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Diffuse large B-cell lymphoma (DLBCL) accompanied by a pathologically enlarged pack of lymph nodes: A review

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ABSTRACT

Introduction: Diffuse large B-cell lymphoma (DLBCL) is a relatively common lymphoma with an aggressive course. A complete cure is possible for this type of lymphoma. The etiology of this cancer is unknown, but a number of factors, including environmental factors, contribute to the onset of this disease. *The aim:* The purpose of this article is to present diffuse large B-cell lymphoma as a curable disease if detected and treated early enough. *Case report:* The described case is a 70-year-old patient who came to the doctor with a neck tumor. After taking an interview, taking a history and physical examination, and making a diagnosis, the patient was diagnosed with Diffuse large B-cell lymphoma. *Results:* DLBCL is the most common lymphoma type in adults, characterized by highly aggressive and dynamic development. Diffuse large B-cell lymphoma most often occurs in older people, around 70 years old. The diagnosis of DLBCL is based on histopathological examination of a sample taken during surgery, i.e., the cancerous lymph node. In this type of lymphoma, complete recovery is possible with early diagnosis and treatment. *Conclusions:* Due to the aggressive development of Diffuse large B-cell lymphoma, only rapid diagnosis and treatment can ensure tumor regression. Diagnosis of cancer is based on histopathological examination, while treatment is based on surgery and subsequent postoperative chemotherapy.

Keywords: Neck tumor, lymphoma, DLBCL, diffuse large B-cell lymphoma

1. INTRODUCTION

Diffuse large B-cell lymphoma (DLBCL) is among the most common groups of lymphomas among lymphoid malignancies. The incidence of DLBCL in Europe is about a dozen cases per 100,000 people in the general population per year. The cancer is more likely to occur in what is considered old age (Zelenetz et al., 2010). The etiology of DLBCL formation is unknown. Scientists believe that a genetic predisposition may be necessary. Immunologic, environmental, infectious, or iatrogenic factors, among others, have a proven association with the occurrence of DLBCL. An increased risk of the disease is found in people with primary and secondary immune disorders, AIDS patients are among a particularly vulnerable group of patients.

Viral infections, e.g., Ebstein-Barr virus (EBV), human herpes virus type 8 (HHV-8), human immunodeficiency virus (HIV), and hepatitis C virus (HCV) carry an increased risk of lymphoma. Transplant recipients who are under immunosuppression are at high risk of proliferation of Ebstein-Barr virus-infected polyclonal B lymphocytes and subsequent transformation into DLBCL (Blombery et al., 2015). Mechanisms leading to neoplastic transformation of normal lymphocytes in DLBCL are due to the occurrence of genetic instability with subsequent dysregulation of oncogene expression levels or loss of function of tumor suppressor genes (Lenz and Staudt, 2010). In our work, we will present that timely diagnosis and proper treatment of DLBCL lead to full patient cure (Kawano et al., 2021; Eyre et al., 2022).

2. METHODOLOGY

This case study was conducted by searching for current papers on PubMed and Google Scholar using the search phrases (DLBCL) OR (diffuse large B-cell lymphoma) AND (lymphoma). After eliminating duplicates, we appraised all publications using the titles and abstracts. Following an exact revision of complete manuscripts, 20 articles met the inclusion criteria. The research took place in March 2024.

3. CASE STUDY

A seventy-year-old patient presented to the Department of Otolaryngology at the Frederic Chopin Clinical Regional Hospital Number 1 in Rzeszow on the basis of a referral from a family medicine physician. The initial diagnosis, as determined by the admitting physician, was a neck tumor on the left side and status post-treatment for lymphoma. On otolaryngological examination, the patient's general condition was assessed as good: Normal nasal mucosa and nasal patency on the right, dryness after lymphoma treatment, external auditory canals and eardrums of the right and left ears unchanged, oral cavity unchanged, throat unchanged, larynx on indirect laryngoscopy unchanged, on the neck on the left side in the submandibular region palpation of a soft tumor of about 4 cm in diameter (Figure 1).

