STUDENTS' CORNER
CASE REPORT

Extra skeletal Ewing's sarcoma in the parapharyngeal space: A rare case report

Talha Abbas[1], Muhammad Asfandyar Nadir[2], Armaghan Ur Rehman[3], Irshad Malik[4], Muhammad Umair Wahab[5], Maham Masood[6]

Abstract

Ewing's sarcoma (ES) is a tumour commonly seen in children and usually affects the long bones. Its presence in the soft tissues of the parapharyngeal space is exceptionally rare, with only 29 cases reported in the literature so far. We report the case of a 21-year-old male with Extra skeletal Ewing's Sarcoma (EES) in the parapharyngeal space, who presented with complaints of dysphagia and submandibular swelling displacing the tonsil and uvula. Despite normal systemic examinations, initial Fine Needle Aspiration Cytology (FNAC) suggested a benign cystic lesion, probably a pleomorphic adenoma. However, an excisional biopsy revealed malignant sheets of cells consistent with ES, confirmed by immuno-histochemistry (IHC), showing NKX2.2 positivity which is a specific marker for ES. This case, being the first reported from Pakistan, emphasises the diagnostic challenge posed by rare presentations of EES in unusual locations and highlights the critical role of biopsy for accurate diagnosis.

Keywords: Ewing's Sarcoma, Parapharyngeal space, Head and Neck Neoplasm.

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Introduction

Ewing's Sarcoma (ES) is a "small blue cells" tumour resembling peripheral neuroectodermal tumours (PNETs) in its histology but differs in neuroectodermal differentiation.[1] The molecular genetics of ES are quite variable, with different possible translocations. Of these, t(11;22) (q24; q12) is the most common, occurring in approximately 85% of the cases, whereas t (21;22) (q22; q12) is seen in 10% of the cases. Every other translocation is present in less than 5% of the cases.[2] ES is quite rare in the bones and soft tissues of the head and neck, and accounts for less than 1% of head and neck tumours.[3] Around 80% of the cases involve individuals younger than 18 years of age, with the most common location being the long bones of the lower extremities, such as the femur.[4] This case of Extraskeletal Ewing Sarcoma (EES) in a 21-year-old male is noteworthy due to its unusual presentation and initial benign appearance on Fine Needle Aspiration Cytology (FNAC). This case is important as it highlights a rare and diagnostically challenging presentation of EES in an unusual anatomical location. Given that it is the first reported case of ES in the parapharyngeal space in Pakistan, it contributes valuable insight into its clinical and pathological characteristics, aiding in early recognition and management of similar cases in the future.

Case Report

A 21-year-old male with no prior medical or surgical history presented in the Ear, Nose and Throat Department of Jinnah Hospital, Lahore, Pakistan, with complaints of dysphagia for 15 days and swelling on the right side of the oropharynx for approximately three months. The case first presented on July 23, 2024. Upon arrival at the department, the patient was conscious, afebrile, and alert with stable vital signs.

Examination revealed a right submandibular swelling, approximately 2x2cm in size, soft in consistency, with mild tenderness, but no erythema. Onset of the swelling was gradual, progressive, and persistent, with no aggravating or relieving factors. The overlying skin was mobile, and there was no cervical lymphadenopathy. The swelling pushed the tonsil anteriorly and deviated the uvula to the contralateral side, with no difficulty in breathing, change in voice, or weight loss.

Initial laboratory tests revealed no hepatic, renal, or haematologic abnormalities. A contrast-enhanced computed tomography (CECT) scan revealed a well-defined soft tissue lesion measuring 7.8 x 3.8 x 5.3cm in the right parapharyngeal space. The lesion extended superiorly up to the right pterygoid plate and abutted the tongue from the right mandible laterally. Inferiorly, it was

[1-3]4th Year MBBS Student, Allama Iqbal Medical College, Lahore, Pakistan; [4-6]Department of Otorhinolaryngology, Allama Iqbal Medical College, Lahore, Pakistan.

Correspondence: Maham Masood. e-mail: mahammasood2@hotmail.com
ORCID ID: 0009-0002-6617-7637

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inseparable from the right submandibular gland. Medially, it was bulging into the oropharynx and resulting in narrowing the lumen. There were no signs of invasion of the neighbouring soft tissues or bony erosions. A chest X-ray revealed no abnormalities. FNAC revealed a haemorrhagic aspirate and on repetition revealed a benign cystic lesion likely to be a pleomorphic adenoma.

This was followed up with an excisional biopsy of the mass via a transoral approach under general anaesthesia. The mass was removed in toto, preserving the surrounding soft tissue structures and nerves and no lymph nodes were removed. The patient remained stable throughout the procedure and was discharged on antibiotics and analgesics, and advised to visit after one week for follow-up.

The excised mass was sent for histopathology. On gross examination the mass appeared grey-white, firm, solid, and cystic and weighed 26grams. Histopathology revealed sheets of malignant round blue cells with salt-and-pepper chromatin and no necrosis consistent with ESS (Figure 1). Immunohistochemistry (IHC) was positive for NKX2.2, a specific marker of EES, confirming the diagnosis (Figure 2). Although the initial FNAC results suggested a benign lesion, they were later contradicted by the histopathology and IHC results.

At the one-week follow-up, the patient was stable with no complaints. A CECT of the chest, abdomen, and pelvis showed no signs of metastases or aggressive lytic bone lesions. Given the diagnosis of EES, the patient was referred for oncological evaluation to assess the need for adjuvant therapy, including chemotherapy and radiotherapy. Currently, the patient is under observation with no treatment.

