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Case Report Open Access

Guillain Barre Syndrome-like Presentation of Subacute Combined Degeneration of Spinal Cord and Association with Neuroendocrine Tumour of GIT

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Abstract

Subacute combined degeneration (SCD) refers to the gradually progressive myelopathic or myeloneuropathic presentation of vitamin B12 deficiency. While polyneuropathy has been well recognised with vitamin B12 deficiency, it has been debated whether neuropathy can manifest in isolation without myelopathy. SCD would seldom pose as a clinical or electrophysiological mimicker of Guillain-Barre syndrome (GBS). We describe the case of a middle age gentleman who presented with two weeks of rapidly progressive sensory predominant neuropathic syndrome with conduction findings consistent with a demyelinating process. In view of certain clinical-electrical discrepancies patient was further imaged with MRI revealing features classical of SCD with nearly undetectable Vitamin B12 levels. Upper gastrointestinal endoscopy as part of evaluation revealed a polyp in body of stomach with histopathological diagnosis of WHO II neurogastroendocrine tumour (carcinoid tumour) along with chronic atrophic gastritis. As far as to our knowledge, the association between gastric carcinoid and SCD have not been reported. We also discuss the relevant clinical points of this GBS-like presentation of SCD and possible pathomechanisms of the association with carcinoid. With parenteral Vitamin B12 supplementation patient had near complete resolution of symptoms and improvement in conduction parameters on follow-up.

Keywords: Guillain Barre Syndrome; Subacute combined degeneration; Carcinoid tumour; Myelopathy

Introduction

The neurological presentation of vitamin B12 deficiency can be varied, but most identifiable is as subacute progressive posterolateral myelopathic syndrome aptly named sub-acute combined degeneration of spinal cord (SCD) or as a myeloneuropathy. While polyneuropathy has been well recognised with Vitamin B12 deficiency, it has been debated whether neuropathy can manifest in isolation without myelopathy [1]. With a gradually progressive course, subacute combined degeneration would seldom pose a clinical or electrophysiological differential to Guillain Barre Syndrome (GBS). Through the current report, we describe a case of SCD, mimicking GBS, with further workup revealing a hitherto unreported association with gastric carcinoid tumour.

Case Report

This 52 year old gentleman was referred to us with rapidly progressing neurological symptoms and presented thirteen days after symptom onset. He initially noted tingling paresthesia which he likens to "electric shock" and "pins and needles" over tips of all fingers bilaterally. The next day he noticed similar sensation over bilateral toes as well but of lesser intensity. The progression and severity were more for upper limb and the paresthesia ascended up to elbow and followed by the same sensations over legs till knee. One week later he noted distal hand clumsiness in the form of difficulty in picking notes from pocket, dialing mobile phones, buttoning shirts and using fingers for handling food items. At the same time he also noted loosening of footwear without awareness and difficulty insinuating feet into footwear unless guided with hand. Two days prior to presentation, he felt unsteadiness with swaying to either side while walking. There was no nocturnal worsening of gait or wash-basin phenomenon. There were no other constitutional complaints, preceding infections or vaccinations. He was on a non-vegetarian diet. His examination was notable for impairment of vibration and joint position sense in bilateral upper and lower extremities, pseudoathetosis of both hands and mild proximal lower limb weakness. His deep tendon reflexes in upper limb was sluggish and was absent in lower limb with flexor plantar response.

The clinical possibility of sensory ganglionopathy or a sensory predominant AIDP was considered. His NCV on day of presentation showed a symmetric demyelinating sensori-motor neuropathy predominantly affecting lower limbs. However since the upper limb symptoms and signs were more severe in the face of preserved upper limb SNAPs, a possible preganglionic or posterior column localisation was considered and MRI was done. His MRI revealed changes typical for SCD (Figure 1). Meanwhile his blood routine showed florid features of macrocytic anemia with extremely low serum Vitamin B12 levels (<50 pg/ml) (Table 1). Serological study for antiparietal cell antibody was negative. Since dietary deficiency was unlikely a possibility of pernicious anemia was considered and OGD scopy was done which revealed antral gastritis, evidence of *H. pylori* infection along with a 10 mm polyp in the body of stomach which was excised. The histopathological diagnosis was of WHO grade II

neurogastroendocrine tumour (carcinoid) along with severe chronic atrophic gastritis. CT scan of abdomen did not reveal other tumours of gastrointestinal tract. He was subsequently initiated on parenteral Vitamin B12 supplementation. At 2 months follow-up he had significant improvement in all his symptoms, except for mild paresthesia of both hands. His repeat nerve conduction study showed improvement in conduction parameters with near normal F wave latencies and reappearance of lower limb SNAPs.

