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Case Report

A Bing-Neel syndrome case

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Abstract: Bing-Neel syndrome (BNS) is an extremely rare neurologic complication of WM. Herein, we aimed to report a BNS case. A 57 years old women admitted to hospital with fever, weight loss and cough in November 2009. Complete blood count was resulted as hemoglobin 7.4 gr/dl, white blood cell 1.8 × 10^3/µl, thrombocyte 216 × 10^3/µl. Kidney and liver function tests were in normal range. Anemia parameters were compatible with chronic disease anemia. In serum protein electrophoresis monoclonal IgM kappa pike was observed. Abdominal computerized tomography (CT) revealed splenomegaly. Bone marrow investigation was resulted as, CD20+B cell lymphoproliferative disease. Therefore she was diagnosed as WM and R-CHOP chemotherapy regimen was started. A total of 8 R-CHOP treatment was given and the patient's disease was kept under control. In April 2015, weakness in patient's right hand has begun. Then she admitted to hospital. Neurological examination revealed weakness in right extremities, right hemi-hypoesthesia, dissymmetry, dysdiadokinesia. Cranial CT has revealed focal hypo density that lye from left thalamus inferior to internal capsule. Cranial magnetic resonance images of the patient were reported as, secondary leukemic infiltration of WM. She was diagnosed as BNS. BNS is characterized with central nervous system involvement by neoplastic lymphoplasmacytoid and plasma cells. To conclude, in a WM patient if neurological symptoms appear, the possibility of BNS should be kept in mind.

Keywords: Bing-Neel syndrome, cranial involvement

Introduction

In the clinical follow-up of Waldenstrom Macroglobinemia (WM) cases various symptoms may develop associated with the infiltration of hematopoietic system such as anemia, hepatosplenomegaly or lymphadenopathies. Patients may present with recurrent infections, weight loss, fatigue and weakness. Some neurological manifestations may also occur in WM because of circulation IgM protein such as hyper viscosity symptoms or peripheral neuropathy [1, 2]. However leukemic infiltration due to WM is not usually encountered. Bing-Neel syndrome (BNS) is an extremely rare neurologic complication of WM. Herein, we aimed to report a Bing-Neel syndrome case.

Case report

A 57 years old women applied to hospital with fever, weight loss and cough in November 2009. In her anamnesis she had a history of asthma for 8 years. In physical examination respiratory sound was found rough in bilateral lungs. Laboratory examinations revealed bicytopenia so, she was decided to hospitalize in order to investigate the reason. Complete blood count was resulted as hemoglobin 7.4 gr/dl, white blood cell 1.8 × 10^3/µl, thrombocyte 216 × 10^3/µl. Kidney and liver function tests were in normal range. Anemia parameters were compatible with chronic disease anemia. In serum protein electrophoresis monoclonal IgM kappa pike was observed. Abdominal computerized tomography (CT) revealed splenomegaly. Bone marrow investigation was resulted as, CD20+B cell lymphoproliferative disease. Therefore she was diagnosed as WM and R-CHOP chemotherapy regimen was started. A total of 8 R-CHOP treatment was given and the patient's disease was taken under control. After then she was started to be followed-up periodically. Also, intravenous immunoglobulin treatment was given for prophylaxis. No radiotherapy was performed. In April 2015, weakness in patient's right hand has begun. Then she applied to hospital. Neurological examination revealed weakness in right extremities, right hemi-hypoesthesia, dissymmetry, dysdiadokinesia. Cranial CT

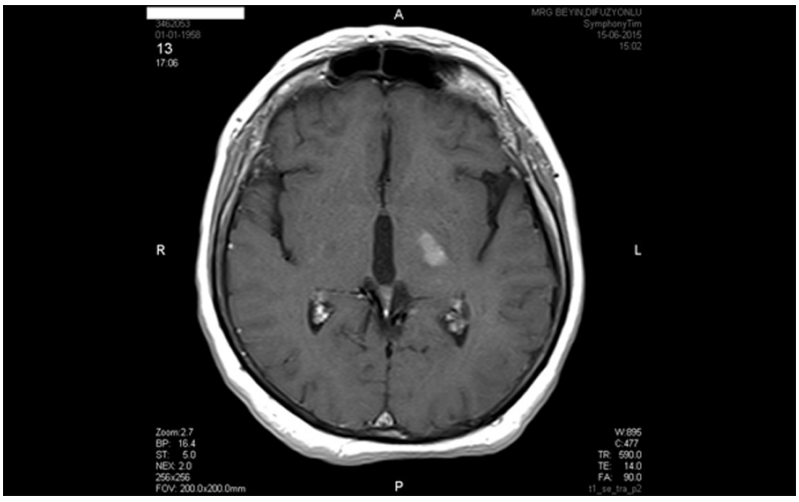

Figure 1. MR T1 image of the involvement. Contrast enhancement in the area that reaches from left internal capsula to crus cerebri throughout corticospinal tractus.

