of GCT. The case of this 31 year old male patient is presented along with a review of literature of the previously reported 45 cases.[1-4]

Case Report

A 31 year old male reported to the ENT out patient department of Shifa International Hospital Ltd, Islamabad in August, 2022 with the presenting complaints of painless neck mass for the past 5 to 6 months with associated hoarseness of voice. Patient had no complaints of pain, dysphagia or odynophagia. There was no history of Radiation exposure, alcohol consumption or smoking. Physical examination revealed a 3.5 cm round swelling slightly left to anterior midline of the neck corresponding to the area of thyroid cartilage with reddish discolouration of overlying skin (Figure 1a). A Computerized Tomography Scan (CT) neck was done which showed a well defined rounded heterogeneously enhancing soft tissue dense mass with lobulated margins centered at left thyroid lamina with extension into supraglottic part of larynx. There were internal arch like calcification and cervical lymphadenopathy suggestive of neoplastic etiology (Figure 1b and 1c). On Magnetic Resonance Imaging (MRI) Scan a large altered MR signal intensity mass lesion appearing hypo-intense on T1 sequence and intermediate on T2 and STIR sequence was seen. The lesion showed post contrast enhancement and was located on left half of larynx with epic centre at the level of thyroid cartilage and few enlarged lymph nodes were also seen at Ia, Ib and II level of cervical lymph nodes. A Fine Needle Aspiration Cytology (FNAC) of the lesion was performed which showed spindle cells with some overlapping, nuclear chromatin appeared homogenous and mitosis was not seen. Osteoclasts like giant cells were seen in background with haemorrhage suggestive of Giant cell tumour. Lab workup done showed normal triiodothyronine(T3), thyroxine (T4) and thyroid stimulating hormone(TSH) levels and normal total serum calcium levels. Intact parathyroid

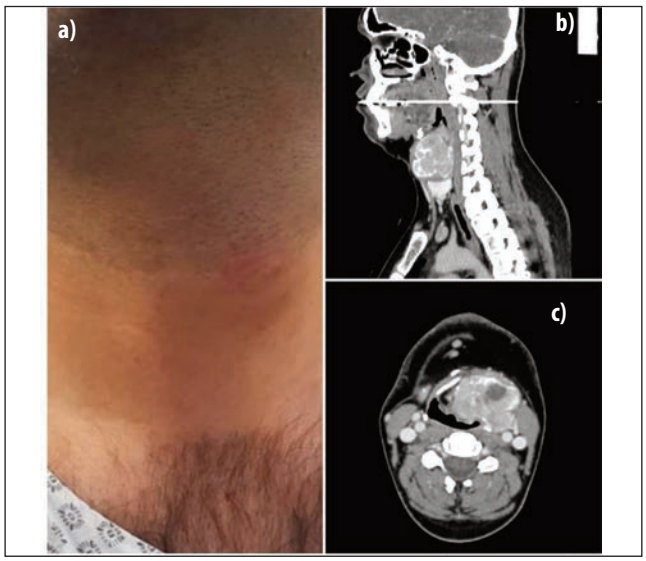

Figure-1: a) Anterior Neck swelling with reddish discoloration of overlying skin. b) Sagittal view on CT scan. c) Transverse view on CT scan.

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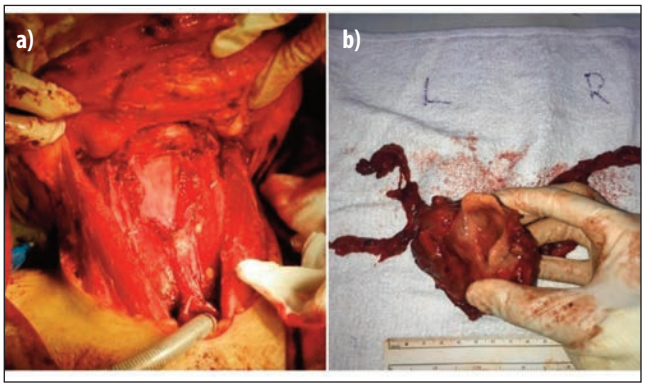

Figure-2: a) Intraoperative image during laryngectomy. b) Larynx with large tumor.

