IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 22, Issue 6 Ser.6 (June. 2023), PP 50-53
www.iosrjournals.org

When Demyelination Is Both Central And Peripheral: Anti-Neurofascin 155 Antibodies Paranodopathy (A Case Report)

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BACKGROUND:
This case report showcases the occurrence of a rare entity of chronic inflammatory demyelinating polyradiculoneuropathy which is paranodopathy linked to Auto-antibodies against the paranodal proteins neurofascin-155 , and the efficacy of rituximab compared to other treatments in attaining clinical remission as confirmed in review articles that were carried out about the treatment of this disease .
KEYWORDS : *Paranodopathy , rituximab , chronic inflammatory demyelinating polyneuropathy , CIDP*

Date of Submission: 01-06-2023 Date of Acceptance: 10-06-2023

I. INTRODUCTION

Paranodopathies are characterized by the dysfunction of paranodal regions (adjacent to nodes of Ranvier) on myelinated fibers. They affect the central and/or peripheral nervous system.

the immunopathological mechanisms of patients with these antibodies are largely related to the disruption of the nodal or paranodal region structure, which is different from the peripheral nerve demyelination in typical chronic inflammatory demyelinating polyradiculoneuropathy (CIDP) [1]

II. CASE REPORT

We report the case of Mr. B.M, 32 years old male patient. Having the history of an undocumented congenital right blindness and a spontaneously reversible paraplegia at the age of 25 . The patient described an acute onset of rotatory vertigo one month prior to consultation, as well as impairment of the visual acuity of the left eye , and heaviness of the two lower limbs with paresthesia and balance disorders.

The clinical examination found a static cerebellar syndrome, a vestibular syndrome, and a peripheral sensory-motor neurogenic syndrome of the 4 limbs. MRI showed supra- ,sub tentorial and periventricular hyperintensity unenhanced after gadolinium injection.

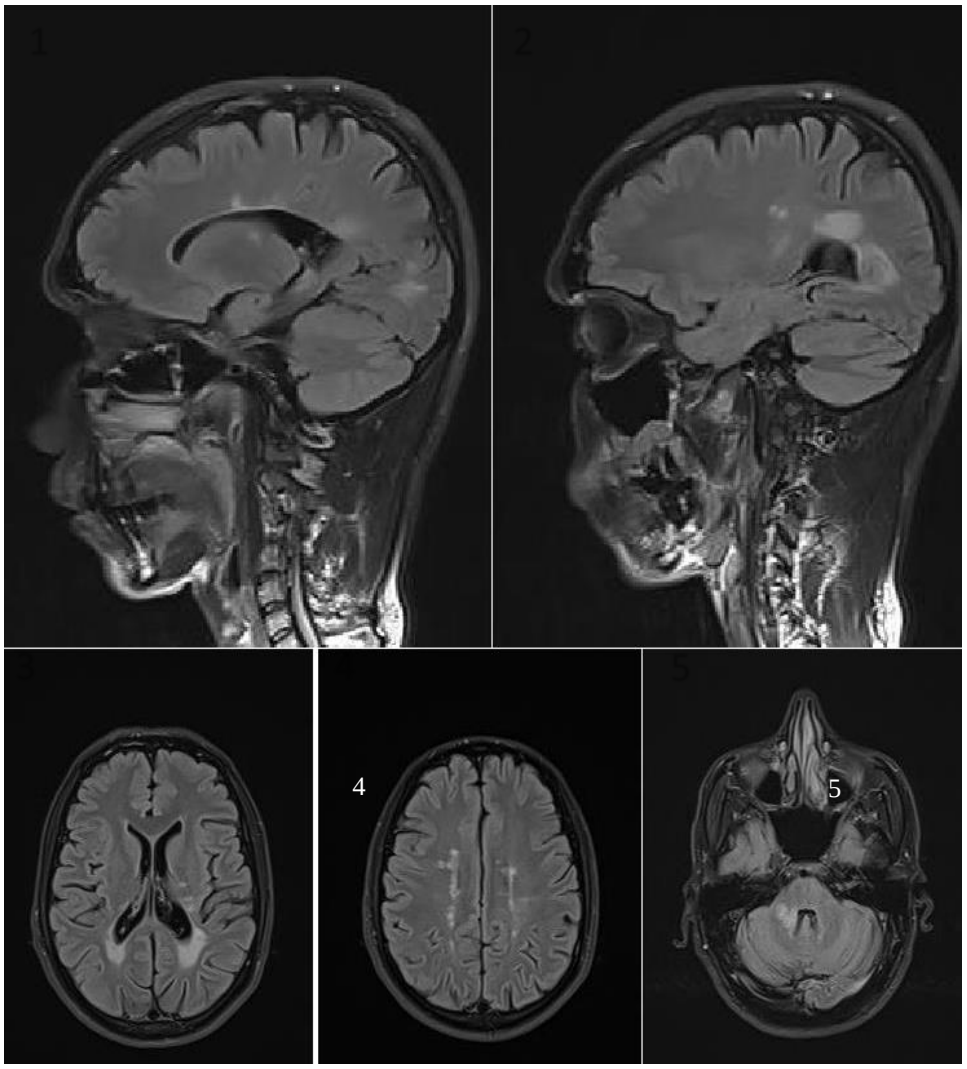

Figure 1 and 2 : Sagittal view of FLAIR MRI . Figure 3,4 and 5 : axial slices of FLAIR MRI showing demyelinating lesions in the supra- ,sub tentorial and periventricular regions

Electromyography displayed a demyelinating neuropathy pattern affecting the four limbs. Cerebrospinal fluid analysis pointed out high levels of protein. .

