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COEXISTING WALDENSTRÖM MACROGLOBULINAEMIA AND ALVEOLAR ECHINOCOCCOSIS PRESENTING WITH CHYLOTHORAX THAT RESOLVED ON TREATMENT: A DIAGNOSTIC AND THERAPEUTIC CHALLENGE

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ABSTRACT

Introduction: Waldenström macroglobulinaemia is a lymphoplasmacytic lymphoma producing monoclonal immunoglobulin M (IgM), and both the disease and its treatment can cause immunosuppression. Alveolar echinococcosis is a parasitic infection that primarily involves the liver but may present with extrahepatic manifestations.

Case description: We report the case of a patient who presented with chylothorax and non-specific hepatic lesions and was then diagnosed with Waldenström macroglobulinaemia. In addition to this diagnosis, alveolar echinococcosis was subsequently confirmed by liver biopsy and serology.

Discussion: Diagnostic interpretation was challenging, as these features may occur in both conditions. A multidisciplinary approach was needed to establish the treatment plan due to overlapping symptomatology and the risk of treatment-related immunosuppression.

Conclusion: This case highlights the importance of considering a broad differential diagnosis for a chylothorax and hepatic lesions in an oncological context and illustrates the therapeutic challenges of managing an indolent haematologic malignancy in the context of a chronic parasitic infection.

KEYWORDS

Waldenström macroglobulinaemia, chylothorax, alveolar echinococcosis, zanubrutinib

LEARNING POINTS

- Chylothorax has a large differential diagnosis and is often difficult to treat.
- Echinococcosis can clinically and radiologically mimic malignancy.
- The investigation and management of a patient with both conditions are challenging.

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INTRODUCTION

Waldenström macroglobulinaemia and alveolar echinococcosis are two rare diseases that can present with a wide range of symptoms. Waldenström macroglobulinaemia is a lymphoplasmacytic lymphoma characterised by the production of a monoclonal immunoglobulin M (IgM) protein. The age-adjusted incidence rate is approximately 0.42 per 100,000 person-years, accounting for 1–2% of all haematologic malignancies[1]. Between 19 and 28% of patients are asymptomatic at diagnosis. When symptoms occur, they may be non-specific (fatigue, weight loss, fever) or related to lymphadenopathy, hepatomegaly or hyperviscosity syndrome. The diagnostic workup includes serum immunoglobulin levels, serum protein electrophoresis with immunofixation and bone marrow biopsy with cytogenetic studies (e.g. MYD88 and CXCR4 mutation analysis)[1]. Treatment is typically initiated in symptomatic cases, most commonly with chemotherapy and immunotherapy.

Alveolar echinococcosis (AE) is a chronic parasitic infection caused by accidental ingestion of *Echinococcus multilocularis* eggs, typically transmitted by definitive hosts such as foxes, dogs or cats. It is named after its histopathological feature of multiple small vesicles arranged in a multilocular pattern, giving it an alveoli-like appearance. It primarily affects the liver and behaves similarly to a malignant tumour, with potential to metastasise to other organs such as the lungs or brain. Switzerland is a highly endemic country with an estimated annual incidence in 2021 ranging from 0.58 to 1.33 per 100,000 inhabitants[2]. Diagnosis relies on imaging methods, serological testing and in some cases, liver biopsy. Treatment typically involves curative surgery when feasible, or lifelong albendazole in inoperable cases.

Chylothorax is a rare cause of pleural effusion, characterised by the accumulation of chyle in the pleural space. The aetiology of chylothorax can be either traumatic, often due to iatrogenic injury, or non-traumatic. It typically results from conditions obstructing the thoracic duct, such as malignancies or infections with associated mediastinal lymphadenopathy or direct invasion of the thoracic duct by malignant cells[3].

We describe a rare case of a 64-year-old patient presenting in the emergency department with left-sided chylothorax and hepatic lesions, who was diagnosed with both a Waldenström lymphoma and AE. This case highlights the overlapping clinical features, making it both a diagnostic and therapeutic challenge.

