Case Report

rare tumors

Rare Tumors
Volume 16: 1–5

DOI: 10.1177/20363613241242570
journals.sagepub.com/home/rtu
Sage

Ewing's sarcoma of the parotid gland: A rare entity with review of the literature

Hayfa Chahdoura[1], Alia Mousli[1,2], Ghaiet el Fidaa Noubigh[1,2], Safia Yahyaoui[1,2], Rim Abidi[1,2] and Nasr Chiraz[1,2]

Abstract

Background: Ewing's sarcoma is a rare malignant entity. Extraosseous Ewing's sarcoma (EES) of the head and neck region is a rare occurrence, and Ewing's sarcoma of the parotid gland is even rarer. To the best of our knowledge, we reported the first case of extraskeletal ES originating from the parotid gland in the Tunisian literature.

Case report: We report a rare case of EES of the parotid gland in a 35-year-old female. She presented with left parotid tumefaction. Physical examination revealed solid and fixed mass associated with facial paralysis. Magnetic resonance imaging illustrated a left intra-parotid process occupying the entire gland measuring 42 mm infiltrating the masseter and pterygoid muscles. The patient had a total left parotidectomy with ipsilateral triangular lymph node dissection. The definitive pathological examination and the immunohistochemical staining confirmed a primary peripheral neuroectodermal tumor or PNET with the presence of a specific EWING/PNET-type translocation in 60% of the tumor cells. She had an adjuvant chemotherapy (four cycles of vincristine, doxorubicin, cyclophosphamide alternating with ifosfamide and etoposide) followed by external radiotherapy.

Conclusion: A clinical and radiological follow-up by cervical MRI was done every 3 months and The 10-month follow-up showed no locoregional and distant recurrence.

Résumé

Introduction: Le sarcome d'Ewing est une entité maligne rare. La localisation extra osseuse en particulier la région de la tête et du cou est caractérisée par son agressivité locorégionale. Nous rapportons le cas d'un sarcome d'Ewing de la parotide. A notre connaissance, il s'agit du premier cas rapporté dans la littérature tunisienne.

Presentation du cas: Il s'agit d'une femme âgée de 35 ans qui a consulté initialement pour une tuméfaction au niveau de la glande parotide gauche. L'examen clinique a révélé une masse sous angulomandibulaire associée à une paralysie faciale périphérique gauche. Une IRM parotidienne a objectivé un processus intra-parotidien gauche occupant l'entièreté de la glande mesurant 42 mm mal limitée infiltrant modérément le muscle masséter et ptérygoïdiens. Le bilan d'extension était sans anomalie. La patiente a eu une parotidectomie gauche large avec un curage triangulaire homolatéral. L'examen anatomopathologique définitif et l'étude par hybridation in situ en fluorescence (FISH) ont confirmé la présence d'une translocation spécifique type EWING/PNET dans 60% des cellules tumorales. La patiente a été traitée par une chimiothérapie type VDC/IE (vincristine, doxorubicine, cyclophosphamide en alternance avec ifosfamide, et etoposide) suivie

[1]Department of Radiotherapy, Salah Azaiez Institute, Tunis, Tunisia
[2]El Manar Tunis University, Tunis, Tunisia

Corresponding author:
Hayfa Chahdoura, Department of Radiotherapy, Salah Azaiez Institute, 15 street houdayfa ibn el yamen Sousse, Tunis 1006, Tunisia.
Email: chahdoura_fouffa@hotmail.fr

d'une radiothérapie externe. Un suivi clinique et radiologique trimestrielle n'a montré aucune récidive locorégionale ni à distance à ce jour soit à 10 mois de recul.

Conclusion: Une surveillance clinique et radiologique trimestrielle a été faite et le contrôle à 10 mois n'a pas montré de récidive locorégionale ou à distance.

Keywords
Extraosseous Ewing's sarcoma, parotid gland, radiotherapy, salivary gland tumors, rare tumors

Keywords
Mots clés: sarcome d'Ewing eextra-osseux, glande parotide, radiothérapie, tumeurs des glandes ssalivaires, tumeurs rares

Date received: 18 November 2022; accepted: 8 March 2024

Introduction

Ewing's sarcoma is a malignant entity classified as a primary neuroectodermal tumor (PNET). The most common form is "osseous", which mainly affects young people.[1] The "extra bony" form especially in the region of the head and neck is rare and accounts for 1% to 9% of all Ewing tumors.[2] Salivary gland involvement is even rarer and more aggressive. We thus report the case of extra-skeletal Ewing's sarcoma (SEE) of the parotid gland.

