Bing Neel syndrome

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Bing Neel syndrome is a rare disease manifestation of Waldenstrom macroglobulinemia that results from infiltration of the central nervous system by malignant lymphoplasmacytic cells [1)].

This infiltration increases blood viscosity, which impairs blood circulation through small blood vessels of the brain and the eye. Some scientists proposed that a person diagnosed with BNS is typically classified into Group A and Group B depending on whether or not plasma cells are present within the brain parenchyma, leptomeninges, dura, and/or the cerebrospinal fluid (CSF).

Epidemiology

Bing–Neel syndrome (BNS) is an extremely rare neurologic complication of WM.

Clinical features

The presentation of Bing Neel syndrome may be very diverse, and includes headaches, cognitive deficits, paresis, and psychiatric symptoms. The syndrome can present in patients with known Waldenström's macroglobulinemia, even in the absence of systemic progression, but also in previously undiagnosed patients [2)].

Diagnosis

The diagnostic approach should be based on cerebrospinal fluid analysis and brain magnetic resonance imaging and Spinal magnetic resonance imaging [3)].

Cerebral spinal fluid analysis with multiparameter flow cytometry to establish B cell clonality, serum protein electrophoresis and immunofixation for the detection and classification of a monoclonal protein as well as molecular diagnostic testing for immunoglobulin gene rearrangement and mutated MYD88 [4)].

Treatment

It still remains difficult to establish treatment recommendations or prognostic factors in the absence of large-scale, prospective, observational studies [5)].

Prospective clinical trials on Bing Neel syndrome patients that employ uniform treatment along with appropriate laboratory cerebral spinal fluid assessments and standardized MRI protocols will be invaluable, constituting a significant step forward in delineating treatment outcome for this intriguing disease manifestation [6)].

Case series

2015

Simon et al. retrospectively analyzed 44 French patients with Bing-Neel syndrome. Bing-Neel syndrome was the first manifestation of Waldenström macroglobulinemia in 36% of patients. When Waldenström macroglobulinemia was diagnosed prior to Bing-Neel syndrome, the median time interval between this diagnosis and the onset of Bing-Neel syndrome was 8.9 years. This study highlights the possibility of the occurrence of Bing-Neel syndrome without any other evidence of progression of Waldenström macroglobulinemia. The clinical presentation was heterogeneous without any specific signs or symptoms. Biologically, the median lymphocyte count in the cerebrospinal fluid was 31/mm(3). Magnetic resonance imaging revealed abnormalities in 78% of the cases. The overall response rate after first-line treatment was 70%, and the overall survival rate after the diagnosis of Bing-Neel syndrome was 71% at 5 years. Altogether, these results suggest that Bing-Neel syndrome should be considered in the context of any unexplained neurological symptoms associated with Waldenström macroglobulinemia. The diagnostic approach should be based on cerebrospinal fluid analysis and magnetic resonance imaging of the brain and spinal axis. It still remains difficult to establish treatment recommendations or prognostic factors in the absence of large-scale, prospective, observational studies [7)].

Case reports

2017

A 68-year-old male with right eye vision loss secondary to a compressive optic neuropathy from Waldenstrom macroglobulinaemia relapse in both cavernous sinuses. Central nervous system involvement is extremely uncommon in lymphoplasmacytic lymphoma. Known as Bing-Neel syndrome, this has not been previously reported to present simultaneously in bilateral cavernous sinuses. We discuss the pathophysiology, diagnostic and neuroradiological features of Bing-Neel syndrome. In this case, there was marked clinical and radiological response to chemotherapy. As outcomes following treatment for Waldenstrom macroglobulinaemia improve, greater awareness of its less common manifestations becomes important. Neurosurgical intervention may be indicated to obtain histological diagnosis or decompress critical structures [8)].

Waldenstrom macroglobulinemia presenting as a bilateral subdural chronic hematoma [9)].

2016

Intracranial venous sinus thrombosis as unusual presentation of Bing-Neel syndrome: case illustration [10)].

2014

A case of Bing-Neel syndrome presenting as spinal cord compression [11].

2013

Tumoral Bing-Neel Syndrome presenting as a cerebellar mass [12].

2002

A 72-year-old man with Waldenstrom's macroglobulinemia and central nervous system infiltration by malignant cells with tumor formation [13].