CASE DESCRIPTION

This case relates to a male patient in his 60s with a history of epilepsy treated with lamotrigine. He is a farmer who lives at the edge of a forest, and he regularly consumes small wild fruits.

He presented to our emergency room at the end of 2024 with a progressive exertional dyspnoea for four weeks and a dry cough. He also reported intermittent abdominal pain in the epigastrium and right hypochondrium, and some non-specific night sweats. His body weight was stable, and he had no jaundice. An initial contrast-enhanced thoracic CT scan revealed a large left pleural effusion, two hepatic lesions and a cystic lesion in the spleen. The hepatic lesions were described as hypodense lesions with irregular borders with no significant enhancement after contrast administration. Thoracentesis confirmed chylothorax with elevated triglycerides (5.67 mmol/l) and lymphocytosis, with no malignant cells detected. A subsequent thoraco-abdominal CT scan showed axillary lymphadenopathy and a necrotic mediastinal lymph node *(Fig. 1)*.

Laboratory investigations revealed a haemoglobin level of 105 g/l, leukocytes of 3.4 $\times 10^9$/l, eosinophils at 0.0% and a C-reactive protein of 18.7 mg/l. Liver enzymes were within the normal range. Serum immunology showed elevated IgM (25.45 g/l) and lambda free light chains, with normal IgG levels and increased beta-2 microglobulin. Serum protein electrophoresis demonstrated a pathological beta-2 fraction with a positive immunofixation; peripheral blood smear was suggestive of a B-cell lymphoproliferative disorder.

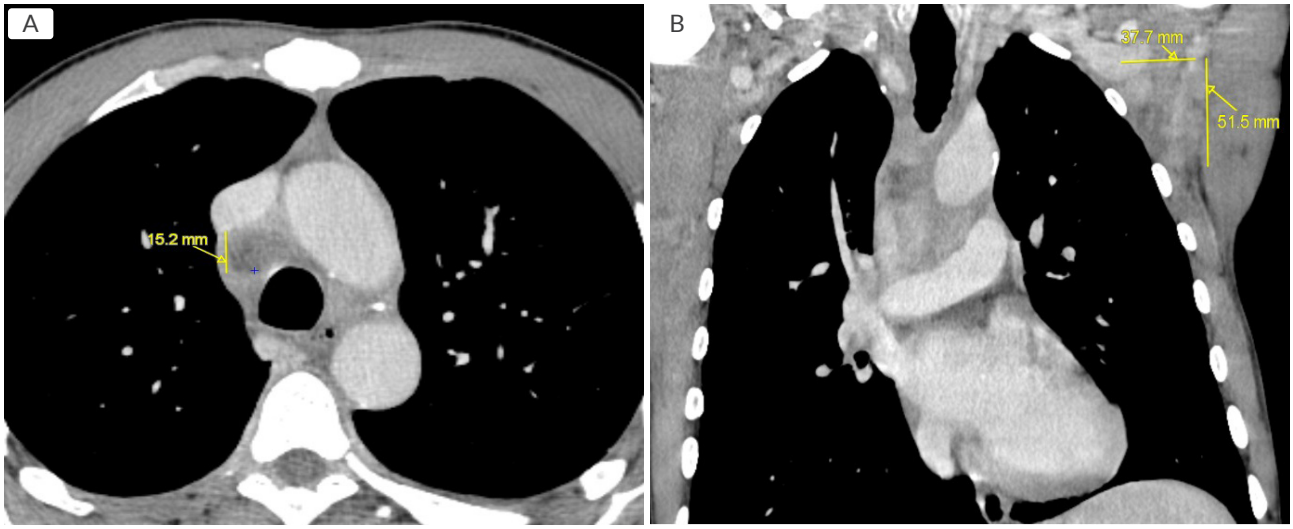


Figure 1. A) Thoracic CT scan showing mediastinal and B) axillary lymphadenopathy.

