

## Clinical Image

## Hyperdense MCA Sign

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Early detection of infarction is important to plan for the management and enhance the recovery. Very few early signs on non-contrast enhanced CT scan for detection of ischemia described in literature. Despite of poor sensitivity of these signs, CT scan is primarily done to rule out intra cerebral haemorrhage and plan further with thrombolysis if patient comes in window period. Early parenchymal abnormalities, the Attenuation of Lentiform Nucleus (ALN), loss of the insular ribbon (LIR), insular ribbon sign or Hemispheric Sulcus Effacement (HSE) occur less frequently and they are positive criteria for infarction in progress [1]. One more significant sign is hyperdense artery sign which reflects the presence of acute intra luminal thrombus which is a surrogate of arterial obstruction. HMCAS is seen in thromboembolic MCA occlusion resulting in vessel attenuation value increase from 40HU (flowing blood) to 80HU (thrombus) [2]. Leys et al identified that hyperdense middle cerebral artery sign has a specificity of 100% but sensitivity is only 30% [3] (Figure 1-2).

Here we are describing a case which showed hyperdense artery sign in left middle cerebral artery in early CT scan of a stroke patient without any other parenchymal changes. A 67 year female with diabetes, hypertension, diagnosed with triple vessel disease with 80% blockade in Left Anterior Descending (LAD), 80% blockade in left circumflex (LCX) and total occlusion of obtuse marginal1 (OM1) artery. Carotid Doppler has shown fibro calcific plaques blocking 15-20% of bilateral carotid arteries and left ventricular function was good. She underwent uneventful coronary artery bypass grafting with 3 appropriate grafts. Early postoperative course was uneventful, started on antiplatelets, anticoagulants, statins, and supportive care and shifted out of ICU on POD2. On 5<sup>th</sup> postoperative day, she developed sudden onset right hemiparesis, deviation of mouth to left and drowsiness. On physical examination, patient had profound right-sided neglect and conjugate deviation of the eyes to the left side. Motor examination showed grade 0 power on right upper and lower extremities, 3+ reflexes on the right and 2+ reflexes on the left with positive babinski on the right side. She was intubated, shifted to emergency CT brain to rule out acute cerebro vascular accident. CT showed a linear hyperdense structure extending from left ICA bifurcation into left sylvian fissure, suggestive of hyperdense left MCA (HU 69) could be secondary to acute thrombus. Rest of brain

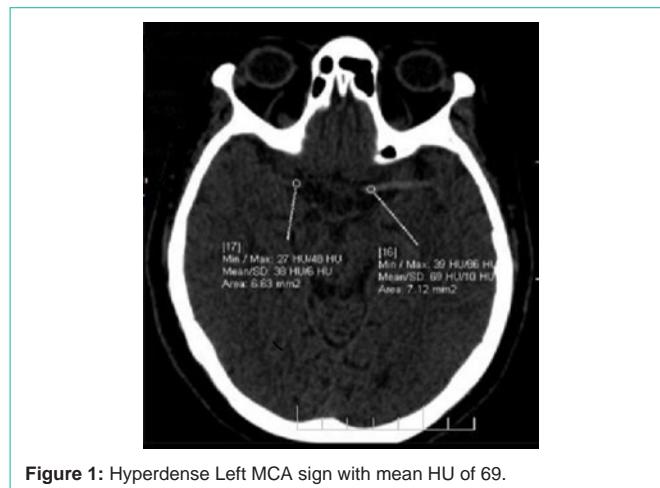


Figure 1: Hyperdense Left MCA sign with mean HU of 69.

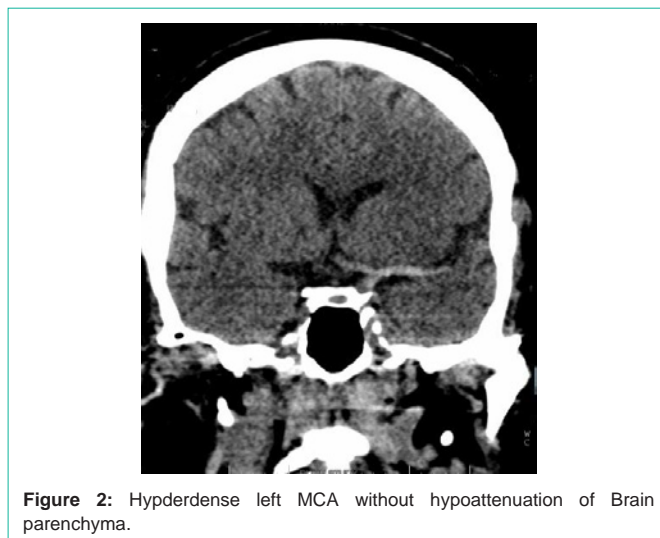


Figure 2: Hyperdense left MCA without hypodensity of Brain parenchyma.

parenchyma looked grossly normal. We could not do any further neuroradiological intervention due to financial constraints. This image is to specify that hyperdense MCA sign is one of the earliest visible signs which could be identified on CT scan in appropriate clinical situation. 24 hours follow up CT brain showed hypodensity in left MCA and ACA territory suggestive of acute infarct with subfalcine mid line shift of 9mm to right side. Patient was continued on treatment but had stormy course in ICU, developed multiorgan dysfunction syndrome and died after 4 days of ictus.

## Learning Points

1. CT scan of head without contrast is commonly done to rule out acute intracranial hemorrhage. In case of large vessel acute infarction subtle signs are seen even in a non-contrast CT scan. Subtle blurring and decreased attenuation of grey white junction due to edema is the most common early finding and as the time progresses the hypo

attenuation of parenchyma increases.

2. The increased density of middle cerebral artery (MCA) on head non-contrast CT is referred to as hyperdense MCA sign. Hyperdensity of the vessel is due to large intravascular clots and if present is the earliest sign on imaging in cases of large MCA strokes.

3. Presence of hyperdense MCA signs warns the need for early endovascular intervention with in window period as the tissue plasminogen activator is not very effective and it may land up in further complications in terms of post thrombolysis intra cranial bleed. Early

endovascular intervention has given the highest recommendation in the recently updated 2018 American Society Stroke guidelines.

## References

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