The patient was started on high dose methylprednisolone 1g/day during 3 days , leading to a transient improvement of the clinical picture , then received intravenous immunoglobulins leading to the same outcome . Later on , anti neurofascin antibodies 155 detection was tested positive .

The diagnosis of anti-neurofascin 155 antibody paranodopathy was retained based on clinical and paraclinical criteria , and rituximab was established at a dose of 500mg every 6 months , leading to complete remission .

VITESSE CONDUCTION MOTRICE

Test	Côté	Point de stim.	Lat., ms	Ampl., mV	Dur., ms	Surf., mV×ms	Stim., mA	Stim., ms	Dist., mm	Δ lat., ms	Vit., m/s
Médian											
1	D	poignet	2,9	3,5	4,56	7,9	33	0,3	80		
		pli coude	9,2	2,1	6,36	5,8	49	0,3	245	6,24	39,3
Cubital											
3	D	poignet	2,4	**5,9**	5,76	15,9	25	0,2	70		
		sous coude	8,3	**5,0**	7,0	14,7	40	0,2	280	5,88	**47,6**
Médian											
5	G	poignet	2,9	4,3	4,32	9,5	41	0,2	80		
		pli coude	9,9	3,4	4,96	8,9	43	0,2	288	7,04	40,9
Cubital											
8	G	poignet	2,2	**4,6**	5,28	12,5	40	0,2	70		
		sous coude	7,8	**4,0**	6,68	10,4	48	0,2	290	5,6	51,8
SPE											
12	D	Tête de péroné	4,3	**0,6**	5,08	1,7	53	0,5	300		
		creux poplité	14,8	**0,4**	4,16	0,8	53	0,5	400	10,5	**38,2**
SPI											
14	D	plante du pied	5,4	**1,0**	3,28	1,7	62	1	70		
		creux poplité	16,7	**0,4**	10,8	1,5	62	1	400	11,3	**35,3**
SPE											
15	G	plante du pied	4,6	**2,4**	4,4	5,6	40	0,5	70		
		Tête de péroné	14,8	**1,3**	6,16	3,7	40	0,5	380	10,2	**37,1**

Paramètres onde F

Test	Fmin lat., ms	F ampl., µV	M lat., ms	Fmin-M lat., ms	Vprox max., m/s
Abducteur 5e doigt, ULNAIRE C8 T1, D					
4	26,5		5,0	21,5	
Abducteur 5e doigt, ULNAIRE C8 T1, G					
9	43,3		5,0	38,3	
Abductor pollicis brevis, Medianus, C8 T1, D					
2	44,0		5,0	39,0	
Abductor pollicis brevis, Medianus, C8 T1, D					
6	41,4		5,0	36,4	
Pédieux, SPE L4 L5 S1, D					
13	23,0		5,0	18,0	
Pédieux, SPE L4 L5 S1, G					
16	23,0		5,0	18,0	

VITESSE CONDUCTION SENSITIVE

Test	Recueil	Site	Lat., ms	Ampl., µV	Dur., ms	Surface, nV×s	Stim., mA	Stim., ms	Dist., mm	Δ lat., ms	Vit., m/s
Median antidromique											
10	N. MUSCULOCUTANE (br terminale), C5 C6, D	poignet/III	1,3	3,3	0,9	1,7	15	0,1	90	1,32	68,2
Ulnaire antidromique											
11	N. MUSCULOCUTANE (br terminale), C5 C6, D	1	1,4	2,6	0,8	1,1	12	0,2	100	1,36	**73,5**

Tables 1 , 2 and 3 : demyelinating neuropathy of the four limbs in electromyography

III. DISCUSSION

Anti-neurofascin (NF) 155 antibody paranodopathy is typically manifested as a chronic inflammatory demyelinating polyradiculoneuropathy (CIDP), predominantly distal, particularly ataxic and sometimes associated with postural tremor. Clinical signs suggestive of central involvement can also be reported. The clinical phenotype also encompasses a young age at onset , The diagnosis is confirmed by the presence of increased CSF protein concentration [2] , a severe demyelinating neuropathy in electromyography , IgG4 subtypes of anti-neurofascin 155 antibodies , as well as cerebral and spinal MRI abnormalities . and a strong response to rituximab comprared to intravenous immunoglobulins (IVIG) and plasma exchange is characteristic to this entity [3;4;5;6;7;8].

The antibody-mediated attack results in detachment of terminal myelin loops and disruption of ion channels causing leakage , thus scattering of the driving current [9].

Patients with nodopathies of the NF155 antibody-positive subtype make up the majority of the data on management of nodopathies. [1]

Low dose rituximab induce a sharp decrease of the proportion of CD19+ B cells in the lymphocytes population , this decrease is sustained after 6 months [10] , meaning a rapid and prolonged response.

IgG4 autoantibodies against MuSK and IgG4 autoantibodies against NF155 decrease rapidly after CD20+ B cell depletion with rituximab. [11;12;13]

review articles have shown that The most effective treatments for IgG NF155-related nodopathy are plasma exchange (PLEX) (78%) followed by rituximab (75%), then steroids (56%), and lastly IVIG (32%). [14]

IV. CONCLUSION :

Paranodopathies caused by anti NF 155 antibodies are an entity that enables clinicians to evoke the diagnosis when faced with a picture of ataxic chronic inflammatory demyelinating polyneuropathy associated with central clinicoradiological involvement.

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