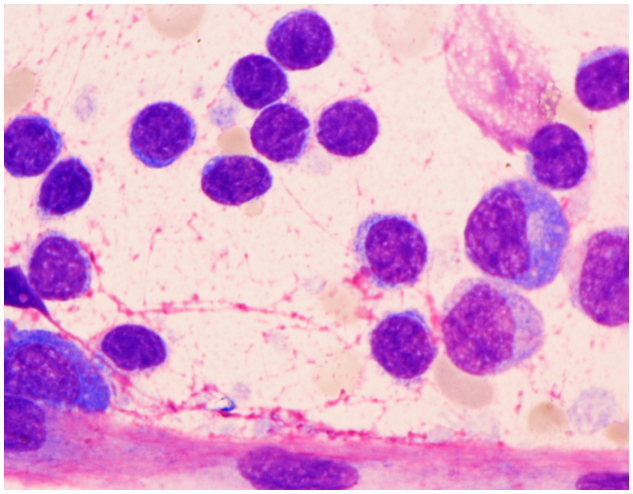


Figure 2. Bone marrow biopsy shows small lymphocytes with scant cytoplasm, some exhibiting eccentric nuclei, suggestive of lymphoplasmacytic differentiation.

A bone marrow biopsy confirmed Waldenström macroglobulinaemia, demonstrating infiltration by a small B-cell lymphoma that was CD5-negative, with partial cellular differentiation expressing IgM lambda at 60% *(Fig. 2)*. Molecular analysis revealed the presence of MYD88 mutation and negative CXCR4. Cytogenetic analysis showed hyperdiploidy with up to 48 chromosomes, some exhibiting loss of the long arm of chromosome 6. An axillary lymph node biopsy revealed a monomorphic proliferation of small lymphocytes consistent with a low-grade B-cell lymphoma *(Fig. 3)*. A complete viral serology and tuberculosis spot test were performed to exclude an infectious cause of lymphadenopathy.

Regarding the two hepatic lesions (segment IVA: 3.3 cm, segment VI: 3.2 cm), additional MRI demonstrated lobulated hepatic lesions with subtle peripheral enhancement, mild diffusion hyperintensity without restriction and no delayed-phase filling *(Fig. 4)*.

Laboratory tests showed elevated lactate dehydrogenase at 299 U/l (125–220) and a significantly increased carbohydrate antigen (CA) 19–9 at 648 U/ml (<37). Due to oncological concerns, a liver biopsy under ultrasound guidance was performed. Histopathology revealed necrotic tissue with periodic acid-Schiff (PAS)-positive membrane structures suggestive of AE *(Fig. 5)*. Parasitic serologies with enzyme-linked immunosorbent assay (ELISA) showed EgHG at 81, Em^2 < 1 and Em at 4 (<1.0 AE). A western blot confirmed positivity for both *Echinococcus multilocularis* and *Echinococcus granulosus*.

The patient was monitored for recurrence of the chylothorax and underwent multiple therapeutic pleural drainages. The interdisciplinary liver tumour board at the University Hospital in Bern recommended a conservative (non-surgical) management strategy with lifelong albendazole therapy, due to the small size of the lesions and the higher priority of treating the lymphoma. The therapeutic approach was continued due to the good tolerance of albendazole. Follow-up was arranged in the hepatology department, including regular monitoring of liver function and repeat MRI imaging at six months.

In parallel, treatment for the lymphoplasmacytic lymphoma was initiated by the haematologist using a second-generation Bruton's tyrosine kinase inhibitor, zanubrutinib. The patient showed a favourable clinical response within a few weeks, notably with resolution of the recurrent chylothorax.

DISCUSSION

This case report describes two rare and slowly progressive concomitant diseases with overlapping clinical features. The patient initially presented with lymphadenopathy, chylothorax and two non-specific hepatic lesions. The diagnosis of Waldenström macroglobulinaemia was established through blood analysis, bone marrow biopsy and genetic testing.