To our knowledge, this is the first case reported in Tunisian literature.

Clinical case

A 35 year old woman WITH no significant past medical history. The history of her illness goes back 2 years marked by the appearance of a left parotid tumefaction. The initial histological study by biopsy revealed a mixed salivary gland tumor of 28 mm without signs of malignancy. The patient had a large resection of this mass with negative surgical margins. 6 months later, she presented with a nodule next to the surgical scar at the subangulomandibular level of 6 cm fixed firm painful on palpation without inflammatory signs associated with left peripheral facial paralysis. Examination of lymph node areas was normal. A parotid MRI revealed an expansive process measuring 42 mm, poorly limited, moderately infiltrating the masseter and pterygoid muscles with heterogeneous spontaneous signal (Figure 1) with dynamic enhancement according to a type C curve and a very low ADC (Figure 1–4).

The extension assessment made by a thoraco-abdomino-pelvic scanner and a bone scintigraphy requested in the face of bone pain, was without abnormality. The patient underwent excision of the mass with extemporaneous examination suggesting an infiltrating carcinoma from which the surgical procedure was completed by a wide left parotidectomy with ipsilateral triangular dissection and preservation of the left facial nerve. The definitive pathological examination showed an undifferentiated malignant tumor proliferation whose immunohistochimical profile suggested a primary peripheral neuroectodermal tumor or PNET. Tumor cells were CK (+) and CD99(+), on the other hand synaptophysin, EMA, NSE, chromogranin, and vimentin were negatives. The study by Fluorescence in situ hybridization (FISH) confirmed the presence of a specific EWING/PNET type translocation in 60% of the tumor cells.

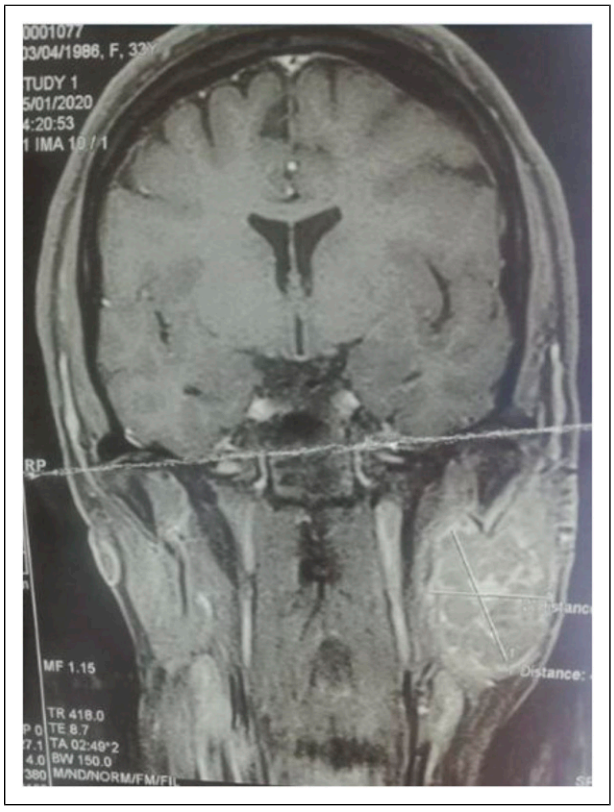

Figure 1. Cervical MRI showing the left parotid lesion in the form of a heterogeneous T2 hypersignal.

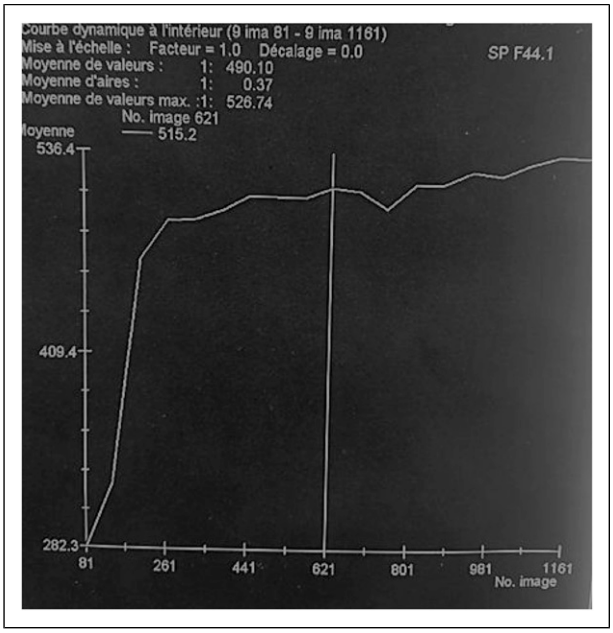

Figure 2. Diffusion MRI showing a type [C] curve related to a low ADC.

