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Case Report

Atypical Presentation of Parkinson's Disease-Corticobasal degeneration

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Abstract:

Corticobasal degeneration (CBD) is a sporadic, rare, slowly progressive disorder with a clinical asymmetrical onset characterized by apraxia, dystonia, postural instability and akinetic –rigid syndrome that does not respond to levodopa. CBD usually presents at mid to late adult life. We describe an example of this rare case after taking consent from patient. A 45 years old women initially presented with walking difficulties and involuntary movement and pain in the left side. Previously she was diagnosed as a case of Parkinson's disease but was unresponsive to drug. On examination, she presented with left upper limb fixed dystonia, spasticity in all four limbs. Brain MRI showed asymmetrical cortical atrophy in the left frontotemporal cortex. Neuropsychological examination showed an impairment in visuospatial functioning, frontal-executive dysfunction. This case demonstrates that association of asymmetrical focal cortical (apraxia, dementia, progressive nonfluent aphasia) and subcortical features (bradykinesia, tremor, asymmetrical limb dystonia, gait disorder) remains the clinical hallmark of this condition. There are no absolute markers for the clinical diagnosis that is complicated by the variability of presentation involving also cognitive symptoms that are reviewed in the paper.

Introduction:

Corticobasal degeneration is a rare variety of neurodegenerative disease described for the first time by Rebeiz et al.[1] This can be presented with an exceptional variety of motor, sensory, behavioral and cognitive symptoms.[2] It is usually presented with asymmetrical parkinsonism more affecting a limb, where arm is frequently involved.

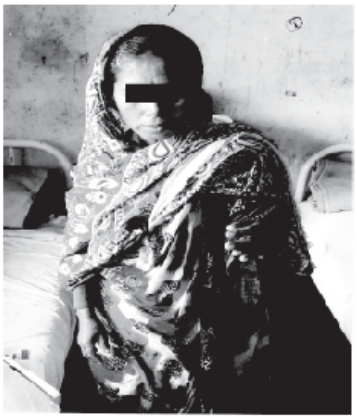

Figure-I: Alien limb deformity

The most common presentation of the parkinsonian syndrome is rigidity followed by bradykinesia, gait disorder associated with postural instability and falls, tremor, asymetrical limb dystonia. Other cardinal feature is higher cortical dysfunctions like apraxia where limb is more common than orofacial and ocular apraxia. There is some other presentation of corticobasal degeneration such as dementia, progressive nonfluent aphasia, speech apraxia, progressive supranuclear palsy (PSP) and posterior cortical atrophy syndrome.[3,4]

In Corticobasal degeneration, there is abnormal deposition of the microtubule associated protein tau which is also found in frontotemporal dementia and progressive supranuclear palsy.[5] The common pathological findings in CBD are focal asymmetric cortical atrophy, nigral degeneration, tau positive neuronal and glial lesions in both gray and white matters.[6] For accurate diagnosis, we can take help from neuropsychology, electrophysiological study and imaging methods. They also help us to differentiate this disease from the other parkinsonism syndrome.[3,4] In CBD, it is very difficult to understand the symptoms; as because patient can't share their experiences properly. A sound knowledge of this disease may help clinician to make diagnosis, providing comprehensive information about prognosis and difficulties they will encounter during the course of the disease, improving their quality of life and careers.

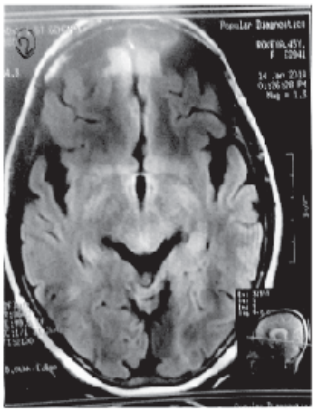

Figure 2: Axial T2 weighted MRI image of the brain, demonstrating asymmetrical frontal and temporal lobe atrophy in the right side.

