Annals of Diagnostic Pathology 37 (2018) 35–41

Contents lists available at ScienceDirect

Annals of Diagnostic Pathology

journal homepage: www.elsevier.com/locate/anndiagpath

Original Contribution

Laryngeal sarcomas: A case series of 5 cases

Badr AbdullGaffar*, Tasnim Keloth

Pathology Section, Rashid Hospital, Dubai, United Arab Emirates

ARTICLE INFO

Keywords:
Larynx
Sarcoma
Mesenchymal
Malignancy

ABSTRACT

Primary sarcomas of the larynx are rare and miscellaneous. The most common is chondrosarcoma. Other sarcomas are very rare. Sarcomas can have heterogeneous morphologic features of spindle, small round, epithelioid, pleomorphic and giant cells. Laryngeal sarcomas may mimic carcinomas, lymphomas, small cell carcinoma, mesothelioma and melanoma. This imposes diagnostic challenges for unfamiliar pathologists particularly in small laryngeal biopsies. Our aim was to study the different types of sarcomas that can involve the larynx in our institution, to investigate their diagnostic challenges and potential pitfalls and to find helpful histologic clues to avoid misinterpretation and missed diagnosis. We performed a retrospective review study over 13 years. We retrieved 5 cases of laryngeal sarcomas. They included Kaposi sarcoma, low-grade chondrosarcoma, epithelioid angiosarcoma, polypoid leiomyosarcoma and small cell osteosarcoma. The age range was between 32 and 74 years with an average age of 52 years. The male to female ratio was 3:2. The Kaposi sarcoma and chondrosarcoma were correctly diagnosed. The angiosarcoma was initially missed as recurrent carcinoma. The leiomyosarcoma was initially inferred as polypoid sarcomatoid squamous cell carcinoma. The small cell osteosarcoma initiated the differential diagnosis of high-grade lymphoma, small cell carcinoma, undifferentiated carcinoma, Ewing sarcoma and rhabdomyosarcoma. An implementation of a panel of immunohistochemical markers guided by certain histomorphologic clues was helpful to make the correct diagnosis. Pathologists should be aware of the morphologic spectrum and different growth patterns of laryngeal sarcomas. Immunohistochemistry studies are essential. Correct diagnosis, classification and grading of laryngeal sarcomas are clinically important for the prognosis and appropriate management of patients.

1. Introduction

Primary sarcomas of the larynx are rare, the most common of which is chondrosarcoma [1-3]. Other sarcomas are very rare. Different types of sarcomas have been described in the larynx [1-5]. Sarcomas can have various morphologic features demonstrating spindle, pleomorphic anaplastic, small round, epithelioid and giant cells. They can be confused with carcinomas, lymphomas, small cell carcinoma, mesothelioma and melanoma. This imposes diagnostic challenges for unwary pathologists particularly in small laryngeal biopsies [6]. Some low-grade sarcomas can be confused with benign stromal neoplasms and tumor-like nodules. An awareness of the different types of sarcomas that can involve the larynx, an attention to certain histomorphologic features and application of ancillary immunohistochemical studies assist pathologists to avoid potential pitfalls and reach the correct diagnosis. We performed a retrospective review study to investigate the different types of laryngeal sarcomas in our institution, to study their potential diagnostic challenges and to find helpful histologic clues to avoid potential pitfalls.

2. Materials and methods

We searched for laryngeal malignancies, mesenchymal neoplasms, stromal nodules and polyps using a computer-based search to retrieve all of the cases of primary sarcomas of the larynx in our institution over the past 13 years from 2018 to 2005. We reviewed the microscopic descriptions, final diagnoses and diagnosis comments from all the pathology reports. We selected cases with an established diagnosis of sarcoma. We also searched for reports describing undifferentiated carcinoma, spindle cell carcinoma, sarcomatoid carcinoma, anaplastic lymphoma and melanoma. We retrieved the archived hematoxylin and eosin (H&E) stained slides and the available previously performed immunohistochemical slides of these cases. We reviewed the slides to confirm the diagnosis of sarcoma. An extended immunohistochemistry (IHC) study for additional markers was performed as per the microscopic appearance and differential diagnosis of certain reviewed cases that were initially described as undifferentiated carcinoma and spindle cell sarcomatoid carcinoma. Cases with a confirmed immunohistochemical diagnosis of sarcomatoid carcinoma or cases of