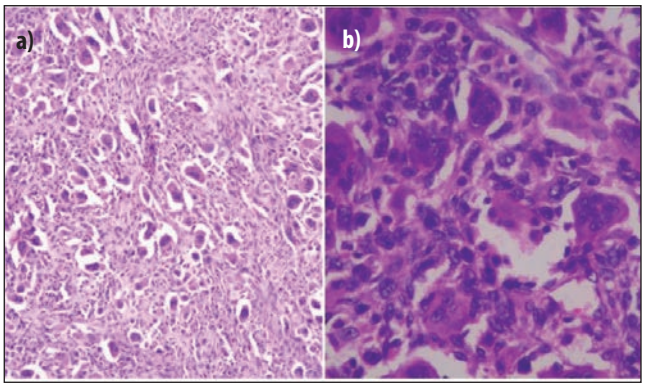

Figure-3: a) Intraoperative image during laryngectomy. b) Larynx with large tumor.

hormone (PTH) levels were slightly raised with a value of 77.8pg/mL. The case was discussed in a Multi-disciplinary Tumour board meeting which advised in favour of surgical intervention. Patient was advised and was subjected to total laryngectomy with bilateral staging lymph node dissection (Figure 2a) due to the large size and locally destructive nature of the mass. The larynx was removed intra-operatively which had a tumour size of 5.0x 5.0 x 4.5 cm (Figure 2b), however, cervical lymph nodes were negative for malignancy. A biopsy of the larynx was done to confirm the type of tumour. The biopsy showed spatially distributed multinucleated Giant cells with intervening mononuclear cells showing irregular grooved nuclei (Figure 3a and 3b) which confirmed the diagnosis of Giant cell tumour of Larynx. The case was again discussed in the multidisciplinary tumour board which advised no further chemo or radiotherapy but close routine follow up to check for any recurrence of the growth. The patient remained stable postoperatively and was discharged home; he received no adjuvant chemotherapy or radiotherapy. On one year follow up there was no evidence of recurrence of the tumour.

Discussion

Our patient was a middle aged male who presented with symptoms of hoarseness of voice and anterior neck swelling which are a pointer for laryngeal cancer. He underwent a CT and MRI scan which showed a large laryngeal mass, FNAC and post operative biopsy confirmed the diagnosis of Giant cell tumour of larynx. Giant cell tumour of larynx is a rare entity, In our review of Literature we shortlisted a total of 45 previous cases reported Table 1,[4-37] with the first case reported by Wessely in 1940 and the last case was reported by Anandani in 2021. We excluded the cases that were not primarily arising from the cartilaginous framework of the larynx such as the cases reported by Coyas A et al, Acikalin RM et al. and Saud MRM et al. have been excluded due to the tumour not arising primarily from the cartilaginous framework of the larynx.[38-40]

Giant cell tumour is a bone tumour primarily affecting the epiphyses of long bones in knee joint. Occurrence in head and neck region is a rare entity with only a few cases reported. When present in the head and neck region cases have been reported to involve hyoid bone, ethmoid bone, temporal bone, sphenoid bone or cartilage of larynx. Giant Cell tumours comprise 4 % of all the primary bone tumours and of these only 2% are found in the head and neck region.[26,31,34] According to our literature search Giant cell tumour of thyroid is more common in males as compared to females with a ratio of 10.5:1, whereas Giant cell tumour collectively is more common in females as compared to males.[3,22,33] There is no documented association with alcohol, smoking or prior radiation exposure, in our review only 16 cases have documented prior radiation exposure, use of tobacco or alcohol; out of the 16 cases only 2 patients had a history of smoking.[16,32] Only 1 patient had prior history social drinking.[36] Among the reported cases of Giant cell larynx, 35 (76%) arose from the thyroid cartilage followed by 9 (19.5%) from cricoid cartilage and only 2 (4.3%) from the epiglottis.[2-35] The initial symptoms reported are a neck mass with associated hoarseness of voice, dyspnoea or dysphagia.[28] Radiological findings of Giant cell tumours of larynx show them to be encapsulated, having a round shape and ballooning out from the cartilage with calcification and bone formation, contrast enhancement is seen and destruction of cartilage and surrounding structures and extension into soft tissue. Differentiation by radiographic imaging between GCT of larynx with other pathologies such as aneurysmal bone cyst is difficult hence biopsy and histological examination can be used to reach a definitive diagnosis along with imaging. Differential diagnosis includes giant cell reparative granuloma, brown tumour of hyper-parathyroidism, foreign body reaction, osteosarcoma and carcinoma with giant cells among others.[9,22] Giant cell tumour of larynx has a low malignant potential and none of the patient with complete tumour resection had

Table.

