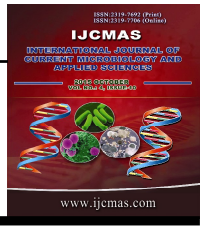
Int.J.Curr.Microbiol.App.Sci (2015) 4(10): 792-799

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 4 Number 10 (2015) pp. 792-799**
http://www.ijcmas.com



Case Study

Osteosarcoma of Larynx – A Rare Entity

Bakshi Jaimanti[1*] and Sawant Parag[2]

[1]Additional Professor, Department of Otolaryngology &Head Neck Surgery, PGIMER, Chandigarh, India
[2]Senior Resident, Department of Otolaryngology& Head Neck Surgery, PGIMER, Chandigarh.
Postgraduate Institute of Medical Education and Research, Chandigarh, India
**Corresponding author*

Keywords

Osteosarcoma, Larynx, Lung, Laryngectomy, Thyroidectomy

A B S T R A C T

A 57 year old male presented with symptoms of upper airway obstruction and was found to have submucosal mass occupying entire endolarynx. Repeated biopsies were required to identify it as sarcoma of larynx. Patient was treated with total laryngectomy with total thyroidectomy. Postoperative histopathology was osteosarcoma of larynx and he subsequently received chemotherapy and radiotherapy. Patient was free of disease at 7 months follow up. Review of literature revealed only 23 such cases. 29 % of patients need multiple biopsies to diagnose it as osteosarcoma of larynx. Surgery is used as primary modality of treatment followed by postoperative radiotherapy/ chemotherapy. 75% patients develop recurrence and 54% patients die by average of 10. 7 months due to distant metastasis. Osteosarcoma of larynx is a rare and aggressive malignancy of the larynx. Diagnosis is usually delayed due to multiple biopsies required. Patients need multimodal therapy consisting of surgery followed by radio-chemotherapy (Kassir *et al.*, 1997).

Introduction

Sarcoma constitutes less than 1% of laryngeal cancers (Berge *et al.,* 1998). Laryngeal osteosarcoma is an extremely rare disease. The diagnosis of osteosarcoma is made by identification of an osseos matrix i.e. osteoid and / or bone, produced by malignant cells.

At times the osteoid may be present only in small amounts making the histological diagnosis difficult or impossible with small biopsy samples or frozen section. This often leads to treatment dilemma. The primary treatment is complete surgical excision. Additional radiotherapy and chemotherapy is also tried due to aggressive nature of this neoplasm (Dahm *et al.,* 1978).

Only 23 cases have been published in the literature. Herein, we report another case of osteosarcoma of the larynx and also review the clinicopathological features of this rare malignancy of larynx.

Case presentation

A 57 year old male presented to a tertiary care hospital with respiratory difficulty for 1 month and noisy breathing for 4 days. On attempting indirect laryngoscopy examination patient was found to have dirty, greyish, slough covered mass occupying the laryngeal inlet completely and the vocal cords could not be identified separately from the mass.

Patient was in biphasic stridor. Patient immediately underwent emergency tracheostomy under local anaesthesia. On subsequent detailed clinical evaluation patient was found to have history of hoarseness of voice for 10 months. Also minimal difficulty in swallowing solids for preceding 2 months was present. Patient was a non-smoker, non-alcoholic and had no other addictions or prior radiation exposure. On examination patient had diffuse widening of laryngeal framework. No cervical lymphadenopathy was present. Patient had undergone laryngoscopy evaluation and biopsy of mass under general anaesthesia twice previously. Histopathology of second biopsy had been reported as benign fibromyxoid tumour. Review of these histopathology slides was done in the tertiary care hospital. It was reported as suggestive of angiomyxoma.

In the tertiary care hospital he underwent laryngoscopic evaluation and biopsy under general anaesthesia. It revealed a growth involving laryngeal surface of epiglottis, bilateral false cords, and bilateral arytenoids. The growth filled the endolarynx completely.

On retrograde endoscopy via tracheostoma the growth was found to be reaching inferiorly up to the level of upper end of stoma. The histopathology was reported as sarcoma -not otherwise specified. MRI scanning of the neck showed a well defined heterogeneously enhancing mass filling the laryngeal lumen in supraglottis, glottis and subglottis causing marked luminal compromise. Vocal cords were not seen separately from lesion. No evidence of extralaryngeal extension was seen (Figure 1). USG abdomen and X ray chest were found to be normal. Thus with a preoperative diagnosis of sarcoma of larynx patient underwent total laryngectomy with total thyroidectomy with primary tracheoesophageal puncture and voice prosthesis insertion under general anaesthesia. Laryngeal specimen showed a dirty grey ulceroproliferative growth filling the whole endolarynx arising from bilateral false cord, true cords, arytenoids, interarytenoid area, subglottis and trachea till second tracheal ring. Thyroid and cricoid cartilage were involved grossly by the mass. However thyroid gland was found to be grossly normal.