* Corresponding author at: Pathology Section, Rashid Hospital, Oud Metha Road, 4545, Dubai, United Arab Emirates.
E-mail address: badraah009@yahoo.com (B. AbdullGaffar).

https://doi.org/10.1016/j.anndiagpath.2018.09.007

Table 1
Clinical features of the patients with laryngeal sarcomas.

SN	Age	Sex	Clinical presentation	Clinical findings/initial impression
1	42	M	Cough, painful swallowing and change in voice ×2 months Heavy smoker, alcoholic, HIV-positive	Indurated ulcerated nonhealing brown lesions on larynx (supraglottic) and palate/Kaposi sarcoma
2	41	F	Change in voice ×3 months An incidental finding of a laryngeal nodule by an anesthetist during endotracheal intubation for septorhinoplasty Non-smoker, no alcohol intake	Right subglottic mass (2 cm) narrowing the lumen and eroding the cricoid cartilage/neoplastic lesion
3	70	M	Stridor and dysphagia ×3 months Smoker, no alcohol intake	Left supraglottic mass (2 cm) extending into left vocal cord + left neck lymphadenopathy, known case of tongue squamous cell carcinoma operated 8 years ago with radiotherapy/ recurrent carcinoma
4	74	M	Change of voice ×2 months Non-smoker, no alcohol intake	Right vocal cord polyp (2 cm) extending into subglottis/vocal cord polyp
5	32	F	Hoarseness of voice ×1.5 month Non-smoker, no alcohol intake	Right subglottic nodule (1.5 cm)/chondroma or chondrosarcoma

SN: serial number, F: female, M: male, +: with.

benign stromal neoplasms and tumor-like lesions were excluded. Cases with a secondary extension from adjacent organs and tissues or metastatic to the larynx were also excluded. We have collected the relevant clinical features for each patient with a primary laryngeal sarcoma. The data included age, gender, initial clinical presentation, site, size, and available information regarding provided treatment, follow up and history of recurrence and survival data.

3. Results

We found five cases of primary sarcomas of the larynx. The age range was between 32 and 74 years with an average age of 52 years. The male to female ratio was 3:2 (Table 1). The cases of primary laryngeal sarcomas included Kaposi sarcoma, chondrosarcoma, angiosarcoma, leiomyosarcoma and osteosarcoma (Table 2). Kaposi sarcoma (Fig. 1A, B) and chondrosarcoma (Fig. 1C, D) were histologically spotted and correctly diagnosed. The angiosarcoma was initially diagnosed as recurrent undifferentiated carcinoma. It showed solid sheets of epithelial-like cells (Fig. 1E). We performed epithelial markers (CK (AE1/AE3), BerEP4 and EMA. However, the cells were negative. This sheds some doubt on the initial histologic diagnosis. Our differential diagnosis included anaplastic lymphomas, melanoma and epithelioid sarcomas. We have extended the IHC markers to include LCA, CD20, CD3, ALK, S-100, Melan-A, SMA, desmin, vimentin, CD34 and CD31. The tumor cells were positive for vimentin, CD31 and CD34 (Fig. 1F). The final diagnosis was epithelioid angiosarcoma. The leiomyosarcoma was initially interpreted as polypoid sarcomatoid spindle cell carcinoma because it was a polyp with a spindle cell and epithelioid appearance (Fig. 2A, B). The tumor cells were negative for CK (AE1/AE3), CK5/6, P63, BerEP4 and EMA. An extended IHC study for vimentin, SMA, h-caldesmon, desmin, myogenin, calponin, S-100 protein, Melan-A, CD34, CD31, DOG1 and CD117 was performed to cover the differential diagnosis of stromal neoplasms and melanoma. The neoplastic cells were positive for vimentin, SMA, calponin and h-caldesmon (Fig. 2C). Our final conclusion was leiomyosarcoma. The case of osteosarcoma showed solid sheets of small round undifferentiated cells (Fig. 2D, E). The presence of foci of osteoid material and new bone formation (Fig. 2F) raised the possibility of osteosarcoma. Given the rarity of osteosarcoma in the larynx, our differential diagnosis included lymphoma, Ewing sarcoma, small cell carcinoma, undifferentiated carcinoma and rhabdomyosarcoma. An IHC study for LCA, CD20, CD3, CK (AE1/AE3), CD99, CD56, synaptophysin, chromogranin and desmin was performed. The neoplastic cells were positive for vimentin (Fig. 2F). The tumor cells did not stain for the other markers. Our final diagnosis was osteosarcoma. The patient with Kaposi sarcoma had received antiretroviral therapy and systemic chemotherapy. He had a recurrent Kaposi sarcoma skin nodule on the left leg after 6 months. Two years later, the patient died of AIDS-related complications. Unfortunately, we have lost follow up of the remaining four patients. We have no records of initial treatment in our institution and we have no survival data of these patients. The patients preferred to travel abroad to seek a specialist referral center for a second opinion and treatment.