It was decided to biopsy the liver lesion due to non-characteristic imaging findings (CT, US and MRI) and the patient's haemato-oncological background. Although AE typically presents with distinctive radiological features, it is often misdiagnosed as a malignant hepatic lesion[4]. Histopathological analysis of the hepatic lesion was compatible with AE. However, the final diagnosis was challenging due to positive ELISA serology for *Echinococcus granulosus*. Western blot testing was positive for both *E. granulosus* and *E. multilocularis*. The positive antibodies against *E. granulosus* were interpreted as cross-reactivity in the context of an AE infection. In addition, tumour markers were assessed, revealing an elevated CA 19-9 level (648

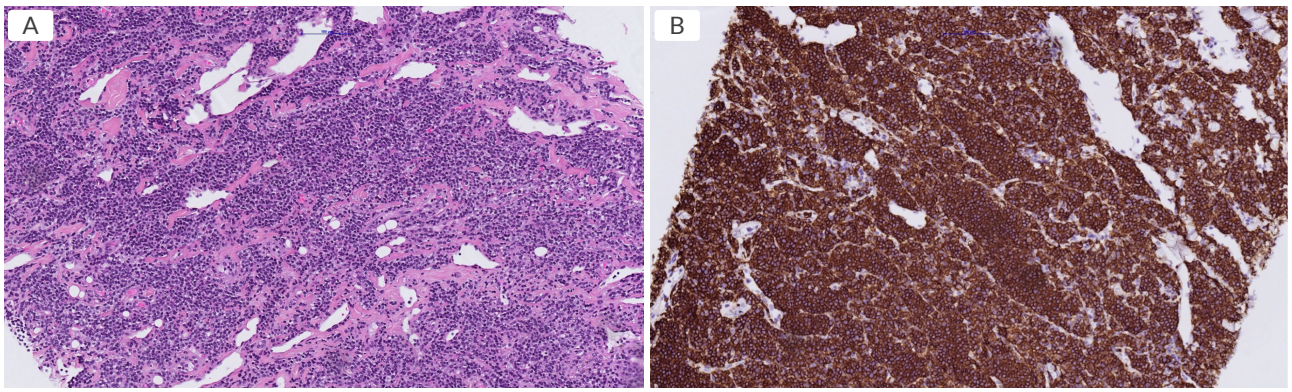


Figure 3. Lymph node biopsy A) H&E staining and B) CD20 immunohistochemistry confirming B-cell lymphoma.

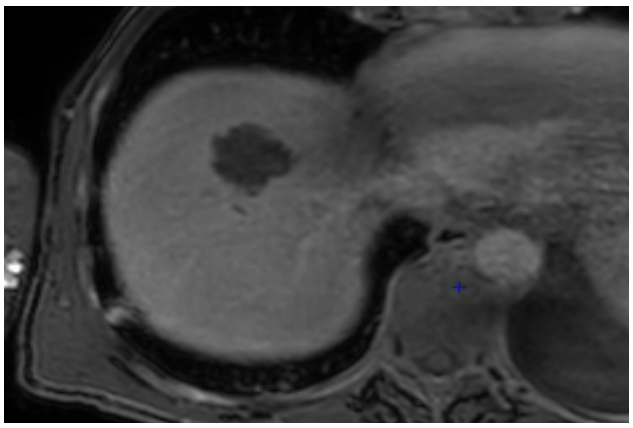


Figure 4. Contrast-enhanced abdominal MRI demonstrates a 3.2 cm lesion in hepatic segment VI.

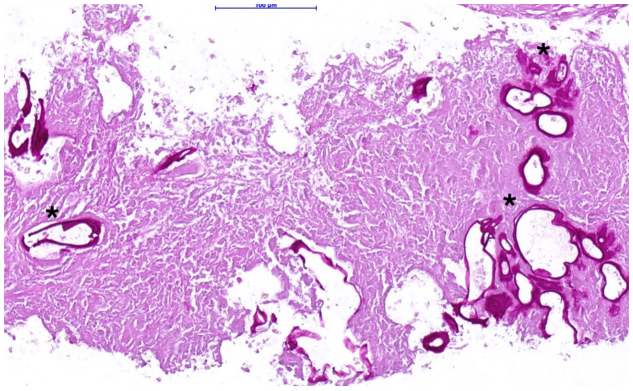


Figure 5. Liver biopsy, PAS-positive membranous structures (asterisk) in the necrotic tissue/debris.

