



# CT and MR Imaging Findings in Methanol Intoxication Manifesting with BI Lateral Severe Basal Ganglia and Cerebral Involvement

CASE REPORT

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## ABSTRACT

Our case report describes a 54-year-old man who was admitted to our hospital complaining of visual impairment with gastrointestinal and neurological symptoms. Initial computed tomography examination showed bilateral symmetric putaminal and cerebral white matter hypodensities. Evaluation of the following magnetic resonance imaging, restricted diffusion in these corresponding areas were found to be compatible with cytotoxic edema.

**Teaching Point:** Diffusion-weighted imaging (DWI) plays a crucial role in the diagnosis of acute methanol intoxication.

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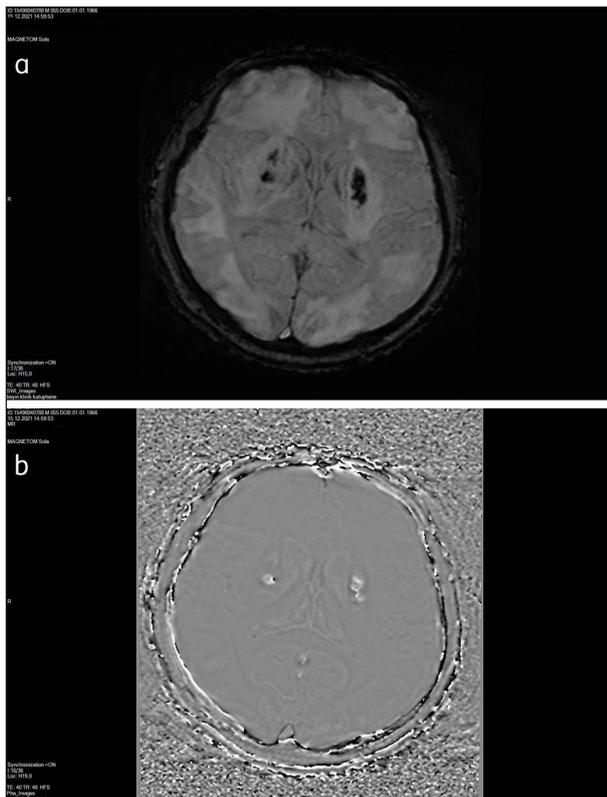
## KEYWORDS:

diffusion-weighted imaging;  
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metabolic acidosis; methanol  
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**Figure 4** **a** Magnitude SWI demonstrated hypointense hemorrhagic foci on both putaminal regions. **b** Phase-contrast SWI reveals opposite signal intensity due to positive shift effect of deoxyhemoglobin on left-handed MRI system.

The patient was transferred to the intensive care unit, where he was immediately intubated and received intravenous (IV) ethanol; sodium bicarbonate infusion and hemodialysis was performed in order to correct severe metabolic acidosis.

## DISCUSSION

In acute methanol poisoning, following a latent period of 12 to 24 hours, methanol is converted to its toxic metabolites of formic acid and formaldehyde, partly depending on the amount of the ingested dose. These metabolites cause severe toxic effects on the central nervous system (CNS), especially on the basal ganglia and optic nerves, leading to severe metabolic acidosis [3].

In the literature, there are limited number of case reports describing DWI findings of acute methanol intoxication. Deniz et al. [4] reported DWI findings of a methanol intoxication patient and showed bilateral symmetric hyperintensities in the putamen. Similarly, Ahsan [1] and Server et al. [5] demonstrated bilateral putaminal and subcortical white matter lesions with high signal intensity on DWI. Peters et al. [6] showed symmetric hypodensities in the basal ganglia on CT images and marked striatal hyperintensities on DWI,

with enhancement after gadolinium injection in an acute methanol poisoning patient. Grasso et al. [7] reported CT and DWI findings of a methanol intoxication case and described a lentiform fork sign indicating development of vasogenic edema in the bilateral external capsules, resembling a fork that borderlines putaminal necrotic regions.

Chen [8] reported an acute methanol intoxication case of a 51-year-old man who had an accidental adulterated spirit ingestion history. Atypical imaging findings were found with rapidly progressing severe subarachnoid hemorrhage and diffuse cerebral edema.

In treatment, IV ethanol administration inhibits methanol dehydrogenation, because both substances use alcohol dehydrogenase enzyme for oxidation. HCO<sub>3</sub> replacement is essential to correct metabolic acidosis and stabilizing the patient's vital parameters carries crucial importance [6].

## CONCLUSION

MRI including DWI and SWI has an important role in terms of revealing restricted diffusion and hemorrhagic foci, respectively, in the typical brain regions involved.

## COMPETING INTERESTS

The authors have no competing interests to declare.

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