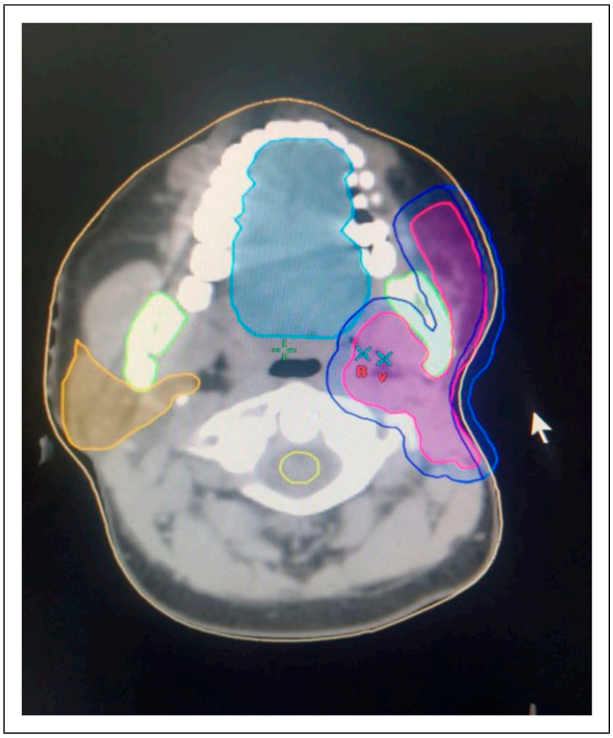

Figure 3. Target volume contouring: PTV in blue CTV in pink.

The diagnosis of extra-skeletal Ewing's sarcoma was retained. VDC/IE type chemotherapy (vincristine, doxorubicin, cyclophosphamide alternating with ifosfamide, and etoposide) was indicated followed by external radiotherapy on the operating bed delivered at a dose of 54 Gy in standard spreading and fractionation (1.8 Gy/session and 5 sessions/week). The CTV and PTV margins were 1.5 cm and 5 mm respectively (FIG.3). Treatment planning was performed on the Varian AAA 13.7 Eclipse TPS via a Linac-type linear accelerator. The tolerance of the treatment was good with maximum toxicity of grade 2 mucositis and grade 1 dermatitis which progressed well under symptomatic treatment. A clinical and radiological follow-up by cervical MRI was done every 3 months. The 10-month follow-up showed no locoregional and distant recurrence.

Discussion

First described in 1962 by Tefft et al. Ewing's extraskeletal sarcoma (EES) is a rare malignant soft tissue tumor.[3] It mainly occurs in adolescents and young adults between the ages of 10 and 30 with no gender predominance.[4] This entity can affect the soft tissues however it seems to have a predilection for the paravertebral region, the thoracic wall, the lower limbs, and the pelvis. The head and neck region is only affected in 1%–9% of cases.[2] Parotid localization is rarely observed and a few cases in the literature have been reported. To our knowledge, we report the first case published in Tunisia.

The clinical signs of parotid Ewing sarcoma are not very specific.[6] They may include a mass in the parotid gland or trismus.

Imaging, in particular CT scans and high-resolution cervical MRI, are useful in the assessment of locoregional extension, although the characteristics are not very specific to SEE.[1] MRI features of this tumor are a hyposignal T1 hypersignal T2 enhancing heterogeneously after injection of contrast product.[5]

Definitive diagnosis of SEE is based on histo-immunohistochemical data which shows proliferation of round cells with pale cytoplasm and irregular nucleus with signs of apoptosis and variable mitosis, associated with positive immunostaining with CD99, NSE, vimentin and synaptophysin.[1] The search for the translocation t (11, 22) (q22,24) is an integral part of the diagnosis, it is positive in 82 to 100% of cases depending on the series.[1] Positive labeling with CD99 constitutes a reliable and specific argument for Ewing tumors for many authors. It corresponds to the expression of a MIC2 gene located on the X and Y chromosome.[1] (Figure 4)