U/ml), which raised suspicion for an oncological lesion. In a previous study, it was demonstrated that 45% of patients with an AE infection had an increase in CA 19-9 levels[5].

Multiple cases of chylothorax caused by Waldenström macroglobulinaemia have been described in the literature, most likely resulting from obstruction of the thoracic duct due to retroperitoneal lymphadenopathy or lymphoreticular infiltration of the thoracic duct. One case documented complete resolution of the chylothorax with ibrutinib therapy, and another described the use of pleurectomy due to refractory pleural effusion. Chylothorax due to echinococcosis has also been documented in a few cases, particularly when there is extrahepatic involvement, as seen in AE. An extended review of the literature is provided in the supplementary material.

In this case, the chylothorax was most likely caused by Waldenström macroglobulinaemia, with lymphadenopathy compressing and rupturing the thoracic duct, resulting in the chylothorax. This aetiology was supported by the marked reduction in the effusion after four weeks of lymphoma treatment with zanubrutinib. In addition, no extrahepatic manifestations of echinococcosis were observed, as confirmed by a PET scan performed in 2025, and the patient was treated with albendazole prior to the lymphoma treatment without any improvement in the chylothorax. Therefore, echinococcal infection was considered a less likely cause of the chylothorax.

The choice of treatment for the lymphoplasmacytic lymphoma was challenging due to the concomitant parasitic infection and risk of immunosuppression, which could potentially lead to a progression of the parasitic disease despite ongoing lifelong albendazole therapy. The latest guidelines from The National Comprehensive Cancer Network suggest a first line of immunochemotherapy with bendamustine and rituximab, and a second line with a Bruton's tyrosine kinase inhibitor for symptomatic Waldenström macroglobulinaemia[6]. Treatment is also guided by cytogenetic findings; in this case, the patient is positive for the MYD88 mutation and negative for the CXCR4 mutation, which are associated with a good prognosis and response to treatment[7]. In this context, it was decided to treat the lymphoma with the second line therapy using zanubrutinib, which is associated with less chemotherapy-related myelosuppression[8]. Immunosuppressed patients have a higher incidence of AE and a faster disease progression if untreated, underlining the importance of minimising diagnostic delay[9]. In this context, the patient may have already been immunosuppressed secondary to Waldenström macroglobulinaemia. Although his IgG levels were normal, his cellular immunity was not assessed. This may have contributed to the rapid development of symptomatic echinococcal infection, which primarily presented with right upper quadrant pain.

CONCLUSION

To conclude, this case highlights the importance of broadening the differential diagnosis when encountering non-specific findings such as chylothorax or hepatic lesions, even in the context of a confirmed haematologic malignancy. AE should always be considered in the differential diagnosis of hepatic lesions in endemic areas, particularly when imaging findings are non-specific and suggest malignancy. Treatment of Waldenström macroglobulinaemia is indicated in symptomatic disease, and the choice of therapy should be guided by the patient's comorbidities and overall clinical context. Therefore, identifying the underlying aetiology of the chylothorax and hepatic lesions was crucial in guiding optimal multidisciplinary treatment.

