



DIFFUSE LARGE B-CELL LYMPHOMA MIMICKING A POTT'S PUFFY TUMOUR – A RARE CASE OF NASAL AND FRONTAL SINUS TUMOUR

Chłoniak rozlany z dużych limfocytów B imitujący guza Potta – rzadki przypadek nowotworu jam nosa oraz okolicy zatok czołowych



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Abstract

In this article, we present a case report of a 50 year-old patient with forehead oedema, who was admitted during emergency duty to Otorhinolaryngology Clinic. Based on clinical presentation and diagnostic imaging, he was initially diagnosed with Pott's puffy tumour. Conservative treatment was performed with slight improvement. The patient was qualified to remove the forehead lesion and to send tissue specimens from the right nasal cavity for histopathological examination. A diffuse large B-cell lymphoma was diagnosed based on histopathological findings, and therefore he was referred to further diagnosis and haematological treatment.

Streszczenie

W artykule opisujemy przypadek kliniczny 50-letniego mężczyzny, który został przyjęty w trybie ostrodyżurowym do Kliniki Otorhinolaryngologii z powodu egzofitycznej zmiany w okolicy czołowej. Na podstawie objawów klinicznych oraz badań obrazowych wstępnie rozpoznano guz Potta. Wdrożono leczenie zachowawcze, uzyskując niewielką poprawę. Pacjenta zakwalifikowano do usunięcia zmiany z okolicy czołowej oraz pobrania wycinków z prawej jamy nosa w celu weryfikacji histopatologicznej. W badaniu histopatologicznym rozpoznano chłoniak rozlany z dużych limfocytów B, w związku z czym chory został skierowany do dalszej diagnostyki i leczenia hematologicznego.

Keywords: Pott's puffy tumour, DLBCL, sinusitis

Słowa kluczowe: guz Potta, DLBCL, sinusitis

DOI 10.53301/lw/175811

Received: 15.11.2023

Accepted: 24.11.2023

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Introduction

Lesions located in the frontal sinus region may be caused by a number of factors, and their heterogeneous clinical picture poses a diagnostic challenge. A Pott's puffy tumour is defined as a swelling of the skin and soft tissues of the frontal region or a subperiosteal abscess associated with frontal bone osteomyelitis, which most commonly develops as a complication of acute or chronic frontal sinusitis, trauma to the frontal region, surgical interventions involving the forehead, dental infection or cocaine abuse [1–4]. Diffuse large B-cell lymphomas (DLBCLs) are rare, particularly those located in the nasal cavity and paranasal sinuses [5]. They give non-specific symptoms, which often results in a primary misdiagnosis

and a delay in implementing appropriate treatment [6]. The paper presents a clinical case of an initially suspected Pott's puffy tumour in a patient diagnosed with DLBCL during further diagnosis.

Case report

A 50-year-old patient admitted as an emergency to the Department of Otorhinolaryngology due to a raised, hard exophytic lesion on the forehead. The lesion developed spontaneously about one month prior to admission, and was accompanied by purulent-mucous nasal discharge. Computed tomography (CT) of the head raised a suspicion of Pott's puffy tumour. The patient reported a history of sneezing and chronic watery rhinitis for one

year. He was treated with an intranasal corticosteroid by an internal medicine physician, achieving temporary improvement. After some time, however, he observed thick, purulent nasal discharge and was referred to an otolaryngologist with a suspicion of chronic sinusitis. Intranasal mupirocin was continued for 10 days with little improvement. During intranasal antibiotic therapy, a watery discharge appeared from the left nasal cavity on tilting the head, accompanied by a sensation of distension in the right and left frontal sinuses. A CT scan of the sinuses was performed, which, apart from the deviation of the nasal septum, was unremarkable. After two months, the patient observed foul-smelling discharge from the right nasal cavity. The ENT specialist started amoxicillin with clavulanic acid and fluconazole orally for 7 days, with temporary improvement. After one month, a swab was taken from the right nasal cavity due to symptom recurrence. *Escherichia coli* and *Staphylococcus aureus* were grown. Intranasal mupirocin and steroid were initiated, leading to improvement. Two months later, the patient noticed a sudden appearance of a growing nodule in the forehead. He was referred to a dermatologist, who ordered an ultrasound of the lesion. US findings were as follows: 'A hypoechoic area of 6 × 28 × 27 mm (AP × RL × SI), without evident blood flow, relatively well-delineated, is present in the midline, subperiosteally at the anterior lamina of the frontal bone. The image may correspond to a Pott's puffy tumour'. A repeat CT scan of the sinuses showed, among other things 'a soft-tissue lenticular focus is with a size of 27 × 9 mm (T × AP), vertical dimension about 25 mm, located in the frontal region in the midline. Mural mucosal thickening of up to 5 mm in the frontal sinuses. A 11 × 5 × 10 mm area of thinning of the bone structure, with significant thinning of the cortical layer of bone, within the anterior wall of the frontal sinuses – CT image corresponds to Pott's puffy tumour. The posterior wall