A blood count results were E 5.06x10^6/uL, Hb 15.1g/dL, Ht 45.8%, MCV 90.5 fL, Pk 231x10^3/uL, L 5. 67x10^3/uL, NEUT 69.0%, LYMPH 21.3%, MONO 6.9%, EOS 1.9%, BASO 0.9%, IG% 0.02x10^3/uL, NRBC% 0.0%, NRBC# 0.0x10^3/uL, Micro R 1.7%, Macro R 3.9%. On the same day, the patient was qualified for surgery and underwent Exstirpatio Lymphonodulorum colli sin under general anesthesia. During the procedure, a neck skin incision was made on the left side over a packet of group III lymph nodes with a palpable size of 5x3 cm. The surgeons decided to remove the enlarged pathological lymph node, control the bleeding, and apply a seton in the postoperative cavity, sutures, and a dressing. The material was submitted for histopathological verification. The day after the procedure, the patient felt well.

Medical personnel changed her dressing and removed the seton. The wound was healing properly. The patient was discharged home in good condition with recommendations to remove the sutures in 7 days and to use Augmentin 2x1.0. The final clinical diagnosis was locally enlarged lymph nodes. Histopathological examination diagnosed a tumor formed of large atypical lymphocytes, with a diffuse growth type involving adjacent fatty tissue and nerve trunks. IHC profile of tumor cells: CD20+, bcl2+, bcl6+, CD10-, MUM1+, c-myc-(+ <30%), CD5-, CyclinD1-, CD23-. The proliferative activity of Ki-67 is almost 100%. Histopathological picture and IHC profile may correspond to diffuse large B-cell lymphoma: DLBCL NOS, ABC-type. Indication for determination of BCL2, BCL6, and MYC gene rearrangements to exclude double/triple hit lymphoma.

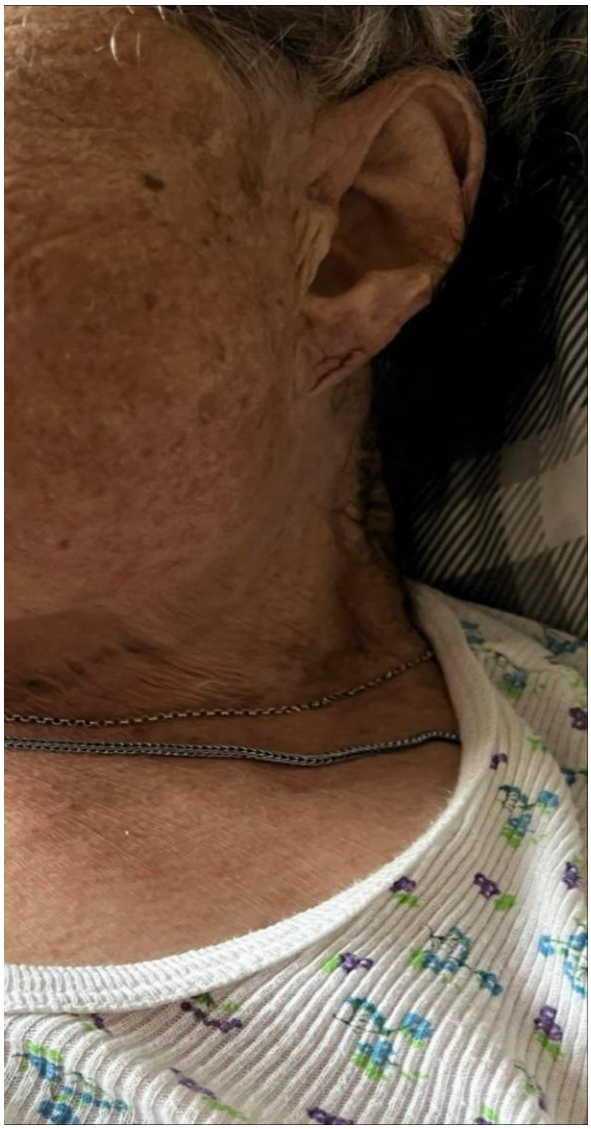

Figure 1 A soft tumor of about 4cm in diameter on the left side of the neck.