REFERENCES

1. Gertz MA. Waldenström macroglobulinemia: 2023 update on diagnosis, risk stratification, and management. *Am J Hematol* 2023;**98**:348–358. doi:10.1002/ajh.26796
2. Ollagnon M, Bresson-Hadni S, Spahr L, Rubbia-Brandt L, Toso C, Chappuis F. Alveolar echinococcosis in the canton of Geneva between 2010 and 2021: a descriptive analysis. *Swiss Med Wkly* 2025;**155**:3863. doi:10.57187/s.3863
3. Bhatnagar M, Fisher A, Ramsaroop S, Carter A, Pippard B. Chylothorax: pathophysiology, diagnosis, and management – a comprehensive review. *J Thorac Dis* 2024;**16**:1645–1661. doi:10.21037/jtd-23-1636
4. Baudinov I, Kadyrova A, Ibraimov K, Prabha KC, Bebezov B, Aitbaev S, et al. Diagnostic imaging modalities in the study of hepatic alveolar echinococcosis: a review of literature. *Cardiovasc Dis* 2025;**9**: doi: 10.24969/hvt.2025.558
5. Pfister M, Gottstein B, Kretschmer R, Cerny T, Cerny A. Elevated carbohydrate antigen 19-9 (CA 19-9) in patients with Echinococcus infection. *Clin Chem Lab Med* 2001;**39**:527–530. doi:10.1515/CCLM.2001.088
6. Kumar SK, Callander NS, Adekola K, Anderson LD Jr, Baljevic M, Baz R, et al. Waldenström macroglobulinemia/lymphoplasmacytic lymphoma, version 2.2024, NCCN Clinical Practice Guidelines in Oncology. *J Natl Compr Canc Netw* 2024;**22**:e240001. doi:10.6004/jnccn.2024.0001
7. Kaiser LM, Hunter ZR, Treon SP, Buske C. CXCR4 in Waldenström's macroglobulinemia: chances and challenges. *Leukemia* 2021;**35**:333–345. doi:10.1038/s41375-020-01102-3
8. Castillo JJ, Yang K, Liu R, Wang Y, Cohen A, Zimmerman TM, et al. Efficacy and safety of zanubrutinib versus rituximab-based chemoimmunotherapy in Waldenström macroglobulinemia (WM): Matching-adjusted indirect comparisons: hematologic malignancies – lymphoma and chronic lymphocytic leukemia. *J Clin Oncol* 2021;**39**:7559. doi: 10.1200/JCO.2021.39.15_suppl.7559
9. Chauchet A, Grenouillet F, Knapp J, Richou C, Delabrousse E, Dentan C, et al. FrancEchino Network. Increased incidence and characteristics of alveolar echinococcosis in patients with immunosuppression-associated conditions. *Clin Infect Dis* 2014;**59**:1095–1104. doi:10.1093/cid/ciu520.

SUPPLEMENTARY MATERIAL

An extended literature search was performed with the keywords "chylothorax," "Waldenström macroglobulinemia," and "alveolar echinococcosis."

Case 1. Chylothorax as a complication of Waldenström macroglobulinemia caused by obstruction of the thoracic duct.

Reference: Gary P, Gianniosis M, Ryu J, Flynn S. Chylothorax as a complication of Waldenström macroglobulinemia with a patient's perspective. *BMJ Case Rep* 2021;**14**:e241707. doi: 10.1136/bcr-2021-241707.

Case 2. Chylothorax as the initial manifestation of Waldenström macroglobulinemia due to tumor infiltration.

Reference: Rodriguez Botero N, Zerrate Misas A, Galvez Cardenas KM, Ramirez Quintero JD. Chylothorax as an initial manifestation of Waldenström macroglobulinemia. *Cureus* 2020;**12**:e7566. doi: 10.7759/cureus.7566.

Case 3. Successful resolution of chylothorax with monoclonal antibody therapy.

Reference: Otoupalova E, Meka SG, Dogra S, Dalal B. Recurrent chylothorax: a clinical mystery. *BMJ Case Rep* 2017;**2017**:bcr2017220750. Doi :10.1136/bcr-2017-220750.

Case 4. Use of pleurectomy for refractory pleural effusions in a patient with Waldenström macroglobulinemia.

Reference: Mullen ND, Bukhari A, Koroscil M. Refractory chylothorax in a patient with Waldenström macroglobulinemia: a case report. *Respir Med Case Rep* 2022;**40**:101780. doi: 10.1016/j.rmcr.2022.101780.

Case 5. Chylothorax due to extrahepatic manifestation of alveolar echinococcosis.

Reference: Schneider A, Klengel S, Lübbert C, Trawinski H. Chylothorax due to hepatic alveolar echinococcosis with infiltration of the diaphragm and left pleura: a case report. *BMC Infect Dis* 2023;**23**:229. doi: 10.1186/s12879-023-08180-5.