Few data are available on the optimal management of parotid SEE. The sequence of treatment is discussed at a multidisciplinary consultation meeting and is established according to the stage and the possibility of resectability of the tumor. The therapeutic approach is multimodal including chemotherapy, radiotherapy, and surgery leading to an overal survival (OS) at 5 years of 65% in localized ES.[6] The neoadjuvant chemotherapy associating vincristine,

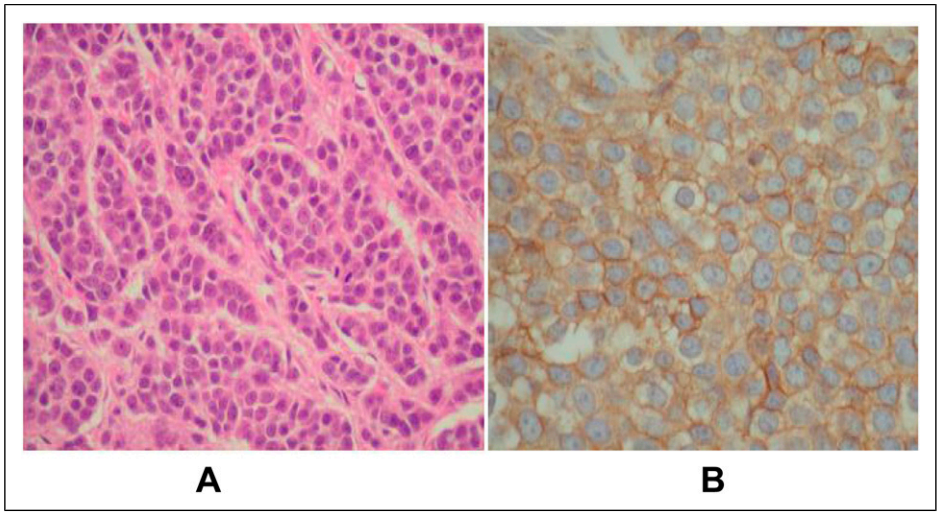

Figure 4. (A) Hematoxylin and eosin staining of tumor under high magnification microscopic field (400). Arrows show tumor cells with round nuclei and deficient cytoplasm. (B) Immunohistochemistry showing CD99 membrane positivity.

doxorubicin, ifosfamide, etoposide, and cyclophosphamide is offered as neoadjuvant for locally advanced disease to reduce tumor volume and facilitate resection.

Surgical excision alone gives poor results. The quality of the resection margins is found to be a major prognostic factor for local tumor control in most series in the literature. The local recurrence rate is significantly higher in the case of micro- or macroscopic tumor residue.[7] However, the definition of qualitative or quantitative healthy surgical margins for SEE is not well established in the literature.[8]

External radiotherapy is indicated in case of incomplete resection margins or poor response to chemotherapy. The delay between surgery and radiotherapy is 5 and 8 weeks.[9] The study of the literature shows a tendency to reduce the total dose from 70 to 75 Gy in the 80s, to 60 to 65 Gy currently,[10] recommending two dose levels the first 45 to 50 Gy in a large volume, and an additional dose of 10 to 20 Gy in a reduced volume on the residue and the tumor bed. Preoperative cervical MRI is necessary to define the target volume while including the drainage paths and being limited to the anatomical barriers such as the aponeuroses and the bone. The safety margins defining the anatomoclinical target volume are not consensual (the margins vary between 1.5 and 3 cm referring to the bony location of the head and neck region).

The association of radiotherapy and concomitant chemotherapy was still being evaluated and cannot be considered as a standard. This combination was mainly evaluated by the University of California (UCLA) team as a neoadjuvant treatment in locally advanced, inoperable high-grade sarcomas. Three-year disease-free survival and OS rates were respectively, 56.6% and 75.1%, but at the cost of high toxicity.[11] The OS was 70% for localized tumors whereas it is only 30% in metastatic patients.[12] In a retrospective analysis of 24 patients with Ewing's sarcoma of the head and neck region reported by Allam et al. most patients were treated with systemic chemotherapy plus localized radiation. The 5-year OS and disease-free survival rates were 53% and 30%, respectively, which was slightly lower than the figures reported by the Intergroup Ewing Sarcoma Study (IESS), this was likely due to the size of initial tumor (>10 cm in the majority of patients) and a low rate of compliance with chemotherapy.[13] In a series of 35 cases treated with a uniform chemotherapy protocol by Biswas et al., the 5-year event-free survival, OS, and local control rate were 55.1 ± 9.2%, 68.3 ± 8.3% and 74.1 ± 8.5%, respectively. In the largest series of 51 patients with Ewing's sarcoma of the head and neck, the most common primary sites included the skull (45%), maxilla (14%) and mandible (12%). The 3-year progression-free survival and OS rates were 74% and 87%, respectively, for patients with localized disease. Patients younger than 15 had better SES and better OS compared to patients older than 15.[14]