Discussion

Deficiency in s-adenosyl cobalamine vital for succinyl CoA synthesis and reduced tetrahydrofolate reductase impairing cell turnover have been theorized as the key factors leading to SCD [2,3]. Recently there has been evidence for interplay between increasing levels of myelinotoxic cytokines and decreasing levels of myelinotrophic IL-6 and EGF in CSF in SCD pathogenesis [4]. Traditionally SCD have been recognised as gradually progressive neurological manifestation of chronic Vitamin B12 deficiency. In most studies, the mean duration of symptoms ranges from 4 months [5] to 11 months [6]. Acute presentations of SCD have been seldom reported in literature. Shukla describes a series of five patients with SCD all of whom had presented acutely, with duration of symptoms ranging from 6-15 days [7]. However, in all of them the presentation was as acute posterior or posterolateral myelopathy with no mention of neuropathy.

In the absence of Lhermitte phenomenon and girdle sensation, brisk DTR and other pyramidal signs, the clinical localisation for a glove and stocking sensory impairment would be more in favour of peripheral neuropathy. As exemplified in this case, the duration of symptoms, rapidity of progression, and absence of deep tendon reflexes and presence of abdominal reflex would raise the clinical possibility of ganglionopathy or sensory predominant AIDP. The nerve conduction study was consistent with a demyelinating sensorimotor neuropathy. Vitamin B12 deficiency has been known to manifest as polyneuropathy, however the electrophysiological pathology has been a point of contention. Early studies by McCombe employing sural nerve biopsy argued in favour of axonal degeneration [8]. More recently Saperstein examining patients with cobalamin deficient neuropathies noted none of the patients to have evidence of demyelination in nerve conductions studies [1]. On the other hand Steiner and recently Puri have clearly highlighted the conduction parameters consistent with demyelination in patients with low Vitamin B12 levels [9,10]. It could be argued that the pathology depends at what stage the disease is captured, with demyelination being the predominant feature early in the course and secondary axonal changes setting in later. The present case could provide evidence for this hypothesis.

In the current case MRI was ordered due to the clinical- electrical discordance wherein the sensory deafferented upper limbs had essentially normal SNAPs. A predominant LMN involvement due to neuropathy must have masked the clinical feature of pyramidal/ posterolateral cord involvement from manifesting.

The American Society for Gastrointestinal Endoscopy recommends a single endoscopic evaluation at the diagnosis of pernicious anemia. This is largely to confirm gastritis and since patients with pernicious anemia have a 2-3 fold increase in risk in incidence of gastric cancer [11]. Neurogastroendocrine tumours are associated with chronic atrophic gastritis and often pernicious anemia [12]. The incidence of carcinoid tumours in patients with PA is as high as 10% [13]. Endoscopically tumours appear as polypoidal lesions with central ulceration. Prevailing theories of etiopathogenesis point to high gastrin load which is seen in atrophic gastritis driving enterochromaffin cells proliferating into carcinoid tumours. These are usually diagnosed on routine OGD related to chronic gastritis and anemia. The consensus in the management of gastric carcinoids is that WHO grade III carcinoids are treated surgically with extensive resections as for adenocarcinoma while options for type I and II include surveillance, endoscopic polypectomy or resection.

While the association between gastric carcinoid and pernicious anemia is rare but well documented there have been no reports of association with neurological manifestations of Vitamin B12 deficiency. It is interesting to note that while presence of gastric carcinoid and atrophic gastritis points to a chronic process, the neurological manifestation was acute. This may point to an unidentified mechanism which has abruptly tipped the balance triggering off the neuropathogenic process, which leads to clinical manifestation. Whether the association with carcinoid is of relevance as far as neurological manifestations is concerned, remains presently undetermined and future reports are necessary to clarify the significance. In their series, Misra et al had not noted any difference in the clinical picture of SCD between patients with and without antiparietal cell antibodies [6]. However, in the current case the etiology of SCD might have been chronic atrophic gastritis related to *H. pylori* infection rather than pernicious anemia especially with absence of evidence for autoimmune gastritis and positive serological and rapid urease test. In fact it has been argued that intrinsic factor negative atrophic gastritis could have been initiated by *H. pylori* infection [14].

Without a careful scrutiny our patient could well have received immunoglobulins and had in fact been referred as GBS. However, the haematological parameters could alert the clinician to an alternate disease process. The association with carcinoid with SCD needs to be explored further but an upper gastrointestinal endoscopy should be considered mandatory in any middle-aged person with Vitamin B12 deficiency.

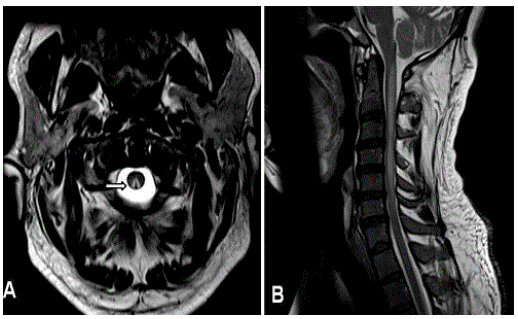

Figure 1: MRI T2 weighted images axial (A) and sagittal (B) sections.

