

The olivopontocerebellar atrophies

Report of 4 cases

A. Razif A. Razak, MD
Trainee Lecturer
Department of Paediatrics

R.C. Pratap, MBBS, DM (Neurology)
Assoc Professor and Head,
Department of Medicine

A.K. Gururaj, MBBS, DCh MD, MMed, MRCP
Lecturer
Department of Paediatrics
University Hospital, Universiti Sains Malaysia, Kubang Kerian, Kelantan

Summary

Four cases of olivopontocerebellar atrophy of the sporadic (Dejerine Thomas) and hereditary (Menzel) types are described. The clinical features, computed tomography (CT) findings and treatment options of this heterogeneous disorders are discussed.

Key words: Olivopontocerebellar atrophies, Cerebellum.

Introduction

Olivopontocerebellar atrophy (OPCA) is a rare condition with a prevalence estimated to be 5 per 100,000 of all hereditary ataxias.¹ The term was first coined in 1900 by Dejerine and Thomas and since then, there have been numerous publications on OPCA, its variants and classification. In the past decade, CT scan findings have been described extensively. This has allowed us to image the gross anatomical changes and correlate them with the clinical features.

Case One

A 73 year old Malay man presented with a history of progressive weakness of the lower limbs of about two months, which was described as an inability to cycle and walk due to unsteadiness of gait. His blood pressure was 140/85 with no postural drop. No carotid bruit was heard. His higher mental functions and cranial nerves were normal. Motor power was normal except in the muscle groups of the left upper limb which were grade 4/5. There was also hypotonia involving only the left upper limb. Sensation was normal. Deep tendon reflexes were present in both upper limbs but the ankle and knee jerks were both absent. Plantar reflex was flexor on the left and equivocal on the right. The patient had ataxic gait, dysmetria and dysdiadochokinesia of the left upper limb. Examination of cardiovascular, respiratory and gastrointestinal system revealed no abnormality. Skull X-ray was normal. CT scan showed cerebellar and pontine atrophy with widening of the prepontine cistern and cisterna magna (Fig 1). The patient was given Piracetam 400mg BD and limb physiotherapy. There was no change over a two years follow up period.

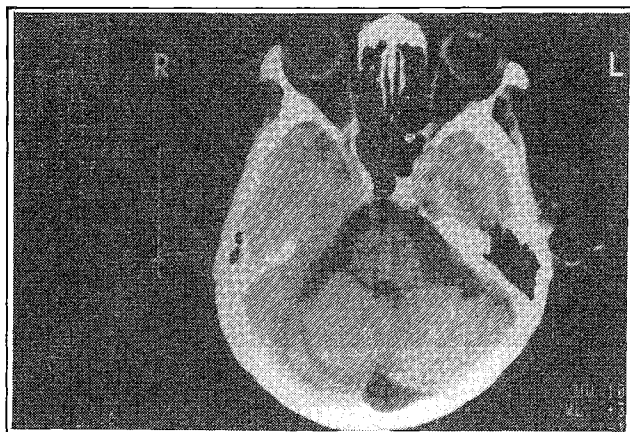


Fig. 1 CT scan showing cerebellar and pontine atrophy with widening of prepontine cistern and cisterna magna.

Table I
Summary of clinical features and CT scan of the reported cases

| | Age Sex | Presenting complaint | cerebellar signs | HMF | Cra n. | Motor Power | Tone | Sens. | Ref- lexes | FH | Treat- ment response | CT scan features |
|--------|-----------------------------|-------------------------------|---|-----|-----------|-----------------------------|------|---|---|-----|----------------------------|---|
| Case 1 | 73 years old Male | Weakness unstead- iness | Ataxia, dysmetria, intention tremor, dysdiado- chokinesia | N | N | 5/5 except LUL 4/5 | R | N | Absent knee and ankle jerks. Babins- ki neg | nil | poor | cerebellar atrophy, pontine dilated 4th ventricle, dilated cisterna magna. |
| Case 2 | 60 years old Male | Unsteady gait | Ataxia | N | N | 5/5 | N | N | same as above | nil | poor | cerebellar atrophy, dilated 4th ventricle. |
| Case 3 | 11 years old Male | Weakness unstead- iness | Ataxia, dysmetria, intention, tremor, dysdiadocho- kinesia | N | N | 4/5 | R | Loss of 2 point discrim- ination, propio- ception, vibration | N | yes | poor | cerebellar atrophy, pontine atrophy, dilated 4th ventricle. |
| Case 4 | 4 years old Female | Unable to walk | Ataxia | N | * | 4/5 | N | * | N | yes | NA | cerebellar atrophy, dilated 4th ventricle, dilated cisterna magna. |

HMF = Higher mental functions. Cra = Cranial nerves. Sens. = Sensation. FH = Family History. N = Normal. R = Reduced. * = not fully elicited. NA = not available.