Few subcentimetric lymph nodes were found on right tracheoesophageal groove largest measuring 1 x1 cm. There were no postoperative complications. Histopathology report diagnosed it as osteogenic sarcoma of larynx with all margins of resection found to be free of tumour (Figure 2 & 3). Patient was subsequently given 3 cycles of chemotherapy with cisplatin and Adriamycin, followed by 66 grays of radiotherapy to neck. The patient was free of disease at 24 months postoperatively and doing well.

Discussion

Osteosarcoma of larynx was first described in 1942 by Jackson *et al.* (2002). It can primarily arise in larynx or may metastasize to larynx from osteosarcoma elsewhere in body. Primary Osteosarcoma of larynx is a rare entity with only 23 cases being reported in literature till date (Kassir *et al.,* 1997).

Summary of the cases is shown in the table.

AUTHOR	AGE/ SEX	PAST HISTORY	NO. OF BIOPSIES	TREATMENT	RECURRENCE	OUTCOME
Sheen et al	56/M	RT 32 years prior for nasopharyngeal ca, RT 16 years prior for gingival ca	1	TL	recurrence 9 months,	Death at 21 months locally extensive disease
Sanaat et al	71/M	Smoking 30 pack yrs	1	TL	multiple osseous, lung metastasis at 8 months	death at 1 year due to bone, pulm mets
Dahm et al	79/M	Smoking 40 pack yrs	4	TL	disseminated lung metastasis at 2 months,	death at 3 months
Mottola et al	56/M	-	1	TL+Chemotherapy (ifosfamide,farmarubicina)	lung metastasis 3 months,	death at 3 months
Athre et al	69/F	Smoking +, Chemoradiotherapy 4.5yrs prior for supraglottic Ca	Multiple	TL+ total thyroidectomy+ total pharyngectomy with gastric pull up	lung metastasis 10 months,	death 10 months
Gorenstein et al	75/M	-	1	Wide field laryngectomy +radical neck dissection	regional and distant metastasis	death at 14 months
Topalogu et al	80/M	Smoking 35 years	1	Extended TLl	-	disease free at 16 months
Berge et al	60/F	-	2	Excision of cricoid mass and reconstruction with tracheal advancement, later on completion laryngectomy with bilateral selective neck dissection + hemithyroidctomy	-	disease free at 44 months
Murat Ulusan et al	59/M	Smoking +, RT 5 years prior for Ca in situ	1 795	TL and subtotal thyroidectomy	-	disease free at 8 years

		true cords				
Morley et al	62/M	-	1	Subtotal laryngectomy + radiotherapy 42 Gy	Invasion of lower border of tracheostomy 2 weeks postoperatively	death 3 months
Arslan et al	69/M	-	Multiple	TL, Chemotherapy for locoregional recurrence	neck tumor, enlarged lymph nodes 5 months postoperatively, lung metastasis	DNA
Rydzewski et al	DNA	Past history of tuberculosis	Multiple	TL, Criles operation for locoregional recurrence, Chemotherapy for lung metastasis	neck tumor and lymph nodes at 5 months, lung metastasis	DNA
Rossi et al	68/M	Smoking 15 pack yrs	Multiple	Wide field laryngectomy with thyroid lobectomy +RT	pleural effusion, pulmonary metastasis,	Death at 3 months
Myssiorek et al	47/M	-	Multiple	TL+RT+ Chemotherapy	Bone and lung metastasis	Death at 1 year
Van Laer CG et al	75/M	Osteosarcoma arose by dedifferentiation of chondrosarcoma of cricoid cartilage	1	TL+chemotherapy, RT for soft tissue recurrence in neck	recurrence in soft tissues of neck 13 months later	DNA
Pinsolle et al	65/M	-	1	Thyrotomy with tumor resection + tracheostomy +RT, skin nodule resection for recurrence	recurrence 1 month,	free of disease 60 months
Remagen et al	65/M	-	1	RT 4500 gy, 4000gy after 1 year for recurrence	recurrence after 1 year	dna
Suchatlampong	67/M	-	1	RT 6700 gy to neck	-	death after 6

et al						months
Haar et al	66/M	-	1	TL with thyroidectomy	Lung metastasis	death 20 months
Sprinkle et al	71/M	-	1	TL		alive free of disease at 24 months
Jackson et al	51/M	-	-	TL	recurrence 3 months,	death 6 months with mediatinal metastasis
Clerf et al	51/M	-		TL, external RT for local recurrence	local recurrence, neck, lung metastasis	, death 14 months
Laskin et al	56/M	RT 3 years prior for SCCa larnx	-	DNA	DNA	DNA