Case Report:

A 45 years old, hypertensive, non-diabetic daughter of non-consanguineal parents presented to us with the history of difficulty in walking for two months, involuntary movement and pain in the left upper limb for 4 months, tingling sensation in all four limbs for same duration. Two months prior to the admission she felt difficulty in walking which was insidious in onset and gradually progressive. She gave history of short stepping gait with recurrent fall during walking during this time. She gave no history of stroke, weakness in lower limbs but gave history of sensory impairment, muscle wasting. She also developed involuntary movement and pain in the left upper limb. Involuntary movement was spontaneous, minimally affected by mental effort. She was unaware of the movement of the left upper limb. She also mentioned about tingling sensation in all four limbs. But she had no history of neck pain, trauma to the neck, weakness and wasting of limbs. She was hypertensive and controlled by Tab. Amlodipine and Olmesartan combination. On examination she was expressionless, pulse-70b/m,BP-was 150/90 mm Hg (supine) and 140/80mmHg(Standing), she was concious but confused ,disoriented about place and person, speech was soft and incoherent. Her mini-mental scoring was 20, her memory was impaired along with cognitive impairment. She had significant apraxia. Her cranial nerves including fundus were normal. Muscle power was grade 4 in the left upper limb but normal muscle power in the rest of the limbs.There was dystonic and catching type of involuntary movement found more in the left side as well as resting and action tremor. All deep tendon reflexes were brisk and Hoffman's sign was present in the left side,planter flexor in both side with presence of glabeller tap. On sensory system examination we found that all modalities of sensation including cortical sensation lost in the left upper limb. Cerebellar sign was absent. Gait was short stepping with no arm swinging during walking. But there was Alien limb like deformity as well rigidity. (Figure-1) Other system examiantion found normal.

Relevant investigation showed:TLC-10,000/cmm, N-73%,L-23%,Hb-11.6 gm/dl,ESR- 20 mm in 1st hr.RBS-5.8 mmol/L,S.urea-21 mg/dl,S.creatinine-1.0mg/dl,s.Sodium-131 mmol/L,Potassium-3.2 mmol/L,VDRL-Non reactive, Cervical spine Xray-Normal, Left shoulder joint Xray-Normal, Xray lumbosacral spine-spodylosis of L5 vertebra,USG whole abdomen –Normal, RA test –negative,CRP-normal,INR-1.02,Triple antigen –Normal, TSH-0.87uIU/ml,H.pylori –IgG-Positive, Liver function –Normal, MRI of Brain-Assymetrical frontal and temporal lobe atrophy with widening of sylvian fissure and interhemispheric fissure.(Figure-2)

We immediately started antihypertensive, levodopa, rivastigmine and antidepressant after admission but one-week later patient was less responsive to drugs. Then we started extensive search for etiology. Related to clinical features, based upon diagnostic criteria proposed by Boeve et al.4, she has been diagnosed as "corticobasal degeneration (CBD)".The diagnosis was based on the gradual onset of a parkinsonian disorder associated with cortical dysfunctions and other supportive features such as cognitive dysfunction, asymmetric atrophy on MRI imaging .She was treated by antiparkinson's drug with rivastigmine, antidepressant and advised for regular follow up.

Discussion:

CBD is a rare form of dementia that is caused by an over production of a protein in the brain called tau. This build up of tau protein causes area of the brain to become increasingly damaged and to shrink over time. The part of the brain that are mostly affected by CBD are the cortex and basal ganglia. As the cortex is responsible for higher level of cognitive functioning like thinking and understanding and the basal ganglia helps to perform smooth movement. CBD may affect both the physical and cognitive functioning of the people with the disease.