#	Year of presentation	Primary Site of Tumor	Age (years)	Gender	Treatment	Risk Factor	Disease Recurrence	Reference
1	1940	Cricoid Cartilage	51	Male	Radiotherapy	Not Available	Not Available	Wessely[2]
2	1951	Thyroid Cartilage	35	Male	Partial Laryngectomy+Radiotherapy	Not Available	No Recurrence	Federova[5]
3	1952	Cricoid Cartilage	40	Male	Total laryngectomy+Radiotherapy	Not Available	No Recurrence	Wagemann[33]
4	1958	Cricoid Cartilage	32	Male	Tumor Excision+Radiotherapy	Not Available	No Recurrence	Perrino[6]
5	1966	Thyroid Cartilage	52	Male	Total Laryngectomy	Not Available	Not Available	Kaliteevskii and Korol'kova[7]
6	1968	Thyroid Cartilage	50	Male	Radiotherapy	Not Available	No Recurrence	Pohl[8]
7	1969	Epiglottis	50	Male	Not Available	Not Available	Not Available	Kohn[33]
8	1971	Thyroid Cartilage	53	Male	Partial Laryngectomy	Not Available	No Recurrence	Rudert[9]
9	1972	Thyroid Cartilage	26	Male	Total Laryngectomy	Not Available	No Recurrence	Hall-Jones[10]
10	1973	Thyroid Cartilage	47	Male	Tumor Excision	Not Available	Not Available	Goto and Nakashima[11]
11	1974	Epiglottis	60	Male	Partial Laryngectomy	Not Available	No Recurrence	Kotarba and Niezabitowski[12]
12	1975	Cricoid Cartilage	35	Male	Tumor Excision+Radiotherapy	Not Available	No Recurrence	Ribari et al[13]
13	1976	Cricoid Cartilage	40	Male	Tumor Excision+Radiotherapy	Not Available	No Recurrence	Kubo et al.[14]
14	1988	Thyroid Cartilage	28	Male	Tumor Excision	Not Available	No Recurrence	Borghese et al.[19]
15	1992	Cricoid	55	Female	Total Laryngectomy	Not Available	Not Available	Badet et al.[15]
16	1993	Thyroid Cartilage	42	Male	Total Laryngectomy	Smoker, Alcohol and Radiation Exposure history Not Available	No Recurrence	Murrell and Lantz[16]
17	1994	Thyroid Cartilage	23	Male	Partial Laryngectomy	Not Available	No Recurrence	Martin et al.[17]
18	1994	Thyroid Cartilage	60	Male	Total Laryngectomy	Not Available	Not Available	Miyata et al.[18]
19	1997	Thyroid Cartilage	35	Male	Total Laryngectomy	Not Available	No Recurrence	Werner et al.[19]
20	1997	Thyroid Cartilage	39	Male	Total Laryngectomy	Not Available	No Recurrence	Paik et al.[20]
21	2000	Thyroid Cartilage	31	Male	Partial Laryngectomy	Non Smoker, Non Alcoholic	No Recurrence	Hinni[21]
22	2001	Thyroid Cartilage	37	Male	Radiotherapy+Chemotherapy (Cytoxan)	Non Smoker, Non Alcoholic, No Radiation Exposure	No Recurrence	Wieneke et al.[22]
23	2001	Thyroid Cartilage	26	Male	Total Laryngectomy	Non Smoker, Non Alcoholic, No Radiation Exposure	No Recurrence	Wieneke et al.[22]
24	2001	Thyroid Cartilage	62	Female	Total Laryngectomy	Non Smoker, Non Alcoholic, No Radiation Exposure	No Recurrence	Wieneke et al.[22]
25	2001	Thyroid Cartilage	53	Female	Tumor Excision	Non Smoker, Non Alcoholic, No Radiation Exposure	No Recurrence	Wieneke et al.[22]
26	2001	Thyroid Cartilage	40	Male	Tumor Excision	Non Smoker, Non Alcoholic, No Radiation Exposure	Not Available	Wieneke et al.[22]
27	2001	Cricoid Cartilage	37	Male	Tumor Excision	Non Smoker, Non Alcoholic, No Radiation Exposure	No Recurrence	Wieneke et al.[22]
28	2001	Cricoid Cartilage	57	Male	Radiotherapy	Non Smoker, Non Alcoholic, No Radiation Exposure	No Recurrence	Wieneke et al.[22]
29	2001	Thyroid Cartilage	44	Male	Total Laryngectomy	Non Smoker, Non Alcoholic, No Radiation Exposure	No recurrence	Wieneke et al.[22]
