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The Gulf Journal of Oncology

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Primary Non-Hodgkin Lymphoma Of Frontal Sinus Diagnosed By Fine Needle Aspiration Cytology

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Abstract

We present a rare case of primary non-Hodgkin Lymphoma of the frontal sinus diagnosed by Fine needle aspiration cytology (FNAC). FNAC is a safe, simple, rapid and effective technique that could be used to diagnose lesions even in unusual sites like paranasal sinuses with effective radiological guidance. Neoplasms of the frontal sinus could be easily misdiagnosed as an inflammatory process clinically. FNAC is a simple test to rule out a neoplasm. A review of a single case including radiographic, clinical, and pathologic findings was done, followed by a discussion on the pathological differential diagnosis highlighting relevant literature. Timely diagnosis is critical in the management of these cases.

Keywords:
Fine needle aspiration cytology, non- Hodgkin lymphoma, diffuse large B cell lymphoma, frontal sinus.

Introduction

Primary non-Hodgkin lymphoma (NHL) of the nasal cavity or paranasal sinuses is defined as lymphoid cell neoplasms in which the bulk of disease occurs in these anatomic sites(1). Primary lymphoma of paranasal sinuses is a rare entity. Most cases are reported to occur in the maxillary sinuses, ethmoid sinuses and nasal cavity. Primary involvement of the frontal sinus is very rare (2, 3). In this report, we present a case of primary B-cell non-Hodgkin lymphoma of the frontal sinus in a 49-year-old Kuwaiti man which was diagnosed on fine needle aspiration cytology. To the best of our knowledge, primary non-Hodgkin lymphoma of the frontal sinus diagnosed by FNAC has not been previously reported.

Case Report

A 49- year- old obese Kuwaiti man presented with frontal headache and a swelling in the left frontal region for the past two months. He had received several courses of antibiotics and analgesics without much relief. He was on medications for diabetes, hypertension, hypercholesterolemia, gastric ulcer and atrial fibrillation. He was not a smoker, alcoholic or a recreational drug user. There was no history of loss of weight or appetite. He was afebrile. Local examination revealed a tender swelling in the left forehead region.

Computed tomography (CT) scan of paranasal sinuses and brain revealed a soft tissue density lesion in left frontal sinus with erosion of its bony margins. Whole body Positron emission tomography (PET) scan (18F-FDG) showed a hypermetabolic lesion involving the frontal sinus. Bone scan (99m Tc- HDP) showed increased uptake in the left frontal bone. Fine needle aspiration (FNA) was done with a 24 gauge needle under ultrasound guidance. Two needle passes were made. The aspirated material was processed as air-dried direct smears for Diff-quick stain and as ethanol-fixed smears for papanicolaou staining. A cell block was also made for immunohistochemical studies.

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On microscopic examination, the FNA smears were cellular, comprising of a predominant population of dispersed large lymphoid cells resembling centroblasts and immunoblasts. The cells have round, multi-lobated or irregularly folded nuclei with prominent nucleoli. A second population of medium sized lymphoid cells was also seen. Occasional mitotic figures were seen. The cells stained strongly positive for leukocyte common antigen and were negative for chromogranin, pan cytokeratin, S 100, HMB 45 and glial fibrillary acidic protein (GFAP).

A diagnosis of diffuse B-cell non-Hodgkin Lymphoma of frontal sinus was entertained.

A biopsy of the lesion was done for confirmation. Microscopy showed diffuse large atypical lymphoid cells which expressed CD 20, bcl 2 and CD 45 and were negative for cytokeratin, epithelial membrane antigen, CD 30, CD 10, CD 15, CD 3 and CD 5. Ki 67 was positive in 70% of cells. A diagnosis of diffuse large B cell lymphoma of the frontal sinus was rendered.

Figure 1: Positron emission tomography scan showing a hypermetabolic lesion in the left frontal sinus.

Figure 2: Photomicrographs showing a round cell neoplasm (Diff-Quick, x400)

MRI brain of the patient was done after three weeks from the date of surgical biopsy. This lesion involving the left frontal sinus was seen as a relatively well defined soft tissue lesion measuring 3.5 x 1.1 x 2.3 cm. The lesion displayed hypointense signal in T1W sequence, intermediate signal intensity in T2W and FLAIR sequences to enhance homogenously in the post contrast scan. The lesion was seen to extend anteriorly into the soft tissues in the forehead and caused a mild indentation of the duramater, yet with no evidence of abnormal lepto-meningeal enhancement. Brain parenchyma showed no focal mass lesion.

