Human Pathology: Case Reports (2016) 4, 38–41

ELSEVIER

Human PATHOLOGY Case Reports

http://www.humanpathologycasereports.com

Extraskeletal Ewing sarcoma of the parapharyngeal space with a unique translocation, t(19;22) (q13.4;q12.2)

Gloria Ramos-Rivera[a,*], Esther Adler[b], K.H. Ramesh[a], Bradley Schiff[c], Mark Suhrland[a], Samer Khader[a]

[a]*Montefiore Medical Center/Department of Pathology, The University Hospital for Albert Einstein College of Medicine, 111 E. 210th Street, Central 410, Bronx, NY 10467, United States*
[b]*Kings County Hospital Center, P-Building, 451 Clarkson Avenue, Brooklyn, NY 11203, United States*
[c]*Montefiore Medical Center/Department of Otolaryngology, Head & Neck Surgery, The University Hospital for Albert Einstein College of Medicine, Montefiore Greene Medical Arts Pavilion, 3400 Bainbridge Avenue, Bronx, NY 10467-2404, United States*

Received 4 May 2015; revised 13 July 2015; accepted 24 July 2015

Keywords:
Extraskeletal Ewing sarcoma;
Ewing sarcoma family of tumors;
Parapharyngeal space;
t(19;22)(q13.4;q12.2)

Abstract Extraskeletal Ewing sarcomas of the parapharyngeal space are extremely rare. It has been documented that Ewing sarcomas are morphologically and molecularly indistinguishable regardless of the tissue of origin. Around 85% of Ewing sarcomas are associated with translocation t(11;22)(q24.1;12.2) generating the EWSR1–FLI1 fusion oncoprotein. We report a case of an extraskeletal Ewing sarcoma arising in the parapharyngeal space with a unique translocation: t(19; 22) (q13.4;q12.2). To our knowledge this is the first case of an extraskeletal Ewing sarcoma exhibiting this translocation.

1. Introduction

Ewing sarcoma (ES) is a member of the Ewing sarcoma family of tumors (ESFT), which is a group of small round blue cell neoplasms comprising the second most frequent primary bone malignancy in children and young adults [1]. ESFT include ES, primitive neuroectodermal tumor (PNET), and Askin's tumor [2]. Approximately 15% of ES may arise in extra osseous sites [3,4] which rarely include the head and neck region [4]. Extraskeletal Ewing sarcoma (EES) most commonly occurs in the trunk or extremities and has no sex predilection [1]. Regardless the tissue of origin, ES is morphologically and molecularly indistinguishable [5].

Approximately 90% of ES cases demonstrate the translocation t(11;22)(q24.1;q12.2) creating a fusion gene between EWSR1 and FLI1, a member of the ETS family of transcription factors [6]. Most of the remaining 5%–10% of cases demonstrate a fusion between EWSR1 and ERG, which is another ETS family transcription factor located on chromosome 21q22.3 [6]. Other translocations are rare and are mainly described as fusions between EWSR1 or EWSR1-related genes and other ETS family transcription factors, such as ETV1, EIAF

* Corresponding author at: Montefiore Medical Center/Department of Pathology, Albert Einstein College of Medicine, 111 E. 210th Street, Central 410, Bronx, NY 10467, United States. Tel.: +1 718 920 6573; fax: +1 718 547 8349.
E-mail address: gramosr@montefiore.org (G. Ramos-Rivera).

http://dx.doi.org/10.1016/j.ehpc.2015.07.003

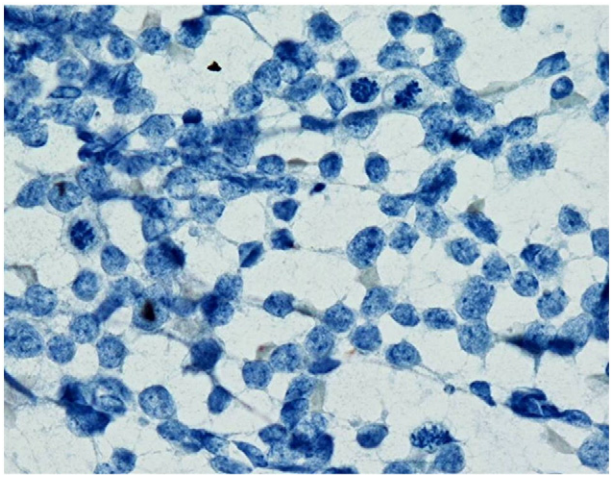

Fig. 1 Fine needle aspiration specimen showing clustered and single cells with round to oval nuclei, granular chromatin and mitotic figures.

