

# The Differential Arterial Flow Signal Sign: An Early Brain MRI Sign of Circulatory Arrest

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A 52-year-old male with encephalopathy for 5 days, underwent an MRI brain examination. On MRI [Figure 1], there was the loss of signal void in bilateral internal carotid arteries (ICA); however, with preserved flow void in the intracranial arteries on the T2W images. Susceptibility weighted imaging (SWI) showed accentuated susceptibility changes in the intracranial arteries with hyperintense signal in bilateral ICA. We term this sign as a “differential arterial flow signal sign.” The likely cause of hyperintense signal in the ICA in our case is slow/stagnant flow, whereas hypointense signal on T2W/SWI in the intracranial arteries represent the loss of signal due to increased cerebral oxygen extraction and deoxygenated blood representing cerebral autoregulation. The increased susceptibility effect in the intracranial

arteries has been reported earlier in a series of brain-dead patients due to hypoxia.<sup>[1]</sup>

We also observed prominent medullary and cortical veins on the SWI. This finding has been previously reported to be due to increased oxygen extraction, increased deoxyhemoglobin and/or venous stasis/dilatation after cell death. A similar finding is also seen in stroke, trauma, comatose patients, and brain death.<sup>[2]</sup> MR angiography and contrast imaging were not done in our case, and the patient was immediately shifted to emergency, where he was declared dead due to cardio-respiratory arrest.

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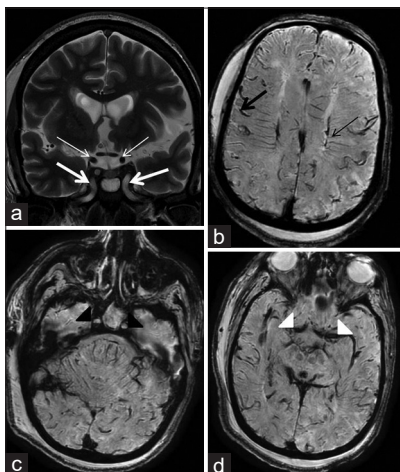
Nil.

## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

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**Figure 1:** (a) Coronal T2W image showing loss of flow void in bilateral internal carotid arteries (ICA) (thick white arrows) and presence of flow void in the intracranial vessels (thick white arrows). (b) Axial SW image shows presence of prominent cortical (thick black arrow) and medullary veins (thin black arrow). (c) Axial SW image showing hyperintense signal in bilateral ICA (black arrow head) (d) Axial SW image showing prominent susceptibility-related signal loss in intracranial arteries (white arrow heads)

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