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Case Report

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A Case of Diffuse Large B-Cell Lymphoma of Frontal Sinus Mimicking Pott's Puffy Tumor

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ABSTRACT

Diffuse large B-cell lymphoma (DLBCL) is the most common type of Non-Hodgkin Lymphoma (NHL). The primary NHL of the nasal cavity and paranasal sinuses are extremely rare, hence causing diagnostic and therapeutic difficulties. We present the case of a 53-year-old woman with 1 week history of left frontal headache followed by swelling over left frontal region. She was initially treated as left frontal sinus Pott's Puffy Tumour based on clinical and radiological investigation. Biopsy was taken and histopathological investigation revealed high grade DLBCL of left frontal sinus. She was then referred to haematology department for chemotherapy. Eventually, she succumbed due to progression of disease. In conclusion, an early diagnosis of DLBCL of the frontal sinus is difficult as it is often confused with other nasal pathologies and causes a delay in treatment.

Introduction

Lymphomas are malignant tumours of lymphocytes, broadly classified into Hodgkin's lymphoma and non-Hodgkin's lymphoma (NHL), and can involve lymphoid tissue as well as extranidal sites [1]. Primary NHLs of the nasal cavity and paranasal sinuses are rare, most commonly affecting the maxillary sinus, with frontal sinus involvement being exceptionally uncommon (0.17–1.63% of cases) [2]. Among subtypes, diffuse large B-cell lymphoma (DLBCL) is the most frequent NHL worldwide and the predominant form affecting the sinonasal region.

Sinonasal lymphomas often present with non-specific symptoms such as nasal obstruction, rhinorrhoea, epistaxis, or ocular manifestations, which can mimic benign conditions and delay diagnosis. In rare cases, frontal sinus involvement may resemble Pott's puffy tumour, a complication of frontal sinusitis characterized by osteomyelitis and subperiosteal abscess formation [3]. Accurate diagnosis relies on imaging and histopathology, as clinical presentation alone may be misleading.

This report presents a rare case of DLBCL of the frontal sinus initially treated as Pott's puffy tumour, highlighting the need for early recognition and biopsy in atypical frontal sinus lesions.

Case Presentation

A 53-year-old Malay lady with underlying hypertension was referred from Klinik Kesihatan for left frontal swelling to rule out abscess. She presented with history of left frontal headache for 1 week followed by swelling over left frontal region. She described the pain as dull in nature, intermittent and relieved with analgesic. She denied any chronic rhinosinusitis symptoms – rhinorrhoea, nasal blockage, anosmia or hyposmia, facial pain, or epistaxis. She also denied any history of fall or trauma to the head and no history of nasal surgery done previously.

On examination, she had facial tenderness over left forehead with swelling over left frontal region measuring 3x3cm, firm, non mobile, no skin changes, mild tender on palpation. Extraocular movement was normal, no proptosis, no neck swelling or lymph node palpable and no neck stiffness.

We proceeded with direct Naso endoscopy which revealed bulging over axilla of left middle turbinate, no mucous seen and right nasal cavity was clear.

Blood investigations taken were normal. Skull Xray was done in Klinik Kesihatan showed no abnormality.

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Patient was initially diagnosed as infected left frontal sinus Pott's Puffy Tumor and was started on intravenous ceftriaxone in ward. Contrast enhanced CT of paranasal sinus was done on the next day and revealed frontal sinus lesion (measuring 0.6x2.1x2.7cm) with subgalea, left nasal and intracranial extension with differential diagnosis of Pott's Puffy Tumor.

We proceeded with Examination under anesthesia, left ungiectomy, deroofing of left frontal mucocele and biopsy under general anesthesia. Intraoperatively, left frontal sinus had edematous mucosa with soft tissue obstructing at left frontal recess and noted inspissated pus discharge upon deroofing of left frontal tissue. Biopsy was taken and sent for HPE.

Biopsy from left frontal recess tissue and left frontal sinus tissue revealed high grade B-cell lymphoma, consistent with diffuse large B-cell lymphoma (DLBCL), non-GCB subtype.

Patient was referred to hematology department for chemotherapy and further management. However, she succumbed to progression of disease after started on chemotherapy.

