Thyroid Angiosarcoma : An unusual and challenging case report at B.P. Koirala Institute of Health Sciences

Lamichhane U,[1] Paudyal P,[1] Karki S,[1] Pradhan A,[1] Dahal M,[1] Shah SP[2]

[1]Department of Pathology,

[2]Department of ENT,

B. P. Koirala Institute of Health Sciences,

Dharan, Nepal.

Corresponding Author

Upasana Lamichhane

Department of Pathology

Rapti Provincial Hospital, Tulsipur, Dang.

E-mail: meupasanalc@gmail.com

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ABSTRACT

Angiosarcoma is an uncommon malignant vascular tumor of endothelial origin and commonly described in soft tissue. Thyroid is an uncommon site for angiosarcoma and is a very aggressive tumor commonly occurring in elderly female, characterized by its prevalence in Alpine regions of central Europe. The main aim of this case report is to provide an insight on thyroid angiosarcoma (TAS) occurring in non-Alpine region, to know the major diagnostic features of thyroid angiosarcoma and distinguish it from anaplastic thyroid carcinoma with angiomatoid features. Due to its overlapping microscopic features diagnosis of primary thyroid angiosarcoma (TAS) was challenging. However, the combination of thorough microscopic findings and immunohistochemical studies (CD 31, Vimentin, Thyroglobulin and Thyroid Transcription Factor-1) are vitally important in differentiating these two tumors to achieve at a final diagnosis. This significantly helps to decide the best treatment option and predict the behaviour.

KEY WORDS

Anaplastic carcinoma, Angiosarcoma, Thyroid gland

INTRODUCTION

Angiosarcoma is a rare type of soft tissue sarcoma with the morphological and immunohistochemical features of endothelial cells. It accounts for 1-4% of all soft tissue sarcoma cases.[1,2] The majority of clinically apparent thyroid neoplasms are primary and epithelial, while mesenchymal tumors, which are commonly seen in other parts of the body, are rare in the thyroid.[3,4] Thyroid angiosarcoma (TAS) is a very rare and highly aggressive malignancy that is mostly seen in elderly of Alpine regions, related to high prevalence of iodine deficient goiter. It is a very aggressive tumor due to persistent local disease and distant metastases.[3,5] The major diagnostic challenge of TAS is to distinguish this entity from anaplastic carcinoma with angiomatoid features and to specify whether it is a primary or metastatic angiosarcoma.[6] Therefore we aim to report the rare case of TAS here.

CASE REPORT

A 68 years old female presented to the outpatient department of otorhinolaryngology and maxillofacial surgery with swelling in the right anterior neck region for one year. Physical examination showed a globular mass of size 6x5 cm^2 located on the right lower anterior aspect of neck, extending from level of thyroid notch above, upto the clavicle below. It was non-tender, moved on swallowing but didn't move on protrusion of tongue. Clinical diagnosis of solitary thyroid nodule was made.

Ultrasonography neck

The sonography of neck revealed a well-defined heterogeneous hypoechoic lesion with peripheral halo and multiple coarse foci of calcifications within with no internal vascularity in right lobe of thyroid. Few bilateral sub mandibular, upper, middle and lower cervical lymph nodes with intact fatty hilum were noted.

Then patient underwent FNAC and the diagnosis of suspicious for malignancy, not otherwise specified was given with the advice of clinical and radiological correlation. Patient underwent right hemithyroidectomy.

Gross appearance

On gross examination, right thyroid lobe and isthmus measured 5.5 X 3 X 3.5 cm and 1.5 X 0.5 X 0.3 cm

respectively. On serial sectioning, a solid-cystic grey white to grey brown lesion was identified of size measuring 2.5 X 2 X 2 cm in superior pole. Hence, extensive grossing was performed.

Microscopy and Immunohistochemistry (IHC)

Multiple representative sections examined reveal proliferation of variable sized capillaries, staghorn like vascular channels lined by swollen and atypical endothelial cells even invaginating into the irregularly dilated vascular spaces (Fig. 1) along with areas of calcification, hyalinizatiaon and fibrosis. Atypical endothelial cells were arranged in solid sheets and forming glomeruloid structures as well. Individual cells have oval to spindle nuclei, vesicular chromatin, visible to prominent eosinophilic nucleoli and eosinophilic to vacuolated cytoplasm (Fig. 2). Frequent atypical mitotic figures, apoptotic cells, cells having multilobed nucleus, bizzare forms, neutrophils causing destruction and fibrinoid necrosis of vessel wall (vasculitis) with large areas of hemorrhage and necrosis were observed in between the proliferating atypical endothelial cells. Occasional cell exhibit RBCs filled intracytoplasmic lumina as well. Total three lymph nodes dissected out showed features of reactive lymphadenitis. Considering the histomorphological findings possibilities of malignant vascular tumor with closest morphological resemblance to Angiosarcoma and Anaplastic carcinoma with angiomatoid features was considered with the advice of immunohistochemistry (IHC) for confirmation. IHC test performed outside showed tumor cells positive for Vimentin, CD31 (Fig. 3) and negative for Thyroglobulin and Thyroid Transcription Factor-1 confirming the diagnosis of high grade vascular tumor possibly angiosarcoma. After the diagnosis patient underwent completion thyroidectomy with central neck clearance and tracheostomy. A cystic mass of size 4 X 3 cm of left lobe is identified. Left external branch of superior laryngeal nerve and parathyroid gland were identified and preserved.