The review of literature reveals it to have a male preponderance with 22 patients being male and only 2 being female. Patients usually present in 6th and 7th decade with average age being 65 years. Youngest age at presentation was 47 years and oldest was 80years (Rossi *et al.,* 1998).

Patients usually present with symptoms of upper airway obstruction. The etiology of osteosarcoma of larynx is unknown. Only 6(25%) of the reported cases mentioned a positive history of smoking. Four (16%) of the cases had a past history of radiotherapy to neck, 3 of which were for squamous cell carcinoma of larynx and 1 was for carcinoma of nasopharynx. Latent period of developing osteosarcoma larynx following radiotherapy varied from 3 years to 32 years (Topaloglu *et al.,* 2004). On physical examination osteosarcoma is reported as a laryngeal submucosal mass at glottic level filling the endolarynx. This submucosal mass has subglottic and or supraglottic extension and compromises the airway.

Cervical lymphadenopathy has not been reported in any of the cases. Expansion of laryngeal framework has been reported in some cases (Athré *et al.,* 2005).

Seven (29%) of the reported cases needed multiple biopsies of the laryngeal mass to characterise it as a sarcoma. The initial biopsies have been reported as pyogenic granuloma, mesenchymal neoplasia, chondroradionecrosis, chondroma, atypical chondroblastoma and angioleiomyoma exulcerans in some of these case reports requiring repeat biopsies and IHC to finally characterise it as osteosarcoma of larynx. Thus the diagnosis is usually delayed due to multiple biopsies required and rarity of this neoplasm in larynx.

Histopathologic features which suggested the diagnosis of osteosarcoma of larynx consisted of spindle and stellate cells in loose whorled reticular matrix, eosinophillic hyaline material (osteoid), large sinusoidal spaces, giant cells and osteoclasts. IHC was positive for vimentin and alpha 1 antitrypsin, and negative for desmin, S100

protein and cytokeratin (Esraa Mosalleum *et al.,* 2015).

Various radiologic features in these cases included soft tissue mass obliterating the laryngeal airway, calcification in laryngeal soft tissue and cartilage, expansile lesion of laryngeal cartilages.

Treatment of osteosarcoma is surgery, radiation therapy and chemotherapy. The regimen recommended by COSS group includes methotrexate, doxorubicin and cisplatin. 21 patients underwent surgery for osteosarcoma of larynx which included either total laryngectomy, extended laryngectomy, wide field laryngectomy with or without thyroidectomy or neck dissection. 2 of these patients received postoperative chemotherapy, 2 postoperative chemoradiotherapy and 2 postoperative radiotherapy. 2 of these laryngectomy patients received radiotherapy for local recurrence later. 2 of the 24 patients were treated only with external radiotherapy. There was no data available on mode of treatment of 1 case report (Arslan *et al.,* 2008; Topaloglu *et al.,* 2004).

18 (75%) of the patients developed recurrence which was either local recurrence, bony metastasis, pulmonary metastasis or mediastinal metastasis at an average of 7.8 months following initial treatment. Earliest recurrence was noted at 2 weeks duration. 13 patients who developed recurrence (54.1% of total patients) were reported to be dead at an average of 10.7 months after initial treatment due to extensive distant metastasis. There was no follow up data available on 5 patients who developed recurrence. Only 6 (25%) patients were reported to be alive and free of disease at a mean follow up time of 41 months. The longest follow up was for 8 years (Madrigal *et al.,* 2002; Giampiero Mottola, 2008).