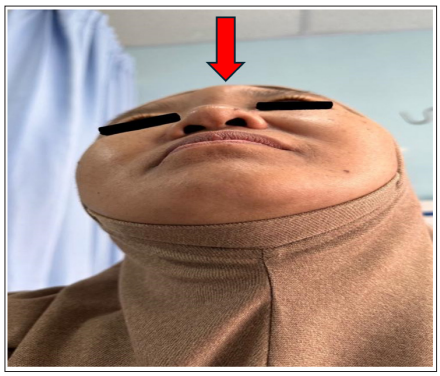

Figure 1

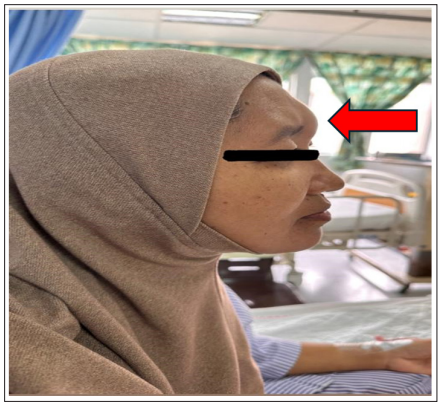

Figure 2

Figure 3

Figure 1, 2 and 3: Red arrow in showed swelling over left frontal region

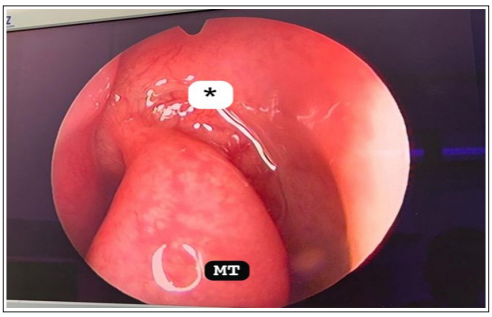

Figure 4: Bulging over axilla of left middle turbinate (MT) as shown by the asterisk

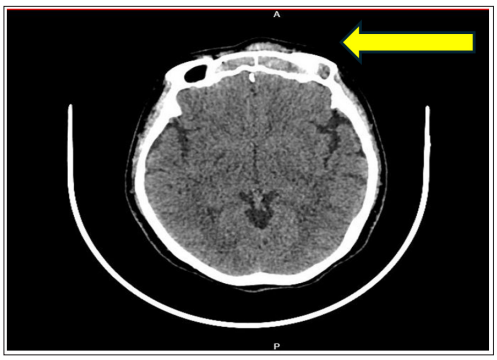

Figure 5

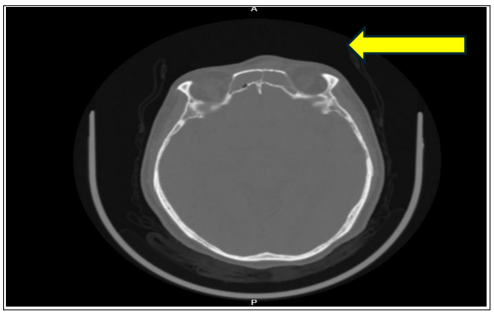

Figure 6

Figure 5 and 6: CECT paranasal sinus showing bilateral frontal sinus lesion with bony erosion as pointed by yellow arrow

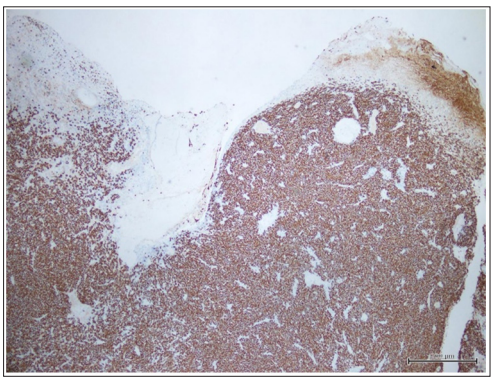

Figure 7

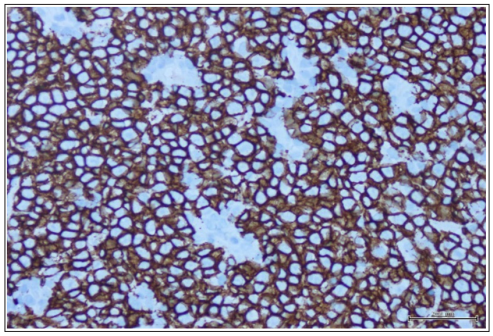

Figure 8

Figure 7 and 8: Histopathological examination revealed the neoplastic lymphoid cells show positivity to CD20