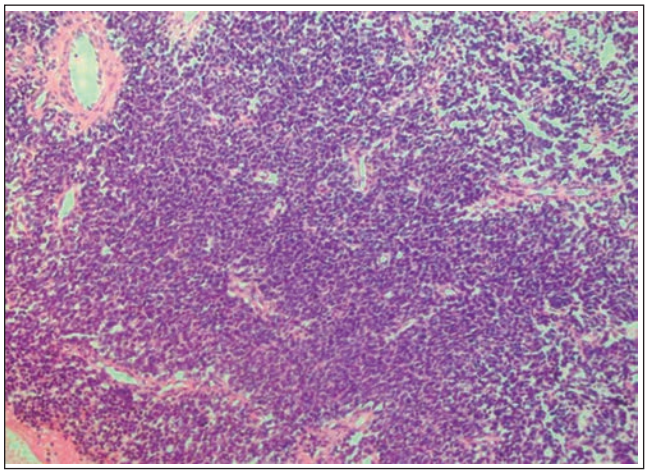

Figure-1: Biopsy showing malignant round tumour cells.

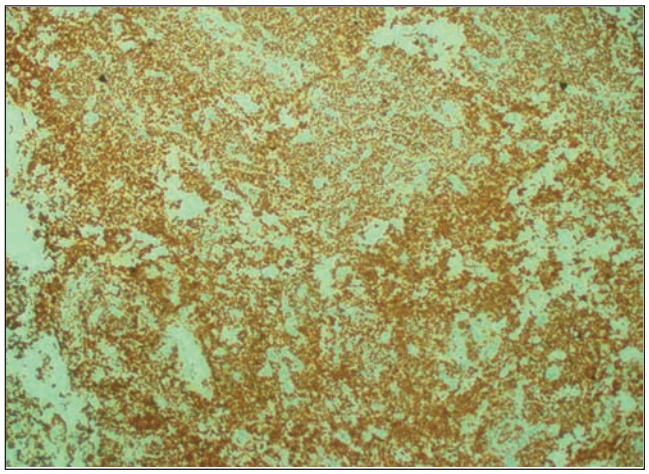

Figure-2: NKX 2.2 immunohistochemistry with strong positivity in tumour cells.

Discussion

Cancers in the head and neck region are uncommon, accounting for only 7.6% of global cancers and 4.8% of cancer-related deaths worldwide. Even rarer are cancers of the parapharyngeal space, representing just 0.5% of head and neck cancers.[5] Common malignancies in this space include salivary gland tumours, such as pleomorphic adenomas, and neurogenic tumours, like schwannomas.[5,6] In the current study, the initial FNAC yielded unremarkable results, complicating diagnosis. When a benign cystic lesion was detected, it was not seriously considered. However, the definitive diagnosis of EES came after an excisional biopsy and histopathological analysis. IHC results further complicated the case, as the tumour was CD99 negative and NKX2.2 positive, whereas over 80% of typical EES cases are CD99 positive. The NKX2.2 positivity, though common in EES, is also seen in other tumours, limiting its specificity as a sole diagnostic marker.[7]

In Pakistan, primary bone sarcomas represent 2.2% of all cancers in males and 1.1% in females, with Ewing sarcoma accounting for only 23.9% of the cases.[8] Ewing sarcoma in the head and neck region is exceptionally rare, representing only 1% to 4% of the cases. The tumour typically affects the bones of the lower extremities (45%), followed by the pelvis (20%), upper extremities (13%), axial skeleton and ribs (13%), and face (2%).[3] A comprehensive literature search revealed fewer than 20 cases of EES in the parapharyngeal space, and none were reported from Pakistan, making this the first documented case from the country.

The patient's demographic profile aligns with typical Ewing sarcoma cases, since, he was a 21-year-old male, within the common mean age of 18.9±3.2 years, which predominantly affects male.[9] Initially, the patient experienced a small, benign-appearing lesion, which quickly progressed to a

mass occupying the oral cavity over three months. This rapid progression contrasts with the common genetic causes of Ewing sarcoma, such as the (11;22) (q24; q12) balanced reciprocal translocation seen in osseous variants.[2] However, in this case, the variant was extra-skeletal, with different pathogenic characteristics.

There is no well-established link between EES and environmental risk factors, drug exposure, radiation history, or family cancer history, as seen in other malignancies. This report hints at other non-genetic factors potentially contributing to the sporadic onset of the disease, though further research is needed to clarify these mechanisms. Additionally, the case underscores the lack of public awareness about early signs of malignancy, such as persistent swelling in the oral cavity, which the patient ignored. This behaviour reflects broader public health challenges in Pakistan, including poor healthcare education and accessibility.

Several limitations of this case are acknowledged. The uniqueness of this case limits the generalisability of the findings. Conclusions cannot be widely applied to other patients or populations. Further studies involving larger patient cohorts are necessary to validate these findings and explore their applicability in broader contexts. Additionally, the authors recognise that personal clinical perspectives may have influenced the interpretation of the data, emphasising the need for further research and diverse viewpoints. Lack of specific details on tumour grade and stage also restricted the ability to assess the full severity and prognosis of the disease.

Conclusion

This case report documents the first known case of EES in the parapharyngeal space in Pakistan. The diagnostic challenges in this case, including inconclusive FNAC results and the atypical IHC profile, highlight the complexity of diagnosing EES. Despite these hurdles, accurate diagnosis through biopsy and IHC played a crucial role. Further research is needed to improve the understanding and management of such unusual tumour presentations.

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Author Contribution:
TA: Concept, writing-original draft and data analysis.
MAN & AUR: Writing original draft.
IM: Writing, review, editing and data analysis.
MUW & MM: Writing, review and editing.