(ETV4) and FEV [3,6]. The most frequently reported alternate translocations are t(7;22)(p22;q12.2) (EWSR1/ETV1), t(2;21;22)(q33;q22;q12.2) (EWSR1/FEV) and t(17;22)(q12;q12.2) (EWSR1/E1AF) [3].

2. Case report

A 23 year old female presented with a rapidly enlarging mass of the left parapharyngeal space. MRI of the orbits, face and neck revealed a 4.0 cm heterogeneously enhancing mass in the left carotid space, displacing the carotid bifurcation anteriorly. Fine needle aspiration (FNA) biopsy demonstrated evidence of a neoplasm showing clustered and single cells with round to oval nuclei, granular chromatin, few nucleoli, scanty cytoplasm, abundant mitotic figures and degenerated nuclei suggestive of a high-grade neoplasm (Fig. 1). The differential diagnosis included a poorly differentiated carcinoma, undifferentiated carcinoma, and poorly differentiated acinic cell carcinoma. Immunostains for chromogranin, synaptophysin, AE1/AE3, CD34, leukocyte common antigen, HMB-45, and smooth muscle actin were negative. S100 showed focal staining but this did not assist in further classification of this lesion. The needle rinse material from the FNA specimen was evaluated with flow cytometry and a lymphoma diagnosis was ruled out.

An incisional biopsy of the mass was diagnosed as small round blue cell malignant neoplasm. Immunohistochemical staining demonstrated strong positivity for S100, CD56 and vimentin and weak membranous staining of O13 (CD99) which was initially interpreted as negative. The tumor cells were negative for multiple cytokeratins (CAM5.2, AE1:AE3 and CK903), muscle markers (myoD1 and myogenin), neuroendocrine markers (neuron specific enolase, chromogranin and synaptophysin), vascular markers (CD31 and CD34) as well as leukocyte common antigen (CD45) and the melanoma marker Melan A. While the tumor had a neuroectodermal-type appearance, the weak O13 immunostain did not support the classification as PNET/Ewing sarcoma.

The patient was taken to the operating room for excision of the mass and a level I–IV left neck dissection. The mass involved the left vagus nerve, jugular vein, and the muscles of the floor of the neck but was completely excised without complications (Fig. 2). Histopathological examination revealed a small round blue cell neoplasm with multiple foci of perineural invasion involving the sympathetic chain, and metastasis to two cervical lymph nodes at levels 2 and 3. The tumor was strongly positive for S100 and focally positive for synaptophysin and O13 (CD99), while the following stains were negative: cytokeratins (CAM5.2 and AE1:AE3), muscle markers (muscle specific actin, myoD1, myogenin, calponin and caldesmon), neuroendocrine markers (neuron specific enolase, neurophilament, chromogranin and synaptophysin), as well as Leu-7 (CD57), CK20 and the melanoma markers (Melan A and human melanoma black), supporting the diagnosis of PNET/ES. The chromosome analysis of the resected tumor showed a t(19; 22)(q13.4;q12.2) confirmed by fluorescence in situ hybridization (FISH) analysis using ZNF443 (19p13.13), CRX (19q13.3) and

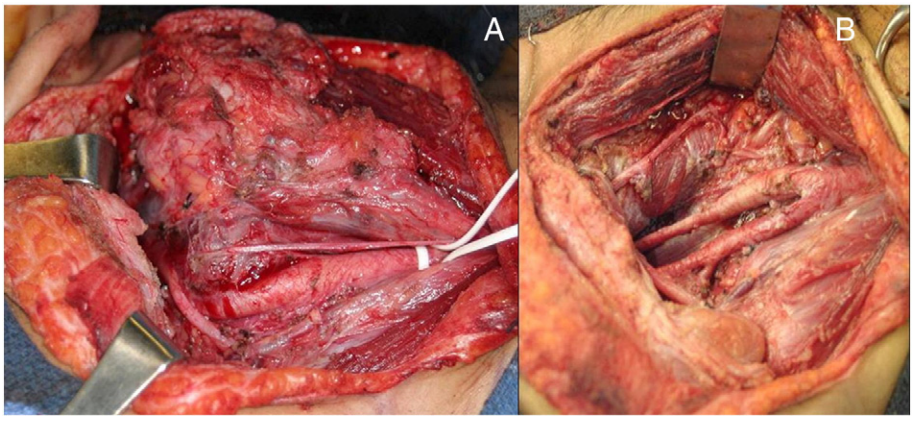

Fig. 2 Resection of parapharyngeal mass. Pre-operative picture showing the tumor between the carotid artery and the jugular vein with the vagus nerve entering the mass (A). Post-operative picture after resection of the mass, vagus nerve and jugular vein showing the preserved carotid artery (B).