

Bariatric Beriberi with Encephalopathy following Roux-en-Y Gastric Bypass: A Case Report

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Setting

Tertiary care teaching hospital

Case Description

A 24-year-old female with past medical history of morbid obesity status-post Roux-en-Y Gastric Bypass 3 months ago presented with progressive bilateral lower extremity numbness and weakness over the last week. The patient initially felt pins and needles in her feet which ascended to her mid-thighs and then developed weakness. The patient was treated with IVIG but her symptoms worsened and she developed encephalopathy. MRI of the brain showed increased signal in the mammillary bodies, tectum, and periaqueductal grey matter. The patient was then started on intravenous thiamine and transferred to an acute rehabilitation for management of gait impairment, cognitive deficits, and nutritional deficiency.

Nerve Conduction Studies
Motor Summary Table

Site	NR	Onset (ms)	Norm Onset (ms)	O-P Amp (mV)	Norm O-P Amp	Neg Dur (ms)	Neg Area (mV*ms)	Site1	Site2	Delta-0 (ms)	Dist (cm)	Vel (m/s)	Norm Vel (m/s)
Right Median Motor (Abd Polli Brev)													
Wrist		2.5	<-4.2	10.1	>=4	5.47	33.94	Elbow	Wrist	3.8	19.5	51	>=50
Elbow		6.3		7.7		5.78	28.93						
Left Peroneal Motor (Ext Dig Brev)													
Ankle		5.8	<-5.5	1.9	>=2.5	5.31	6.22	B Fib	Ankle	8.0	32.0	40	>=40
B Fib		13.8		1.6		5.47	5.31	Poplit	B Fib	1.5	8.0	53	>=40
Poplit		15.3		2.8		5.78	9.07						
Right Peroneal Motor (Ext Dig Brev)													
Ankle		4.5	<-5.5	3.9	>=2.5	5.16	11.58	B Fib	Ankle	6.8	29.0	43	>=40
B Fib		11.3		3.4		5.94	10.37	Poplit	B Fib	1.7	7.0	41	>=40
Poplit		13.0		3.8		5.78	11.58						
Left Tibial Motor (Abd Hall Brev)													
Ankle		3.8	<-6.0	9.6	>=3.0	4.69	15.01	Poplit	Ankle	11.7	39.5	34	>=40
Poplit		15.5		3.0		4.33	5.32						
Right Tibial Motor (Abd Hall Brev)													
Ankle		3.8	<-6.0	9.2	>=3.0	3.91	12.44	Poplit	Ankle	10.4	39.0	38	>=40
Poplit		14.2		3.5		4.22	5.40						
Right Ulnar Seg Motor (Abd Dig Minimi)													
Wrist		3.0	<-3.4	13.4	>=4	5.31	31.45	B Elbow	Wrist	3.7	18.5	50	>=50
B Elbow		6.7		14.4		5.63	31.73	A Elbow	B Elbow	1.3	11.0	85	
A Elbow		8.0		12.2		5.47	26.73						

Sensory Summary Table

Site	NR	Onset (ms)	Norm Onset (ms)	O-P Amp (uV)	Norm O-P Amp	Site1	Site2	Delta-0 (ms)	Dist (cm)	Vel (m/s)	Norm Vel (m/s)
Right Median D2 Sensory (2nd Digit)											
Mid Palm		0.9		20.0	>=20	Mid Palm	2nd Digit	0.9	7.0	78	>=45
Wrist		2.0		14.8		Wrist	Mid Palm	1.1	7.0	64	
Left Sural Sensory (Lat Mall)											
Calf 1		0.9		3.8	>=10.0	Calf 1	Lat Mall	0.9	19.0	211	>=36
Right Sural Sensory (Lat Mall)											
Calf 1		0.9		30.3	>=10.0	Calf 1	Lat Mall	0.9	14.0	156	>=36
Right Ulnar Sensory (5th Digit)											
Wrist		2.4		28.6	>=18.0	Wrist	5th Digit	2.4	14.0	58	>=48.0

EMG

Side	Muscle	Nerve	Root	Ins Act	Fibs	Psw	Amp	Dur	Poly	Fascic	Recrt	Int Pat	Comment
Right	MedGastroc	Tibial	S1-2	Nml	1+	2+	Nml	Nml	Nml	0	Nml	Nml	
Right	AntTibialis	Dp Br Peron	L4-5	Nml	1+	2+	Nml	Nml	Nml	0	Nml	Nml	
Right	VastusMed	Femoral	L2-4	Nml	1+	3+	Nml	Nml	Nml	0	Nml	Nml	
Left	MedGastroc	Tibial	S1-2	Nml	1+	2+	Nml	Nml	Nml	0	Nml	Nml	
Left	AntTibialis	Dp Br Peron	L4-5	Nml	2+	3+	Nml	Nml	Nml	0	Nml	Nml	
Left	VastusMed	Femoral	L2-4	Nml	1+	3+	Nml	Nml	Nml	0	Nml	Nml	

EMG / NCS study depicting axonal polyneuropathy of the lower extremities

Case Diagnosis

Beriberi is caused by thiamine deficiency. Wet beriberi affects the cardiovascular system leading to tachycardia, shortness of breath, and lower extremity edema. Dry beriberi affects the nervous system leading to numbness, weakness, and pain. Serious cases may result in Wernicke's encephalopathy, presenting with ataxia, confusion, and ophthalmoplegia.

Discussion

The rise in morbid obesity has led to an increase in bariatric interventions. Early recognition of vitamin deficiencies and active supplementation is vital to prevent postoperative complications. Dry beriberi symptoms occur approximately 4-12 weeks postoperatively. Serologic analysis and MRI of the brain are useful to confirm the diagnosis. Beriberi may be mistaken with inflammatory neuropathies like Guillain-Barré syndrome because of its initial presentation of ascending weakness.

Conclusion

The benefits of bariatric surgery are well-known, however, it is vital for patients to understand the risks before and after surgery. Most nutritional deficiencies can be prevented with education and regular follow-ups. If a bariatric surgery patient presents with paresthesias, clinicians should strongly consider beriberi as a differential diagnosis. Patients with bariatric beriberi may benefit from a multidisciplinary approach to reach optimal improvement in their functional status. This may require a team of healthcare professionals including but not limited to a physiatrist, bariatric surgeon, neurologist, and physical therapists.

References:

Pacei F, Iaccarino L, Bugiardini E, Dadone V, De Toni Franceschini L, Colombo C. Wernicke's encephalopathy, refeeding syndrome and wet beriberi after laparoscopic sleeve gastrectomy: the importance of thiamine evaluation. Eur J Clin Nutr. 2020 Apr;74(4):659-662. doi: 10.1038/s41430-020-0583-x. Epub 2020 Feb 11. PMID: 32047291

Samanta D. Dry beriberi preceded Wernicke's encephalopathy: Thiamine deficiency after laparoscopic sleeve gastrectomy. J Pediatr Neurosci. 2015 Jul-Sep;10(3):297-9. doi: 10.4103/1817-1745.165732. PMID: 26557183; PMCID: PMC4611911