1995

A 68-year-old female presented with Waldenstrom's macroglobulinemia with infiltration into the cerebral parenchyma manifesting as increased confusion, memory loss, and disorientation. She had a past history of Waldenstrom's macroglobulinemia treated 3 years before. Magnetic resonance imaging showed a high intensity area on T2-weighted images in the left frontal lobe extending to the corpus callosum which was well enhanced by gadolinium-diethylenetriaminepenta-acetic acid. Direct infiltration of neoplastic cells was confirmed by biopsy. Immunohistochemical examination showed that mature plasmacytoid cells in the cerebral parenchyma were immunoglobulin M and lambda light chain antigen positive, but immature lymphocytes in Virchow-Robin space were negative. Monoclonal proliferation was confirmed by southern blot analysis. She became symptom free and the size of the lesion was dramatically reduced after 40 Gy irradiation. She showed no evidence of recurrence 3 years after irradiation. As no effective chemotherapy regimen for Bing-Neel syndrome has been established, irradiation is worth considering when neuroimaging suggests intracranial infiltration of neoplastic cells [14].

References

[1], [2], [4], [6]
Minnema MC, Kimby E, D'Sa S, Fornecker LM, Poulain S, Snijders TJ, Kastritis E, Kremer S, Fitsiori A, Simon L, Davi F, Lunn M, Castillo JJ, Patterson CJ, Le Garff-Tavernier M, Costopoulos M, Leblond V, Kersten MJ, Dimopoulos MA, Treon SP. Guideline for the diagnosis, treatment and response criteria for Bing-Neel syndrome. Haematologica. 2017 Jan;102(1):43-51. doi: 10.3324/haematol.2016.147728. Epub 2016 Oct 6. PubMed PMID: 27758817; PubMed Central PMCID: PMC5210231.

[3], [5], [7]
Simon L, Fitsiori A, Lemal R, Dupuis J, Carpentier B, Boudin L, Corby A, Aurran-Schleinitz T, Gastaud L, Talbot A, Leprêtre S, Mahe B, Payet C, Soussain C, Bonnet C, Vincent L, Lissandre S, Herbrecht R, Kremer S, Leblond V, Fornecker LM. Bing-Neel syndrome, a rare complication of Waldenström macroglobulinemia: analysis of 44 cases and review of the literature. A study on behalf of the French Innovative Leukemia Organization (FILO). Haematologica. 2015 Dec;100(12):1587-94. doi: 10.3324/haematol.2015.133744. Epub 2015 Sep 18. Review. PubMed PMID: 26385211; PubMed Central PMCID: PMC4666335.

[8] , [12]
Pham C, Griffiths JD, Kam A, Hunn MK. Bing-Neel syndrome - Bilateral cavernous sinus lymphoma causing visual failure. J Clin Neurosci. 2017 Jul 29. pii: S0967-5868(16)31423-0. doi: 10.1016/j.jocn.2017.07.010. [Epub ahead of print] PubMed PMID: 28765059.
[9]
Franzini A, Gribaudi G, Pirola E, Pluderi M, Goldaniga MC, Marfia G, Rampini PM. Waldenstrom macroglobulinemia presenting as a bilateral subdural chronic hematoma. J Clin Neurosci. 2017 Jun;40:89-91. doi: 10.1016/j.jocn.2017.02.032. Epub 2017 Mar 2. PubMed PMID: 28262409.
[10]
Morabito R, Grasso G, Barresi V, La Spina P, Garufi G, Alafaci E, Salpietro FM, Longo M, Granata F, Alafaci C. Intracranial venous sinus thrombosis as unusual presentation of Bing-Neel syndrome: case illustration. J Neurosurg. 2016 Dec 2:1-2. doi: 10.3171/2016.9.JNS161678. [Epub ahead of print] PubMed PMID: 27911232.
[11]
Rigamonti A, Lauria G, Melzi P, Mantero V, Vismara D, Rossi G, Tetto A, Salmaggi A. A case of Bing-Neel syndrome presenting as spinal cord compression. J Neurol Sci. 2014 Nov 15;346(1-2):345-7. doi: 10.1016/j.jns.2014.08.029. Epub 2014 Aug 28. PubMed PMID: 25201716.
[13]
Delgado J, Canales MA, Garcia B, Alvarez-Ferreira J, Garcia-Grande A, Hernandez-Navarro F. Radiation therapy and combination of cladribine, cyclophosphamide, and prednisone as treatment of Bing-Neel syndrome: Case report and review of the literature. Am J Hematol. 2002 Feb;69(2):127-31. Review. PubMed PMID: 11835349.
[14]
Imai F, Fujisawa K, Kiya N, Ninomiya T, Ogura Y, Mizoguchi Y, Sano H, Kanno T. Intracerebral infiltration by monoclonal plasmacytoid cells in Waldenstrom's macroglobulinemia–case report. Neurol Med Chir (Tokyo). 1995 Aug;35(8):575-9. PubMed PMID: 7566387.