Figure.1 CT Scan with contrast. Tumour mass affecting glottic and supraglottic larynx, which involved the thyroid cartilage and the paralaryngeal space with presence of some calcifications

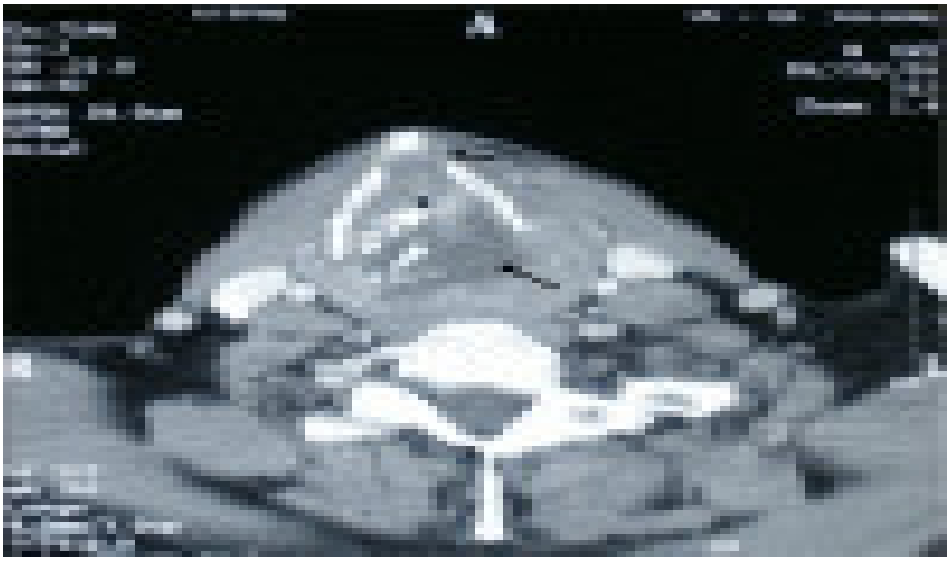


Figure.2 Histopathology showing large spindle cells in eosinophyllic myxoid matrix with

intensely staining large nuclei with abundant chromatin and prominent nucleoli (Hematoxilin-Eosin 10x)

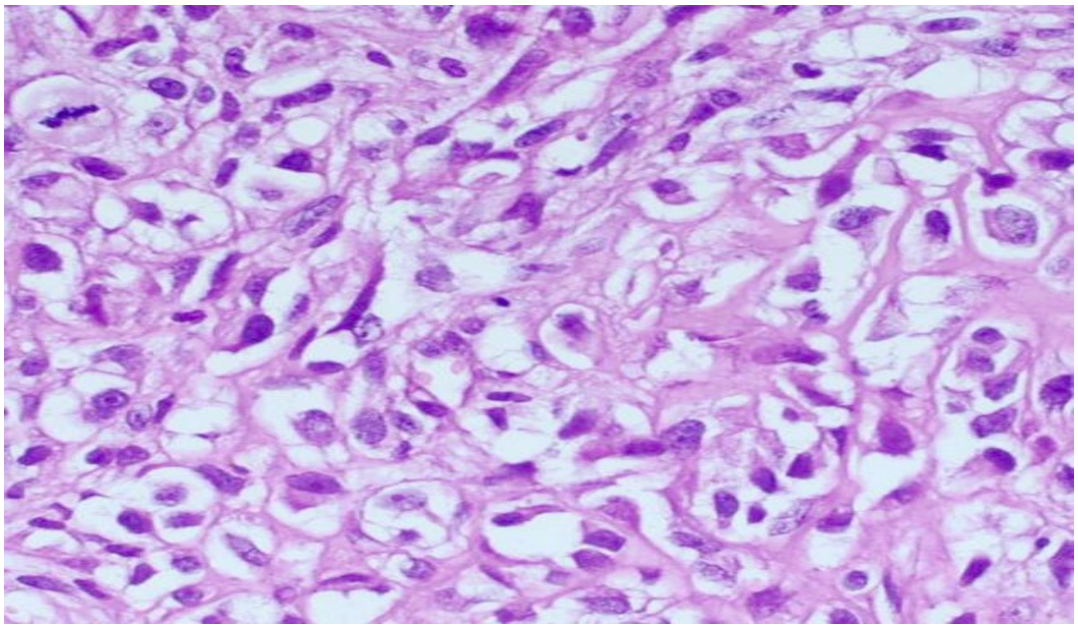
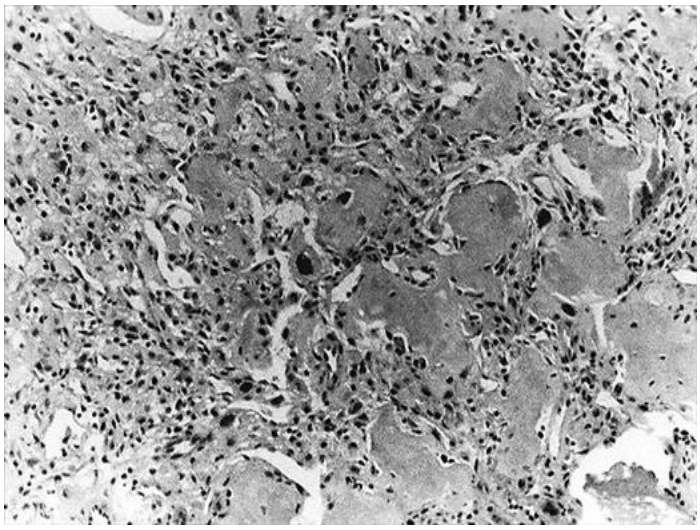