Discussion

Lymphoma encompasses a heterogeneous group of malignant disorders arising from lymphocytes, comprising more than 90 recognized subtypes which can involve lymphatic tissue, bone marrow, or extranodal sites. It can be divided into Hodgkin's Lymphoma and Non-Hodgkin's Lymphoma.

Primary NHLs of the nasal cavities and paranasal sinuses are extremely rare and most cases occur in the maxillary sinus, followed by the ethmoid and the nasal cavity. Only 0.17–1.63% of all lymphomas affect the frontal sinus. Diffuse large B-cell lymphoma (DLBCL) represents the most common type of Non-Hodgkin's Lymphoma worldwide, accounting for approximately 30–40% of all cases and it is the most common sub-type of lymphoma involving the sinonasal tract.

Presenting symptoms are usually non-specific and patient can present with acute sinusitis with or without diplopia, rhinorrhea, nasal obstruction, epistaxis, exophthalmos, and proptosis. Hence, sinonasal lymphomas are often confused with more common benign nasal conditions, leading to delayed diagnosis and treatment.

Pott's puffy tumour (PPT) originally reported by Sir Percival Pott in the 18th century, refers to a forehead edema resulting from osteomyelitis of the frontal bone with associated subperiosteal abscess. The word tumor represented one of the four components of inflammation described by Aulus Cornelius Celsus - rubor (redness), tumor (swelling), calor (warmth), and dolor (pain) [4]. The tumor in this case refers to the observable swelling of the forehead, rather than to any neoplasia.

When originally described, it was thought to be caused by a complication from direct trauma to the forehead. It is now known that it most frequently occurs as a complication of frontal sinusitis, most commonly seen in young adolescents. It is characterized by a circumscribed, tender swelling at the forehead presenting with other associated signs and symptoms including fever, headache, nasal discharge, or increased intracranial pressure. Imaging should be done as soon as Pott's Puffy Tumour is suspected, as it is important to determine the prognosis and helps in guiding the acute management. The choice between Magnetic Resonance Imaging (MRI) and Contrast-Enhanced Computed Tomography (CECT) depends on the physician's clinical judgement, the specific diagnostic goals and the availability of the imaging machine in the centre. CECT is used to assess air-bone interfaces and any frontal bone or skull involvement, while MRI can provide detailed imaging of soft tissue anomalies.

In this case, we initially treated the patient as left frontal sinus Pott's Puffy Tumour based on the presenting complaints, nasal endoscopy findings and radiological findings, which we started her on intravenous ceftriaxone in ward [5]. Referral to haematology department was made after the histopathology report was available, hence we revised the diagnosis to DLBCL of left frontal sinus.

It is important to take biopsy in patient presented with frontal swelling and evidence of mass from the scope findings as to get the correct diagnosis for the patient and to ensure correct treatment is given. Early diagnosis and treatment of this condition are crucial for optimal outcomes.

Conclusion

Sinonasal lymphomas, particularly diffuse large B-cell lymphoma involving the frontal sinus, are extremely rare and often present with non-specific symptoms that closely mimic benign inflammatory conditions such as sinusitis or Pott's puffy tumour. This overlap in clinical and radiological features can lead to misdiagnosis and delayed definitive treatment. The present discussion highlights the importance of maintaining a high index of suspicion when evaluating patients with frontal swelling and sinonasal masses. While imaging plays a vital role in initial assessment and management, histopathological confirmation remains essential for establishing an accurate diagnosis. Early biopsy and multidisciplinary involvement are crucial to ensure timely initiation of appropriate therapy, thereby improving patient outcomes.

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