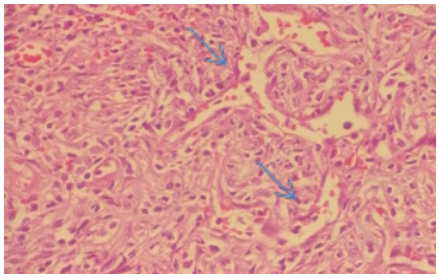

Figure 1. Photomicrograph revealing proliferation of variable sized capillaries, staghorn like vascular channels lined by swollen and atypical endothelial cells even invaginating into the irregularly dilated vascular spaces (arrow) (100X; HE)

Histopathology from left lobe was suggestive of lymphocytic thyroiditis and level VI lymph node was suggestive of reactive follicular hyperplasia. Disease condition and prognosis has been explained to the patient and was advised for regular follow up. Patient is doing fine and is following up regularly in outpatient department.

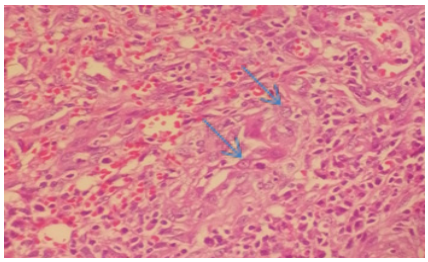

Figure 2. Photomicrograph revealing atypical endothelial cells arranged in solid sheets and individual cells have oval to spindle nuclei, vesicular chromatin, visible to prominent eosinophilic nucleoli and eosinophilic to vacuolated cytoplasm (arrow) (400X; HE)

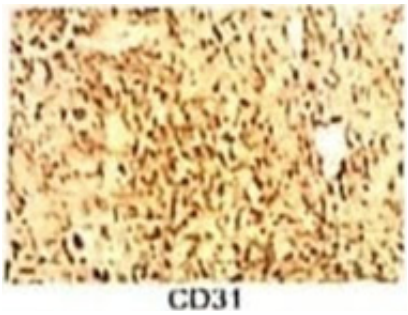

Figure 3. Photomicrograph shows tumor cells positive for CD31 (400X; IHC)

DISCUSSION

Primary thyroid sarcomas (PTS) are rare sarcomas and represent less than 1% of all sarcoma diagnoses.[7] PTS consist of angiosarcomas, malignant haemangioendotheliomas, fibrous histiocytomas, leiomyosarcomas, fibrosarcomas, osteosarcomas and liposarcomas.[8] Thyroid angiosarcoma is a rare and aggressive mesenchymal tumor, which has been the subject of controversy, especially when it comes to it being differentiated from anaplastic thyroid carcinoma. For years, it was considered a vascular mutation of anaplastic carcinoma and not a true sarcoma. The first recorded case of angiosarcoma was in 1986, when immunohistological techniques confirmed the endothelial origin of the tumor.[9] Primary angiosarcoma of thyroid was only recognized as a distinct entity in the WHO classification in 2013.[10]

Typically, TAS incidence increases with age older than 60 years and affects women more than men. In the case reported here also an elderly female presented with anterior neck mass. TAS firstly described in the English-literature in 1953, its etiopathogenesis is still not determined.[11] Several predisposing conditions has been described. The main association is the iodine deficiency and consequent endemic nodular goiter. Although TAS is almost unknown in many countries worldwide, it typically accounts for 15-20% of all thyroid malignancies in people living in mountainous alpine regions of Europe, including Switzerland, North Italy and Austria.[12]

Previous ionizing radiation exposure, as well as polyvinyl chloride and thorium dioxide (Thorotrast) exposure seems to be an environmental cause of TAS.[13]

Histological examination often reveals degenerative changes, fresh and old stromal haemorrhage. In classic cases a freely anastomosing architecture may be noted featuring channels lined by atypical endothelial cells, focal tumor necrosis and spotty calcifications. The epithelioid variant is characterized by solid sheets of poorly differentiated polygonal cells with abundant, stainable cytoplasm. Rudimentary or abortive vascular differentiation featuring intra cytoplasmic vacuolations, either empty or containing red blood cells may be recognized. Tumor cells have large vesicular nuclei with prominent nucleoli, and brisk mitotic activity is common.[14] Similar morphologic features has been noted in the current case as well. Immunohistochemistry (IHC) is a valuable tool in the evaluation of thyroid angiosarcoma and the tumor cells are positive for ERG, CD 31, CD 34, and the "time honoured" Factor VIII related antigen.[15]

For this case panels of IHC has been performed and the report confirmed it to be a case of malignant tumor of vascular origin by revealing tumor cells positivity for CD 31 (Fig. 3), Vimentin and negative for Thyroglobulin and Thyroid Transcription Factor - 1. With this, the diagnosis of high grade vascular tumor possibly angiosarcoma was confirmed.

Due to unusual localization of this tumor, reaching to a definite diagnosis for this rare histological type of primary thyroid tumor was challenging. A comprehensive panel of immunohistochemical markers may assist in the discrimination between TAS and anaplastic thyroid carcinoma with angiomatoid features which aid to achieve the final diagnosis. Definite diagnosis with the tumor free surrounding structures ultimately plays an important role in patient timely management and in predicting the survival.

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