Figure.3 Photomicrograph of laryngeal osteosarcoma shows a high-grade lesion composed of pleomorphic malignant cells forming osteoid. The tumor cells have large, hyperchromatic, irregular nuclei with a high nucleus-to-cytoplasm ratio and eosinophilic cytoplasm (hematoxylin-eosin, original magnification ×400)



Conclusion

The present study has presented the 24th case of osteosarcoma of larynx in literature. It is a rare and aggressive malignancy of larynx usually seen in males in 6th to 7th decade. It presents with symptoms of upper airway obstruction and has a submucosal mass which may require repeated biopsies and IHC for it to be characterised as osteosarcoma. A high degree of suspicion is required for its early diagnosis. Treatment

primarily consists of surgical excision followed by chemo- radiotherapy. Despite all efforts the patient usually develops recurrence and distant metastasis and this malignancy of larynx has a poor prognosis.

Reference

Arslan, M., Orhan-Kizilkaya, H., Yalcin, B., Aksakal, O., Uyanoglu, A., Ozturk, S., Erkal, H., Kabukcuoglu, F. 2008. Larynx osteosarcoma: case report. *J. BUON.*, 13(3): 437–9.

Athré, R.S., Vories, A., Mudrovich, S., Ducic, Y. 2005. Osteosarcomas of the larynx. *Laryngoscope*, 115(1): 74–7.

Berge, J.K., Kapadia, S.B., Myers, E.N. 1998. Osteosarcoma of the larynx. *Arch. Otolaryngol. Head Neck Surg.*, 124(2): 207–10.

Dahm, L.J., Schaefer, S.D., Carder, H.M., Vellios, F. 1978. Osteosarcoma of the soft tissue of the larynx: Report of a case with light and electron microscopic studies. *Cancer*, 42: 2343–2351.

Esraa Mosalleum, Amir Afrogheh, Sacha Stofberg, Abraham Fourie Bezuidenhout, Johann Schneider, Jos Hille. 2015. A review of primary osteosarcoma of the larynx and case report. *Head Neck Pathol.*, 9(1): 158–164.

Giampiero Mottola, Anna Maria Cascone, Matteo Cavaliere, Basilio Angrisani, Gabriella Fiorillo, Giuseppe Parente, Fabrizio Volino, Maurizio Iemma, 2008. Osteosarcoma of the larynx: a case report. *Cases J.*, 1: 365.

Kassir, R.R., Rassekh, C.H., Kinsella, J.B., Segas, J., Carrau, R.L., Hokanson, J.A. 1997. Osteosarcoma of the Head and neck: Meta-analysis of nonrandomized studies. *Laryngoscope*, 107: 56–61.

Madrigal, F.M., Godoy, L.M., Daboin, K.P., Casiraghi, O., Garcia, A.M., Luna, M.A. 2002. Laryngeal osteosarcoma: a clinicopathologic analysis of four cases and comparison with a carcinosarcoma. *Ann. Diagn. Pathol.*, 6(1): 1–9.

Madrigal, F.M., Godoy, L.M., Daboin, K.P., Casiraghi, O., Garcia, A.M., Luna, M.A. 2002. Laryngeal osteosarcoma: a clinicopathologic analysis of four cases and comparison with a carcinosarcoma. *Ann. Diagn. Pathol.*, 6(1): 1–9.

Rossi, R.M., Landas, S.K., Kelly, D.R., Marsh, W.L. 1998. Osteosarcoma of the larynx. *Otolaryngol. Head Neck Surg.*, 118: 385–388.

Topaloglu, I., Isiksacan, V., Ulusoy, S., Sisman, S. 2004. Osteosarcoma of the larynx. *Otolaryngol Head Neck Surg.*, 131: 789–790.

Topaloglu, I., Isiksacan, V., Ulusoy, S., Sisman, S. 2004. Osteosarcoma of the larynx. *Otolaryngol. Head Neck Surg.*, 131: 789–790.