4. Discussion

Albeit the larynx is a small tubular organ that connects the pharynx to the trachea, it is complex and divided into various compartments with different epithelial and stromal tissues. Different types of sarcomas that primarily involved the larynx have been reported in the literature [1-5]. The most common is chondrosarcoma [1-3]. Other reported sarcomas included leiomyosarcoma, osteosarcoma, angiosarcoma, Kaposi sarcoma, rhabdomyosarcoma, fibrosarcoma, synovial sarcoma, pleomorphic sarcoma (so-called malignant fibrous histiocytoma (MFH) and liposarcoma (Table 3). Other types of sarcomas of the larynx are extremely rare with only few single case reports. With the advent of IHC many of the previously reported cases of fibrosarcoma and to a certain extent MFH might had proven to be sarcomatoid carcinomas since there is a decreasing trend in reporting of these cases in recent years compared to old case series reports (Table 3). The wide range of different types of sarcomas that can involve the larynx with variable histomorphologic features imposes diagnostic challenges and potential pitfalls. An attention to certain important diagnostic histomorphologic features and the application of appropriate IHC and cytogenetics studies are essential diagnostic tools (Table 4). Given the rarity, diversity and nonspecific initial histopathologic appearances of laryngeal sarcomas, we reviewed the histologic findings and IHC profiles of our cases and their differential diagnosis to highlight these diagnostic challenges and potential pitfalls.

Our study showed two cases that were histologically diagnosed without difficulties, two cases that imposed diagnostic challenges and a case that was initially misinterpreted (Table 2). Kaposi sarcoma of the upper aerodigestive tract is commonly associated with HIV-infected patients, but can occur in immunocompetent patients [7]. Well-established lesions have characteristic features of fascicles of spindle cells with red blood cell-filled slits, PAS-positive hyaline globules and hemosiderin pigment. The spindle cells are positive for CD31 and CD34 and show a nuclear staining for HHV8. Chondrosarcoma of the larynx is a relatively easy histologic diagnosis. The main task of pathologists is to rule out the presence of high-grade foci, myxoid-type chondrosarcoma or dedifferentiation by looking for tumor necrosis, marked anaplasia, mitosis and presence of high-grade spindle cell sarcoma juxtaposed to a low-grade chondrosarcoma component [1]. This is important for the prognosis of the patients. Chondrosarcoma has to be discriminated from chondroblastic osteosarcoma. The presence of cellular chondroid lobules of high-grade malignancy surrounded by hypercellular spindle