4. DISCUSSION

DLBCL is a common type of lymphoma with an aggressive course but with the possibility of a complete cure (Nogai et al., 2011; Yang et al., 2021). It occurs in people of all ages, more commonly in the elderly (Wang, 2023; Kos et al., 2021). Diffuse large B-cell lymphomas (DLBCL, diffuse large B-cell lymphoma) are the most common type of non-Hodgkin's lymphoma in adults and a highly heterogeneous group of diseases in terms of both morphological, biological, and clinical features (Takahara et al., 2023). The basis for diagnosing DLBCL is histopathological examination. The entire lymph node or possibly a fragment of the involved organ should be taken. Histopathologic evaluation needs to be augmented with immunophenotypic studies using monoclonal antibodies (Silkenstedt et al., 2024).

DLBCL lymphoma cells express pan-B antigens (CD19, CD20, CD22, CD79a), with varying percentages of BCL6, BCL2, and CD10, and exceptionally express the CD5 antigen (Chow, 2020; Stachura et al., 2006). In 30-40% of DLBCL cases, there are inappropriate alterations in the BCL6 gene (3q27), which rearrange around gene loci for immunoglobulins in the 14q32, 2p12, or 22q11 region. In 15-30% of patients, t (14; 18) is found, which leads to overexpression of BCL2 (Dargent et al., 2022). The third most common (5-10%) chromosomal aberration is t (8; 14), which runs with increased MYC expression and correlates with extra-nodal localization of DLBCL. In several percent of DLBCL cases, the above abnormalities co-occur. Such lymphomas are characterized by a particularly aggressive

clinical course and usually meet the morphologic criteria of unclassifiable B-cell lymphoma, with traits intermediate between DLBCL and Burkitt's lymphoma (Abrey et al., 2005).

Uncommonly, the diagnosis is supplemented with cytogenetic and molecular studies, which may allow assessment of lymphoid cell clonality or are helpful in identifying characteristic genetic abnormalities for a specific lymphoma subtype (Harkins et al., 2019). Recently, gene expression profiling has become increasingly important to define new molecular subtypes. It is also helpful for confirming the diagnosis of DLBCL that does not meet classic diagnostic criteria (Pasqualucci and Dalla-Favera, 2018). Treatment of a neck tumor depends on the diagnosis of its nature. Histopathological confirmation of either a slice or the entire tumor is necessary. The fate of the patient and the choice of a suitable treatment method depends on the structure and clinical nature of the lesion.

All non-radical surgeries can worsen the prognosis - this applies to tumors but also to congenital lesions. For some inflammatory or traumatic lesions, physicians can use conservative treatment. Surgical treatment often has to be combined with subsequent radiation or chemotherapy. According to statistics, patient survival without therapy for diffuse large B-cell lymphoma is several to several months (Sehn and Salles, 2021). Due to its aggressive nature, if left untreated, it spreads very quickly, mainly through the blood and lymphatic pathways, where it pathologically alters more lymphatic vessels (Messina et al., 2015). An essential step in managing this type of lesion is to exclude its malignancy. This enables the deployment of appropriately selected pharmacological and surgical treatments. (Solimando et al., 2020).

5. CONCLUSIONS

In summary, DLBCL is the most common type of lymphoma in adults characterized by a highly aggressive and dynamic development. The etiology of DLBCL is still not clear. There are quite a few environmental factors that may increase the chance of developing this lymphoma. The diagnosis of DLBCL on histopathological examination of the lymph node collected during surgery. The treatment of choice for this type of tumor is surgery to remove the lesion and subsequent chemotherapy. The patient's health status after treatment depends most on the cancer stage at the time of presentation to the doctor.

Author's Contribution

Anna Józefiak: Conceptualization, methodology, investigation
Magdalena Szczepanik: Conceptualization, methodology, investigation
Cezary Bochyński: Methodology, Review and editing
Przemysław Hałasiński: Conceptualization, writing- rough preparation
Dominika Kropidłowska: Resources, writing- rough preparation
Maciej Horbaczewski: Conceptualization, writing- rough preparation
Kinga Piela: Formal analysis, supervision
Jolanta Mazurek: Review and editing, supervision
Gabriela Mazurek- Visualization, data curation
Maria Myślicka: Formal analysis, supervision
Patryk Góralski: Resources, writing- rough preparation
Klaudia Włodarczyk: Visualization, data curation
Project administration: Cezary Bochyński

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Data and materials availability
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