Whole body CT scan done for staging showed no significant lymphadenopathy or organomegaly. Bone marrow aspiration and trephine biopsy were negative for malignant infiltrate. Cerebrospinal fluid examination revealed no immature cells. Immunoglobulin level, beta 2 microglobulin level, Prostate specific antibody level and
coagulation profile was normal. HIV 1, HIV 2, HBsAg and Anti HCV antibodies were negative. Serum protein electrophoresis showed a normal pattern. Complete blood count was in normal limits. Eastern Cooperative Oncology group performance status was ECOG PS-1.

The patient received four cycles of R-CHOP (Rituximab with cyclophosphamide, doxorubicin, vincristine, and prednisone) and four injections of intrathecal methotrexate. He also received involved field radiotherapy to the left frontal sinus to a total dose of 40 Gy given in 20 fractions. PET scan done a month later showed no metabolically active lesion. ECOG performance status was ECOG PS-1. Complete blood count was also within normal limits. The patient is on remission for the past ten months post chemoradiotherapy. The patient is on follow up.

Discussion

Malignancies of the paranasal sinuses are commonly of epithelial origin, which include squamous cell carcinoma, adenocarcinoma, and adenoid cystic carcinoma. Primary non-Hodgkin lymphoma (NHL) of the paranasal sinuses is quite rare, representing 2.5% of all extranodal NHLs \(^1\). Most frequent sites of involvement in the sinonasal tract include maxillary antrum, nasal cavity and ethmoid sinus \(^4\). Tumors in the frontal sinus are more often extensions from the ethmoid sinus than of primary origin. Primary tumors of the frontal sinus are most often adenocarcinomas of the seromucous glands. Primary lymphoma of frontal sinus is very rare \(^2,3\). Neoplasms of the frontal sinus can be easily misdiagnosed as inflammatory \(^5\). FNA is an easy method of diagnosing the neoplasms. Early diagnosis and prompt treatment improve patients’ outcomes.

HL of paranasal sinus is primarily a disease of adults with male predominance. In the paranasal sinuses, B cell lymphomas (mostly diffuse large B-cell lymphoma) are more common than the NK/ T or T cell lymphomas in both western and Asian series. In the nasal cavity NK/T or T cell lymphomas are more common than B cell lymphomas \(^1\). Children may rarely present with NHL of the nasal cavity and the paranasal sinuses, with Burkitt lymphoma being the most common type. The etiology is unknown, but extranodal NK/T cell lymphoma of nasal-type is strongly associated with Epstein-Barr virus. There is only a weak association between B-cell lymphomas in the nasal cavity and the paranasal sinuses with EBV. The prognosis is slightly more favorable for diffuse large B-cell lymphoma (DLBCL) as compared with extranodal NK/T cell lymphoma of nasal-type. The overall survival for sinonasal DLBCL is 35-60 %\(^1\).

Cytodiagnosis of lymphoma at extranodal location is particularly challenging as one needs to take into consideration various other small round cell tumors which exhibit similar morphology. The differential diagnosis for small round cell tumors of the sinonasal tract includes sinonasal lymphoma, sinonasal undifferentiated carcinoma, small cell undifferentiated (neuroendocrine) carcinoma, undifferentiated (lymphoepithelioma-like) carcinoma, melanoma, olfactory neuroblastoma (esthesioneuroblastoma), Ewing sarcoma/peripheral neuroectodermal tumor, rhabdomyosarcoma, pituitary adenoma, mesenchymal chondrosarcoma, small cell osteosarcoma, synovial sarcoma and extramedullary plasmacytoma\(^6\).

A clinico-radiological correlation and careful morphological studies must be supported with immunocytochemical studies for an appropriate diagnosis. DLBCL is positive for CD 20 and CD 79a. NK/T cell lymphomas are positive for CD 3, CD56 and Epstein-Barr virus. Ewing’s sarcoma/primitive neuroectodermal tumor, malignant melanoma, undifferentiated carcinoma, rhabdomyosarcoma, olfactory neuroblastoma and small cell neuroendocrine carcinoma can be differentiated by the expression of CD99, HMB 45, cytokeratin, Myo D1, synaptophysin and CD 56 respectively. In the present case, immune stain done on the cell block preparation demonstrated expression of leukocyte common antigen, and helped in establishing the diagnosis of lymphoma. This was subsequently confirmed as diffuse large B cell lymphoma on histopathological examination of the excised lymph node which revealed expression of CD20.
Conclusion

We report a rare case of primary non-Hodgkin lymphoma of the frontal sinus, diagnosed on fine needle aspiration cytology. The case highlights the utility of FNA as an early diagnostic modality for tumors arising from paranasal sinuses. It also underscores the importance of early diagnosis of these lymphomas.

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References