Clinically CBD begins in the sixth to eight decades.[7] with slight predilection for women.[8,9] Our patient was also female and present manifestation during 5th decade. Typically, the primary symptom develop in a profoundly asymmetric way, affecting either one arm or, less

frequently, a leg, which appear to be rigid, dystonic, akinetic, or apraxic. Clinical feature include a series of motor, cognitive and neuropsychiatric symptom, that can be explained by impairment of the cortical and subcortical structures. Motor symptom include progressive asymmetric rigid akinetic parkinsonism usually involving the upper limbs with resting tremor,[10] focal stimulus sensitive or action myoclonus,[4,11] speech abnormality, gait disorder, with postural instability and falls and asymmetric limb dystonia, generally of the upper limbs, sometimes evolving towards the development of a dystonic clenched fist.[3,12] Our patient was also presented to us with asymmetrical limb dystonia ,involuntary movement like resting and action tremor, gait disorder with postural instability and falls.

Involvement of higher cortical function as well as cognitive impairment results in often symmetric ideomotor apraxia, mostly affecting the limb. The alien-limb phenomenon, that is seen in 50% of the cases.[13] It commonly co-occurs with cortical sensory loss.[11,14] Our patient also having significant apraxia along with alien limb phenomenon with marked cognitive impairment. Cortical sensory loss was present in 14 of the 16 patients in an early series and was the sole initial symptom in these patients.[15] Affected patient often complain of numbness and tingling sensation. Our presenting case also complained tingling sensation in all four limbs. On examination we found that all modalities of sensation including cortical sensation was lost in all four limbs but more marked in the left upper limb.

Morphologic imaging of the brain may demonstrate asymmetrical cortical atrophy, usually frontal, temporal and parietal lobe, although normal in the early phase of the disease. Asymmetrical atrophy in the basal ganglia, corpus callosum, lateral ventricle and cerebral peduncle may be present.[16,17] Our patient also having asymmetrical frontal and temporal lobe atrophy which was shown in MRI of brain. Finally, The main features of disease are insidious in onset and progressive, no identifiable cause (tumor, infarct) of symptomatology, cortical dysfunction includes at least one of the following: (i) focal or asymmetric ideomotor apraxia, (ii) alien limb phenomena, (iii) cortical sensory loss, (iv) visual or sensory hemineglect, constructional apraxia, (v) focal or asymmetrical myoclonus, (vi) apraxia of speech/nonaffluent aphasia. Extrapyramidal dysfunction as reflected by one of the following: (i) focal or asymmetrical appendicular rigidity lacking prominent and sustained L-dopa response, (ii) f ocal or asymmetrical appendicular dystonia. Our patient presented to us with both cortical dysfunction as well as extrapyramidal dysfunction such as: memory and cognitive impairment, apraxia, cortical sensory loss, asymmetrical involuntary movement and dystonia, walking difficulties due to rigidity and postural instability.

Treatment includes levodopa, amantadine, baclofen and inj. Botox. in jerky movement levitiracetum, for memory impairment donepezil, memantine can be used. In one study showed ninety-two percent of the case patients received some kind of dopaminergic medication. Eighty-seven percent received levodopa with a peripheral decarboxylase inhibitor; 25%, either bromocriptine or pergolide mesylate; 20%, selegiline hydrochloride; and 16%, amantadine hydrochloride. Other medications used were benzodiazepines (32%), anticholinergics (27%), baclofen (19%), antidepressants (11%), anticonvulsants (9%), propranolol hydrochloride (8%), and neuroleptics (4%). Botulinum toxin injections were given to 6% of the case patients14.Our patient was treated by levodopa, rivastigmine, antidepressant and physiotherapy and patient was improved quickly.

Conclusion:

CBD can be presented with several clinical syndromes. It is more difficult to diagnose this heterogeneous disorder and misdiagnoses are frequent. Other neurodegenerative disorder sometimes overlaps the CBD, making the clinical diagnosis difficult. Currently, there is no known cure for CBD. Medications that are often used to manage symptoms of Parkinson's disease can be tried in CBD but are usually not as effective. So, It is important to explain the nature of the motor as well as the cognitive deficits to the patients as well as to all people involved in their care.

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