30	2004	Thyroid Cartilage	49	Male	Partial Laryngectomy	Not Available	Not Available	Wong et al.[23]
31	2007	Thyroid Cartilage	31	Male	Partial Laryngectomy	Not Available	No recurrence	Nishimura et al.[24]
32	2007	Thyroid Cartilage	53	Male	Tumor excision	Not Available	Not Available	Chang et al.[25]
33	2008	Thyroid Cartilage	53	Male	Partial Laryngectomy	Not Available	No recurrence	Zheng-Ping et al.[26]
34	2012	Thyroid Cartilage	39	Male	Partial Laryngectomy	Non Smoker, Non Alcoholic, No Radiation Exposure	No recurrence	Le et al.[27]
35	2013	Thyroid Cartilage	38	Male	Denosumab+Partial Laryngectomy	Not Available	Still under treatment	Derbel et al.[28]
36	2013	Thyroid Cartilage	65	Male	Partial Laryngectomy	Not Available	No recurrence	Lv et al.[29]
37	2013	Thyroid Cartilage	34	Male	Partial Laryngectomy+ Chemotherapy(adriamycin+ cisplatin/methotrexate/ifosfamide)	Not Available	No recurrence	Vivero et al.[30]
38	2014	Thyroid Cartilage	39	Male	Tumor Excision	Not Available	Not Available	Chunling et al.[31]
39	2014	Thyroid Cartilage	40	Male	Total Laryngectomy	Smoker, Exposure to wood smoke.	No Recurrence	Leon-Medina et al.[32]
40	2014	Thyroid Cartilage	59	Male	Total Laryngectomy	Not available	No recurrence	Nota et al.[33]
41	2015	Cricoid Cartilage	76	Female	Tumor Excision	Non Smoker, Non Alcoholic	No recurrence	Swanson and Brown[34]
42	2015	Thyroid Cartilage	46	Male	Partial Laryngectomy + Denosumab	Non Smoker	Was on denosumab, No recurrence reported	Yancoskie et al.[4]
43	2016	Thyroid Cartilage	53	Male	Total laryngectomy	Not available	No recurrence	Lida et al.[35]
44	2017	Thyroid Cartilage	31	Male	Total Laryngectomy	Non Smoker, Social drinker, No occupational Exposure	No recurrence	Andrew Ardnt et al.[36]
45	2021	Thyroid Cartilage	23	Male	Total Laryngectomy	Non Smoker, No occupational Exposure	No recurrence	Garima M. et al.[37]
46	2022 (Present Case)	Thyroid Cartilage	31	Male	Total Laryngectomy	Non Smoker, Non Alcoholic, No occupational Exposure	No recurrence	Present Case

recurrence of disease. Therefore Surgical intervention solely proves to be a good therapeutic approach.[22]

Conclusion

Giant cell tumour of larynx is a rare entity with very few reported cases. The tumour has low malignant potential but due to local infiltration and airway obstruction total or partial laryngectomy remain the treatment of choice but these procedures have an effect on morbidity of the patient. Rare Giant cell tumour should be on the list of potential pathologies when encountering a patient with suspected laryngeal malignancy.

Consent: An informed consent for reporting of this case in scientific literature has been taken from the patient.

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Conflict of Interest: None.

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Author Contribution:

UR: Data acquisition, drafting, final approval
HW: Data acquisition, revision, final approval
SSA: Primary surgeon of the case, data acquisition and patient consent, critical analysis and revision, final approval.
ZH: Primary pathologist of the case, acquisition of pathology images, critical analysis and review, final approval.
MS: Data acquisition, reviewing, final approval.
All authors agreed to be accountable for all aspects of the work.