Figure 1 showing the intrinsic cervical cord hyperintense signal changes predominantly affecting the posterior columns with the characteristic inverted 'V' appearance in axial section (arrow).

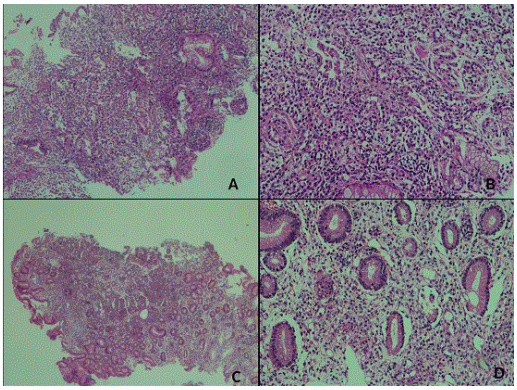

Figure 2: H&E stains of biopsy from gastric polyp (A: Magnification 4X) and B: Magnification 10X)) and gastric mucosa (C: Magnification 4X) and D: Magnification 10X)).

Figures 2A and 2B show nests of tumour cells with features of neuroendocrine neoplasm in the lamina propria of gastric mucosa. Figures 2C and 2D show atrophy of gastric glands, moderate inflammation and pseudopyloric metaplasia suggesting chronic atrophic gastritis.

Hb	10.1 mg/dl
MCV	107.5 fL
MCHC	34.3
Serum Ferritin	96.6 (30-400 ng/ml)
Serum Iron	128 (59-158 µg/dl)
Serum Vitamin B12	<50 (197-866 pico gm/ml)
Peripheral Smear	Macrocytic anemia, hypersegmented neutrophils and evidence of mild hemolysis
Morning serum cortisol	(7 AM-10 AM)-14.8 (6.2-19.4 µg/dl)
TSH	TSH 7.93 (0.27-0.42 µIU/ml)
Antiparietal cell antibody	Negative

Table 1: Summary of relevant blood investigations.

References

1. Saperstein D, Wolfe G, Gronseth G, Nations S, Herbelin L, et al. (2003) Challenges in the identification of cobalamin-deficiency polyneuropathy. Arc Neurol 60: 9.
2. Hemmer B, Glocker F, Schumacher M, Deuschl G, Lucking C (1998) Subacute combined degeneration: Clinical, electrophysiological, and magnetic resonance imaging findings. J Neurol Neurosurg Psychiatry 65: 822-827.
3. Gürsoy A, Kolukısa M, Babacan-Yıldız G, Çelebi A (2013) Subacute combined degeneration of the spinal cord due to different etiologies and improvement of MRI findings. Case Rep Neurol Med 1: 5.
4. Scalabrino G (2005) Cobalamin (vitamin B12) in subacute combined degeneration and beyond: traditional interpretations and novel theories. Exp Neurol 192: 463-479.
5. Healton E, Savage D, Brust J, Garrett T, Lindenbaum J (1991) Neurologic aspects of cobalamin deficiency. Medicine 70: 229-245.
6. Misra U, Kalita J (2007) Comparison of clinical and electrodiagnostic features in B12 deficiency neurological syndromes with and without antiparietal cell antibodies. Postgrad Med J 83: 124-127.
7. Pandey SV, Holla V, Rizvi I, Qavi A, Shukla R (2016) Can vitamin B12 deficiency manifest with acute posterolateral or posterior cord syndrome?. Spinal Cord Ser Cases 2: 16006.
8. McCombe P, McLeod J (1984) The peripheral neuropathy of vitamin B12 deficiency. J of the Neurol Sci 66: 117-126.
9. Steiner I, Kidron D, Soffer D, Wirguin I, Abramsky O (1988) Sensory peripheral neuropathy of vitamin B12 deficiency: A primary demyelinating disease?. J Neurol 235: 163-164.
10. Puri V, Chaudhry N, Goel S, Gulati P, Nehru R, et al. (2004) Vitamin B12 deficiency: a clinical and electrophysiological profile. Electromyogr Clin Neurophysiol 45: 273-284.
11. Nguyen VX, Le Nguyen VT, Nguyen CC (2010) Appropriate use of endoscopy in the diagnosis and treatment of gastrointestinal diseases: Up-to-date indications for primary care providers. Int J Gen Med 3: 345.
12. Dempsey D (2006) Gastric Carcinoids: Biologic behavior and prognosis after differentiated treatment in relation to type. Yearbook of Gastroenterology 2006: 205-206.
13. Hagarty S, Hüttner I, Shibata H, Katz S (2000) Gastric carcinoid tumours and pernicious anemia: Case report and review of the literature. Can J Gastroenterol 14: 241-245.
14. Amarapurkar DN, Amarapurkar AD (2010) Intrinsic factor antibody negative atrophic gastritis; is it different from pernicious anemia?. Trop Gastroenterol 31: 266-270.