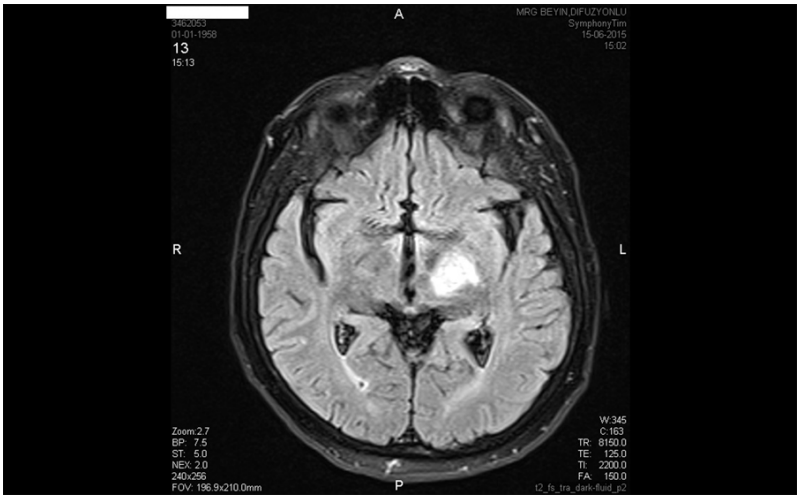

Figure 2. MR FLAIR image of the involvement. Contrast enhancement in the area that reaches from left internal capsula to crus cerebri throughout corticospinal tractus.

has revealed focal hypo density that lye from left thalamus inferior to internal capsule. Cranial magnetic resonance images of the patient were reported as, secondary leukemic infiltration of WM (**Figures 1** and **2**). In lumber punction analysis, lymphoplasmacytic cells mimicking neoplastic nature were observed. She was diagnosed as Bing-Neel syndrome. Our patients' cranial infiltrations were regressed after 4 cycles of R-MPV treatment.

Discussion

In literature there are papers reporting that WM may progress in the nervous system although it is not transformed in more malignant B cell lymphoma (Richter Syndrome) even if remission of the disease have achieved with the initial chemotherapy [3]. Also there are papers that report WM presenting as an isolated orbital mass with facial nerve palsy [4]. In another study, skull base, orbital, and per neural involvement in WM is reported [5]. Presence of neurological symptoms related with hyper viscosity is usual in WM. However leukemic infiltration of WM is extremely rare finding. To our knowledge there are very few reports regarding BNS. A study with 34 BNS cases proposed exposure to rituximab for treatment of BNS was associated with a better outcome [6]. Also, analysis of 44 BNS cases suggested diagnostic approach should be based on cerebrospinal fluid analysis and magnetic resonance imaging of the brain and spinal axis [7]. Moreover, there are some recently published case reports regarding BNS [8-21] (**Table 1**). Herein, we aimed to report a WM case with directly leukemic cranial involvement which manifests with neurological symptoms. BNS was first described in 1936 with the rapid neurodegeneration in patients who had hyperglobulinemia [22]. Syndrome is characterized with central nervous system involvement by neoplastic lymphoplasmacytoid and plasma cells [23]. As a result circulation around brain and eye blood vessel decreases, which leads to symptoms such as episodes of confusion, slurred speech, headache, fatigue, ataxia, memory problems, nausea, vomiting, and extremity numbness [24]. Generally complete blood count tests and other laboratory tests are normal in these patients. Magnetic resonance imaging is very important

Table 1. Summary of recent previous case reports regarding BNS

Age/Gender	Important Clinical Features/Outcome	Reference
59/M	Treatment efficacy with Ibrutinib in BNS	8
72/M	Control of neurological symptoms with ibrutinib in BNS	9
56/W		
60/M	BNS case with multilevel cord involvement and bihemispheric stroke that responded well to systemic and intrathecal therapies	10
80/M	Atypical presentation of BNS	11
57/M	BNS case with IgG-subtype lymphoplasmacytic lymphoma	12
58/M	Outlining the MYD88 L265P mutation detection by PCR in the CSF in BNS	13
69/M	DLBCL transformed from BNS	14
61/W	BNS case was lost after refusing treatment	15
51/M	Prolonged remissions are possible with different treatment approaches in BNS	16
77/M		
66/M		
67/W		
60/W	R-MPV regimen used for treatment of BNS, complete remission achieved	17
65/W	Modest clinical improvement with chemotherapy and cranial radiotherapy achieved in BNS	18
82/M		
64/M	Successful treatment of BNS case with Bendamustin-Rituximab	19
67/F	Effective treatment of BNS case with oral fludarabine	20
41/M		
70/F		
58/F		
76/M	BNS case with orbital infiltration	21

Abbreviations: F: Female, M: Male, BNS: Bing-Neel Syndrome, DLBCL: Diffuse large B cell lymphoma, PCR: Polymerase chain reaction.

in terms of making diagnosis [25]. Chemotherapy and radiotherapy is the treatment choices in this syndrome. To conclude, in a WM patient if neurological symptoms appear, the possibility of BNS should be kept in mind.

Disclosure of conflict of interest

None.

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