of frontal sinus without features of bone destruction. Significant thickening/overgrowth of the right inferior nasal concha with significant narrowing of the inferior and middle nasal passages'. The patient presented with the above findings to the reference emergency department of otolaryngology at the Military Institute of Medicine – National Research Institute. On admission, endoscopic examination of the nasal cavities revealed a polypoid swelling of the middle and lower right concha, accompanied by a profuse purulent-mucous discharge, located behind the spike of the nasal septum. In the frontal region: a hard, raised, spherical, non-painful, non-movable exophytic lesion with unchanged colour. On admission, contrast-enhanced (fig. 1) and non-contrast-enhanced (fig. 2) CT scan of the paranasal sinuses was performed, showing: 'A solid focal lesion measuring 35 × 12 × 40 mm, undergoing slightly heterogeneous contrast enhancement, located medially at the outer lamina of the frontal bone at the level of the frontal sinus; at this level, thinning of the frontal bone with small defects of the cortical layer, without features of spreading infiltration to the anterior cranial fossa, a small thickening of the mucosa in the frontal sinuses and the maxillary sinus'. A culture was taken from the right nasal cavity. Empirical antibiotic therapy with ceftriaxone and metronidazole, intravenous corticosteroid and xylometazoline to both nasal cavities was initiated. Based on culture findings and the antibiogram (*Staphylococcus aureus* sensitive to cloxacillin), treatment with cloxacillin was initiated. A follow-up CT scan performed after one week of treatment showed a reduction of the exophytic lesion on the forehead. The patient was discharged home with the recommendation of intranasal corticosteroid. At a follow-up visit, the patient reported that the lesion had grown after treatment completion and was deformable under pressure. He was scheduled for surgery under general anaesthesia. An external ex-

