## Case Report

# Isolated Infarction of the Medullary Pyramid – A Rare Pure Motor Stroke

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Acute pure motor hemiparesis can occur due to a vascular insult along the cortico spinal pathway. Rarely such a stroke can occur as a result of involvement of the pyramids located on the ventral aspect of the medulla. Neurological localization can be difficult in such strokes and moreover they can also pose imaging challenges since they are missed on the CT scans. So far only 4 such cases have been reported in literature. Here we present two cases of pure motor strokes caused by infarction of the medullary pyramids. We have described the anatomical correlates of the symptoms and signs and also highlight the importance of MRI in picking up these rare strokes. **Key Words:** Pure motor strokes—Pyramidal infarction—Medullary strokes—Hemiparesis—Corticospinal tracts—Hypoglossal nerve © 2020 Elsevier Inc. All rights reserved.

### Introduction

Medial Medullary Syndrome (Dejerine Syndrome) which constitute less than 1% of vertebrobasilar strokes.<sup>1,2</sup> has been well described in the literature. However isolated medullary pyramidal infarcts are very rare and only 4 cases has been described in the English literature.<sup>3-6</sup> These infarcts can present with pure motor hemiparesis which can be missed on CT scan. Here we present two cases of pure motor strokes caused by infarction of the medullary pyramids and highlight the importance of MRI in picking up these rare strokes.

#### Case 1

A 58 year old male presented with acute mild right hemiparesis since the last 5 days. His initial symptoms at the onset of weakness were acute transient dizziness and

Corresponding author. E-mail: amal.m.alhashmi@gmail.com. 1052-3057/\$ - see front matter © 2020 Elsevier Inc. All rights reserved. https://doi.org/10.1016/j.jstrokecerebrovasdis.2020.105163 vomiting which was followed by heaviness of his tongue and having "a different feeling" on the right half of his body. These symptoms lasted only for the first few hours while the hemiparesis persisted.

He was a chronic smoker and poorly controlled diabetic On examination.

The cranial nerves including the facial muscles were normal. He had a pyramidal arm drift on the right side with increased tone (pronator catch and adductor spasm) with reduced dexterity in the fingers and toes. The deep tendon reflexes were exaggerated on the right side with extensor plantars. The sensory examination was normal for touch pain and temperature, vibration and joint position sense. The tactile direction discrimination was impaired in the right lower limb. There were no cerebellar signs.

The CT Scan was normal. The MRI Showed diffusion restriction confined to the left medullary pyramid (Fig. 1 A, B C) The MR angiogram showed nonvisualized Left vertebral artery.

His Signs and symptoms gradually improved and were asymptomatic by the 3<sup>rd</sup> week.

## Case 2

A 65 year old lady presented with 2 day history of right lower limb paresthesias followed by R hemiparesis. She also felt heaviness of tongue at the onset of her symptoms which resolved in 4-6 h. She is a known Hypertensive and diabetic on regular treatment.

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Fig. 1. Case Number 1: showing Pyramidal infarct in (A) DWI (B) FLAIR and (C) T2W Sequences Case Number 2 showing Pyramidal infarct in (D) DWI (E) FLAIR and (F) T2W Sequences.

Examination showed flaccid weakness of right side of MRC scale power of 3/5 in upper limb and lower limb 4/5 with right extensor plantar. The cranial nerve examination including the facial muscles and the tongue movements were normal Sensations including touch, pain joint position and vibration sense were preserved. There were no cerebellar signs. The CT Scan was normal.

The MRI Showed diffusion restriction on DWI Sequences and corresponding ADC sequences confined to the left medullary pyramid with FLAIR changes. (Fig. 1: D, E, F) Chronic capsular and cerebellar infarcts were also noted. She developed mild spasticity over the next few days and subsequently her deficits improved over a period of period of 3 weeks.

## Discussion

Pure motor hemiparesis can occur due to involvement of the cortical spinal tracts in the following locations (1) pontine paramedian infarct (2) posterior limb of the internal capsule (3) Cerebral Peduncles (4) The medullary Pyramids

However if the hemiparesis spares the face one need to consider either a Pontine paramedian infarct where often the facial nuclei or nerve may be spared or medullary pyramidal strokes.

The face may be involved if there is infarction involving the pyramid in the rostral medulla as described in the Syndrome of Dejerine's Fourth Reich.<sup>7</sup> A loop of the corticobulbar tract descends at least till the mid portion of the medulla to explain for the facial weakness in such cases.

A history of dysarthria, vertigo and previous transient ischemic episode consisting of a gait abnormality will be helpful in localizing the lesion towards the pons.<sup>8</sup>

Both the cases has transient tongue heaviness at the onset of their symptoms Hypoglossal nerve exit the medulla in close proximity and lateral to the pyramids. During the acute stage of the infarct either the surrounding edema or the effect of ischemia in the deeper territory of a paramedian penetrating vessel may have caused the transient symptom by affecting the hypoglossal nerve fascicles.

Medial Lemniscus lie posterior to the pyramids. In Case 1 the tactile direction discrimination was impaired in the right lower limb. In Case 2 there was right lower limb paresthesia This can be explained since in the medial lemniscus the laminations representing the lower part of the body close to the pyramids.<sup>9</sup>



Fig. 2. The whole DWI Sequences of case number 1 (Figure 2 A) and case number 2 (Figure 2 B) showing only isolated pyramidal infarcts.

Tactile perception of direction of scratch is a sensitive clinical sign and may be helpful in posterior column dysfunction even if the vibration and joint position test are normal.<sup>10</sup>

In both our cases the initial head CT was normal and the diagnosis was confirmed by MRI. This highlights the importance of MRI for suspected cases as in other cases described.<sup>4,5</sup> (Fig. 2). The DWI sequences of case number 1 (Fig. 2A) and case number 2 (Fig. 2B) showing only isolated pyramidal infracts

The Pyramidal area of Medulla receives its blood supply mainly from branches of proximal part of the anterior Spinal Artery with some contribution from small br anches of distal vertebral Artery. In case 1 the left vertebral artery was thrombosed. Pure pyramidal strokes tend to have only mild weakness and generally recovers well.<sup>3,4</sup>

#### Take home points

- In patients with pure motor hemiparesis without facial involvement an infarct in the medullary pyramids should be considered.
- MRI is needed for confirming the diagnosis.
- In uncomplicated cases the hemiparesis is usually mild and recovery is usually good.

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