Conclusion

We report a rare localization of Ewing's sarcoma which is the parotid. The diagnosis is histological and immunohistochemical. These tumors represent a real therapeutic challenge. Their treatment is multidisciplinary and should be managed in a reference center by an experienced team.

Author contributions

Chahdoura Hayfa wrote the first draft of the manuscript. All authors reviewed and edited the manuscript and approved the final version of the manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Ethical statement

Ethical approval

SALAH AZAIEZ INSTITUE does not require ethical approval for reporting individual cases or case series.

Informed consent

Written informed consent was obtained from the patient(s) for their anonymised information to be published in this article.

ORCID iD

Hayfa Chahdoura https://orcid.org/0000-0001-9497-3011

References

1. Agir H, Brasch HD and Tan ST. Extra-skeletal Ewing's sarcoma of the submandibular gland. *J Plast Reconstr Aesthetic Surg* 2007; 60(12): 1345–1348.
2. Taylor Whaley J, Indelicato DJ, Morris CG, et al. Ewing tumors of the head and neck. *Am J Clin Oncol* 2010; 33(4): 321–326.
3. El Weshi A, Allam y A, Ajarim D, et al. Extraskeletal Ewing's sarcoma family of tumors in adults: analysis of 57 patients from a single institution. *Clin Oncol* 2010; 22(5): 374–381.
4. Rose JS, Hermann G, Mendelson DS, et al. Extraskeletal ewing sarcoma with computed tomography correlation. *Skeletal Radiol* 1983; 9(4): 234–237.
5. Sabr A, Aloua R, Kerdoud O, et al. Parotid Ewing's sarcoma: extra-skeletal uncommon condition. *Annals of Medicine and Surgery* 2021; 65: 102304.
6. Jyothi M, Prakash A and Shubha AM. Parotid gland ewing sarcoma in a child – a case report and review of literature. *Pediatric Hematology Oncology Journal* 2020; 5(3): 115–118. DOI: 10.1016/j.phoj.2020.06.013
7. Tural D, Mandel NM, Dervisoglu S, et al. Extraskeletal Ewing's sarcoma family of tumors in adults: prognostic factors and clinical outcome. *Jpn J Clin Oncol* 2012; 42(5): 420–426.
8. Qureshi SS, Laskar S, Kembhavi S, et al. Extraskeletal ewing sarcoma in children and adolescents: impact of narrow but negative surgical margin. *Pediatr Surg Int* 2013; 29(12): 1303–1309.
9. Lesimple T, Voigt J-J, Bataillard A, et al. Guidelines for clinical practice: standards, options and recommendations 2002 for the diagnosis of carcinomas of unknown primary site. *Bull Cancer* 2003; 90(12): 1071–1096.
10. Alektiar KM, Leung D, Zelefsky MJ, et al. Adjuvant brachytherapy for primary high-grade soft tissue sarcoma of the extremity. *Ann Surg Oncol* 2002; 9(1): 48–56.
11. Hadj I. *EWING's soft tissue sarcoma*. Rabat; Faculty of Medicine and Pharmacy Rabat. M0362009 Available at: https://ao.um5s.ac.ma/xmlui/handle/123456789/730
12. Grevener K, Haveman LM, Ranft A, et al. Management and outcome of ewing sarcoma of the head and neck: ewing sarcoma of head-neck, outcome and treatment. *Pediatr Blood Cancer* 2016; 63(4): 604.
13. Ayman ALLAM, EL-Husseiny GAMAL, Khafaga YASSER, et al. Ewing's sarcoma of the head and neck: a retrospective analysis of 24 cases. *Sarcoma* 1999; 3(1): 11.
14. Khosla D, Verma S, Punia RS, et al. MD1"Extraosseous Ewing's sarcoma of the parapharyngeal space - a rare entity - with review of literature. *Iranian Journal of Otorhinolaryngology* 2019; 31(102): 51–54.