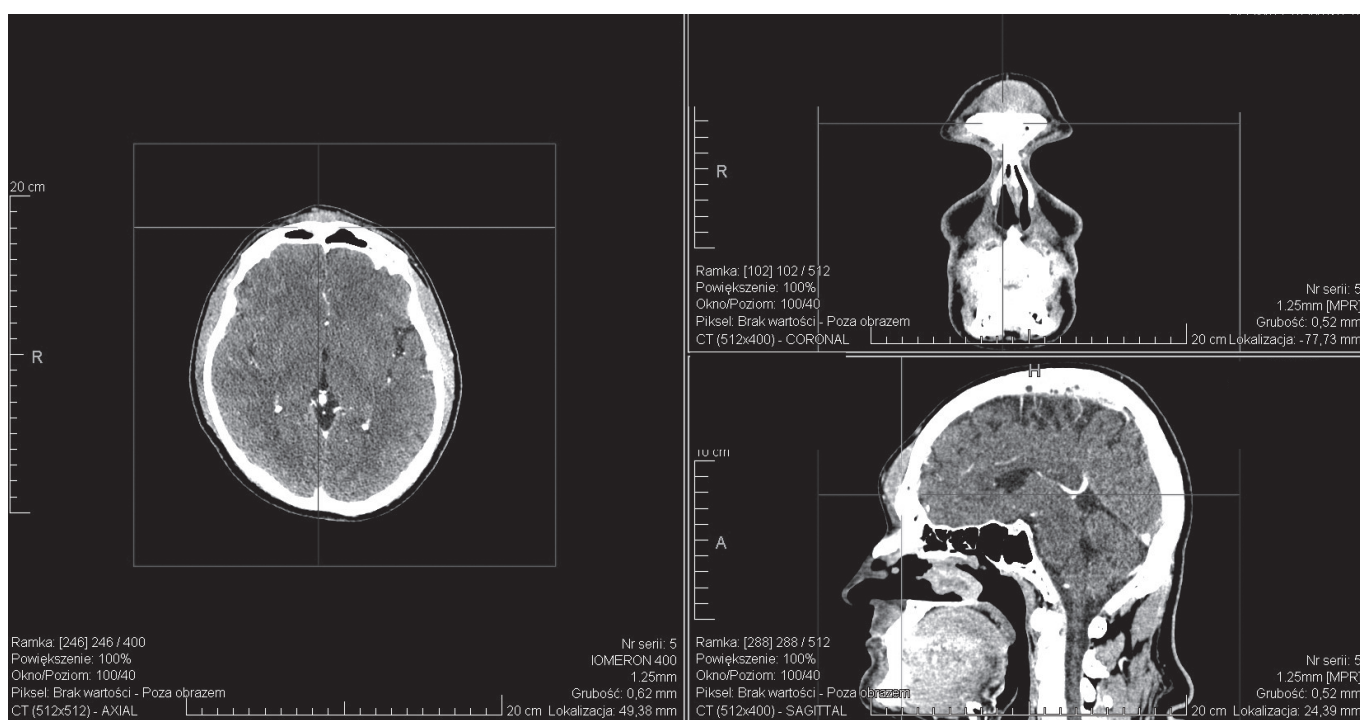


Figure 1. Contrast-enhanced CT of the paranasal sinuses on admission

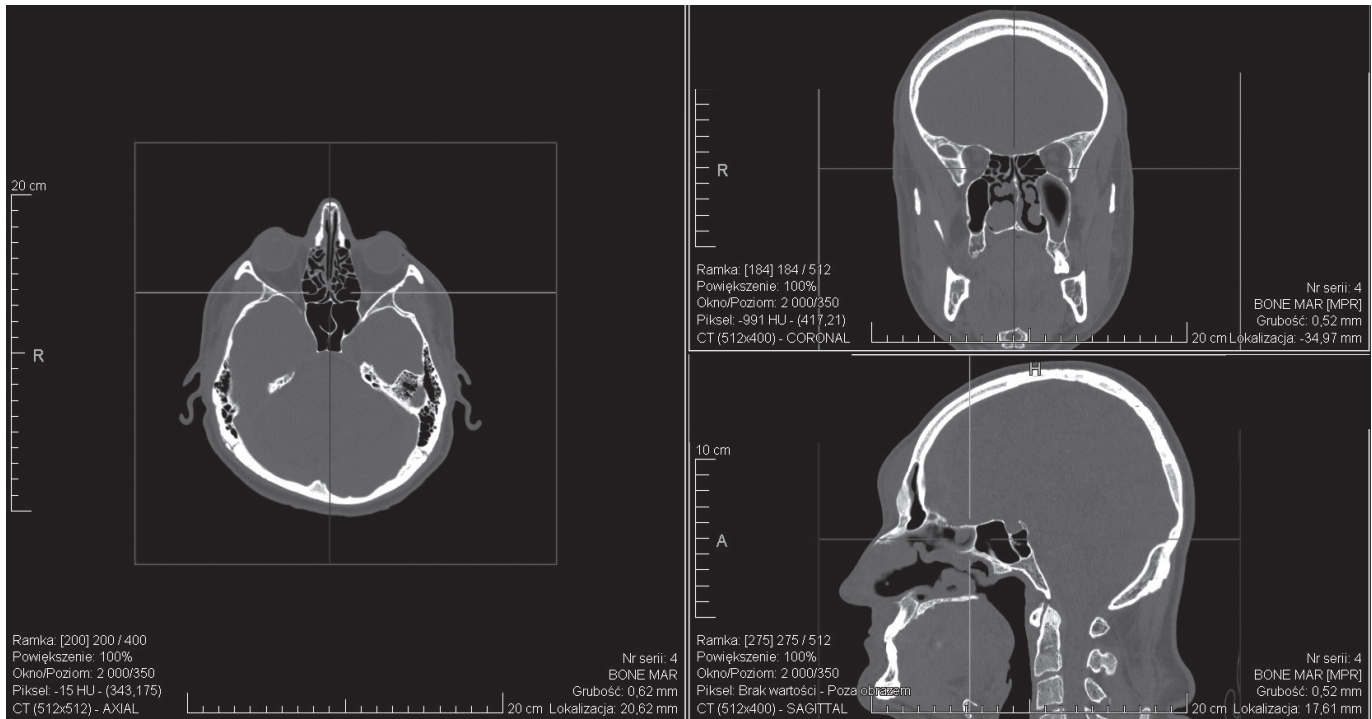


Figure 2. Non-contrast-enhanced CT of the paranasal sinuses on admission

cess within the uninvolved tissues as used to remove the lesion from the frontal region. Specimens were collected from the right inferior nasal concha. Diffuse large B-cell lymphoma was diagnosed based on histopathological examination of the soft tissues of the forehead and the right inferior nasal concha. The patient was referred for further haematological treatment.

Discussion

Pott's puffy tumour is described in the literature as a swelling of the skin and soft tissues of the frontal region or a subperiosteal abscess associated with frontal bone osteomyelitis [1, 2]. The most common causes of this pathology include a complication of acute or chronic frontal sinusitis, trauma to the frontal region, surgical interventions involving the forehead, dental infections, and cocaine abuse [1, 3, 4]. Additionally, patients with a history of allergy to penicillins or cephalosporins, a history of trauma to the frontal region and a low body mass index are more predisposed to Pott's puffy tumour [7].