Case Two

This 60 year old man presented with a 3 year history of back pain, unsteady gait and erectile impotence. The pain was continuous and radiated to the lower limbs. There was no history of injury to the head or back or similar problems in the family. On examination the blood pressure was 120/80 with no postural drop and the pulse was 80/min regular. The patient had an ataxic gait and a positive knee-heel test. The ankle jerks were absent but knee jerks were elicited with reinforcement. Posterior column sensation was intact. Neurological assessment was otherwise normal. ECG, skull and chest X-rays did not reveal any abnormalities. CT scan showed early cerebellar atrophy with prominent prepontine cistern. The patient was given acetazolamide 250 mg, but no response was seen over three months.

Case Three

A 11 year old Malay boy, presented with weakness and unsteadiness while walking since early childhood. He was delivered at full term, birth weight of 7lbs with no perinatal complications. His gross motor development milestones were initially good as he was able to turn over at 3 months and crawl at 5 months. Subsequently he was only able to stand with support at 3 years, walk with support at 4 years and walk without support at 7 years. He was able to feed himself and speak monosyllables at 2 years. He is a product of consanguinous marriage and is the 2nd of 5 children. His younger sister, the 4th child and uncle are similarly afflicted with unsteadiness and difficulty in walking.

On examination, the child was cooperative and alert. Blood pressure and pulse were normal. There were no Kayser Fleischer rings, neurocutaneous stigmata or telangiectasia. The patient's higher mental functions were quite normal. There was evidence of slow scanning speech and nystagmus. Other cranial nerves were intact. The motor power of all the limbs was grade 4/5 and equal in the proximal and distal muscle groups. There was slight hypotonia, deep tendon reflexes were normal and plantars were flexor. There was loss of joint, position, vibration sense and of two point discrimination. Positive cerebellar signs were dysdiachokinesia, dysmetria, intention tremor and broad based ataxic gait. The heart, lungs and gastrointestinal systems were normal. The hematological counts, serum electrolytes and urine screening tests for some inborn errors of metabolism (reducing sugar, ferric chloride and chromatography) were normal. The serum ceruloplasmin was normal. The skull X-ray was normal and CT scan of the brain showed atrophy of cerebellum and pons with dilatation of the fourth ventricle.

Case Four

This 4 year old Malay girl is the younger sister of the patient described in Case 3. She presented with inability to walk without support. Her disability was not obviously progressive and she was able to carry out fine motor movements with difficulty. Physical examination revealed a shy child with normal vital signs. Muscle power was grade 4 and equal in distal and proximal groups with no wasting. Truncal ataxia was present. Intention tremor and dysdiachokinesia were also noted. Reflexes were normal and Babinski's sign was negative. Full blood picture, serum electrolytes and ceruloplasmin levels were normal. Skull X-ray did not reveal any abnormality. The CT scan showed wide 4th ventricle and large cisterna magna. The vermis of the cerebellum was atrophied. Physiotherapy was instituted but no specific medications were given.

Discussion

OPCA is a heterogenous clinical entity. The classification of this disease underwent numerous changes as more variant cases were reported. Recently, Duvoisin¹ published a classification scheme with 2 major headings (a) sporadic and/or recessively inherited and (b) dominantly inherited.

The aetiology of OPCA is not quite established but it is generally thought to be a primary demyelinating disease. A single biochemical defect was also suggested as causing the neuronal changes in OPCA.² Excessive acidic neurotransmitters such as aspartate and glutamate which are neurotoxic and slow viruses have also been implicated as the cause of OPCA.³ The clinical manifestations described by Dejerine — Thomas in their 2 patients were unsteadiness in walking and standing, fatigue, slowness and hesitation of movements. Other features were fixed facial expression, awkwardness of the hands, minimal action tremors, a slow scanning speech and broad based gait. Deep tendon reflexes were increased with normal plantars. The vision, fundus and sensations were normal. Intellectual capabilities were preserved.⁴ In case one and two of the present study, progressive unsteadiness of gait, absence of a family history and cerebellar signs places them in the sporadic group of OPCA. The impotence described could well be due to autonomic failure. Nerve conduction studies by Rossi et al detected decrease in sensory potential amplitudes in OPCA patients although only 2 patients had clinical sensory loss.⁵ The brother and sister described in case three and four developed difficulty in walking and ataxia with cerebellar signs. The brother also showed involvement of the posterior column similar to Menzel's prototype case. Thus both the brother and sister would be classified as the hereditary/Menzel's type. Symptoms have been described as early as at 11 months.⁶

The CT scan has enabled us to diagnose and follow the progress of the disease. Huang and Plaitikias³ utilised the CT scan to study structural brain changes of various types of OPCA. The major radiological findings in the OPCAs described by them are cerebellar atrophy, brachium pontis atrophy, enlargement of the 3rd and 4th ventricles. Features peculiar to certain types of OPCA were mesencephalic atrophy, midbrain, frontal lobe and parietal atrophy. All of the four patients described showed CT scan changes of cerebellar atrophy and dilatation of the 4th ventricle. One patient also had pontine atrophy and another had atrophy of the vermis of the cerebellum.

There is no curative treatment for OPCA. Symptomatic or palliative treatment could be offered but is usually not adequate. Recent developments of neuropeptide research has led to the trial of thyrotrophin releasing hormone as it is shown to be an important neuromodulator affected in neurological diseases.¹¹ Clinical awareness of this entity, early diagnosis of the disease and its pattern of inheritance may have important implications for prevention by genetic counselling.

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