Frontal oedema, fever, nasal discharge, periorbital swelling and, less commonly, neurological symptoms such as nausea, vomiting, skin fistulas, seizures, and altered mental status are the main symptoms [1, 8]. The disease affects mainly adolescents, but can occur in any age group [1, 2, 9]. The diagnosis is made on the basis of clinical symptoms and imaging findings, i.e., CT or magnetic resonance imaging (MRI) of the head with contrast enhancement.

We emphasise the importance of prompt diagnosis and treatment to avoid neurological complications. Surgical intervention, involving drainage of the frontal sinus from an external or intranasal access, combined with long-term antibiotic therapy based on culture and an-

tibiogram, is the mainstay of treatment [1, 8, 9]. Similar cases to the one in our Department have been described in other reports, where the clinical picture implied Pott's puffy tumour, while the histopathological findings were suggestive of lymphoma [6]. Squamous cell carcinoma (SCC; 39.8%), mature B-cell lymphomas (17.5%), unspecified epithelial neoplasms (10.5%) and adenocarcinomas (ADC; 9.9%) are the most common histological types of frontal sinus tumours [6, 10, 11]. Lymphomas are classified as Hodgkin lymphomas (10% of all cases) and non-Hodgkin lymphomas (NHL; 90%), with DLBCL being the predominant type of NHL in the sinonasal tract [12].

DLBCL of the head and neck area mainly involves the Waldeyer ring (WR). However, involvement of the nasal cavity, paranasal sinuses, periorbital area, thyroid and salivary glands may also occur [5, 12]. The maxillary sinus (36.1%) and the nasal cavity (34.5%) are the most common locations of DLBCL within sinuses. Nasal cavity involvement is more common in the Asian and Pacific Islander populations (43.4%), whereas maxillary sinus involvement is more prevalent in Caucasians (36.3%) and African-Americans (42.1%) [5].

Sinonasal lymphoma may go undiagnosed for months or years and thus lead to treatment delays [6]. Diagnosis of the disease is based on clinical presentation and diagnostic imaging, followed by surgical intervention, involving early collection of pathological tissue specimens for histopathological examination. Systemic symptoms of lymphoma include fever without an apparent source, night sweats, unintended weight loss, non-painful lymphadenopathy and signs of bone marrow invasion, such as leucocytosis, leukopenia, anaemia, and thrombocytopenia [13]. Symptoms associated with the presence of an extra-lymphatic tumour, in this case a tumour located in the paranasal sinuses, include nasal obstruction and

discharge, nasal bleeding, facial oedema or symptoms associated with cranial nerve compression, such as impaired vision or smell. Unfortunately, symptoms are often suggestive of inflammation and upper respiratory tract infections, including sinusitis, which delays correct diagnosis [12, 14, 15].

Kennedy et al. pointed to CT and MRI of the head as the imaging modalities of choice [14]. On T1-weighted MRI, lymphoma shows strong enhancement, as do acute sinus infections. On T2-weighted images, sinonasal lymphomas have a characteristic tendency to show a hyperintense T2 signal and less restricted diffusion, while the same image can be produced by squamous cell carcinoma. CT allows a better assessment of the extent of bone destruction compared to MRI. The ambiguous image of lymphoma on imaging gives rise to additional challenges in accurately identifying the underlying disease [14].

The presence of a suspicious mass requires collecting specimens for histopathological examination in the first place and then, depending on the result, implementing appropriate treatment [16]. The localisation of tumours in the frontal sinuses is generally associated with a very poor prognosis, irrespective of the histopathological result, due to the non-specific symptoms and the location posing a high risk of invading the orbit and anterior cranial fossa. Among frontal sinus tumours, mature B-cell non-Hodgkin lymphoma has the best prognosis, whereas adenocarcinoma has the worst [10, 17]. A higher stage in the modified Ann Arbour classification for staging primary lymphomas is associated with an unfavourable prognosis [5]. Varelas et al. indicate that surgical intervention has no significant impact on survival [5]. Surgery is indicated when the tumour invades critical blood vessels and nerves [15]. Radiochemotherapy, which allows for complete remission in 50% of cases, is the mainstay of treatment, while chemotherapy alone is recommended for patients with disseminated disease with a very poor prognosis [5, 18].

Conclusions

The case described should remind clinicians that malignant lesions may initially produce non-specific symptoms of allergy or upper respiratory tract infection. Therefore, it is worth paying particular attention to the situation when the patient's condition improves only for a short time or does not improve at all despite conservative treatment used. Lymphomas are characterised by a good response to treatment and a high survival rate. Therefore early diagnosis and staging offer the possibility of good treatment outcomes.

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