

P. Hantson
Y. Kremer
J. Lerut
J.-P. Squiflet
P. Mahieu

Successful liver transplantation with a graft from a methanol-poisoned donor

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Sir: As a follow-up to our previous paper about organ donation from poisoned donors, we would like to report a new case of successful liver transplantation with a graft obtained from a methanol-poisoned donor [2].

The donor was a 34-year-old woman who was admitted to the hospital with a suspected drug overdose. The physical examination was unremarkable, and routine laboratory investigations failed to reveal any abnormality (total CO_2 28 mmol/l, anion gap 13). The patient admitted having ingested only a small amount of benzodiazepines, and the toxicological screening was consistent with this hypothesis. Ethanol was not detected. Twenty hours later, the patient became unconscious and was referred to the Intensive Care Unit. Laboratory data obtained 28 h following admission showed a severe metabolic acidosis (pH 7.05, paO_2 145 mm Hg, pCO_2 7.3 mm Hg, CO_2t 2 mmol/l, BE -29, lactate 61 mg/dl). The anion gap was 41 and the osmol gap 53 (serum osmolality 346 mosmol/kg H_2O). The toxicological analysis was completed by the determination of salicylates, ethylene-glycol, and methanol in the first blood sample drawn on admission. The methanol blood level was 3.18 g/l initially and 0.89 g/l after 34 h. The exact time of ingestion remained unknown.

The specific therapy included ethanol perfusion in order to obtain an ethanol blood level higher than 1 g/l. Hemodialysis was not available, but continuous venovenous hemofiltration was started

and 205 litres were ultrafiltrated over a 25-h period. Large amounts of sodium bicarbonate were required to control metabolic acidosis; the minimum pH was 6.69 34 h after admission. Hemodynamic conditions became unstable despite fluid therapy and catecholamine prescription (noradrenaline up to 0.35 $\mu\text{g}/\text{kg}$ per minute and dopamine up to 10 $\mu\text{g}/\text{kg}$ per minute). Transient cardiac conduction abnormalities were seen on EKG; trans-thoracic echocardiography disclosed normal cardiac contractility while the patient was still receiving moderate doses of catecholamines (noradrenaline 0.12 $\mu\text{g}/\text{kg}$ per minute, dopamine 10 $\mu\text{g}/\text{kg}$ per minute).

The diagnosis of brain death was made 64 h following hospital admission on the basis of the neurological examination and isoelectric electroencephalogram. Relevant laboratory data at this time included: urea 53 mg/dl, creatinine 1.6 mg/dl, AST 46 IU/l, ALT 28 IU/l, INR 1.3. Methanol was not detectable and metabolic acidosis had been corrected.

After some debate, it was decided that the heart was not suitable for organ transplantation because the donor had presented a sustained metabolic acidosis and also hypotensive episodes requiring catecholamine administration. We were also reminded of the fact that severe, reversible cardiac failure is a possible complication of methanol poisoning and that experimental data have demonstrated histological lesions of the myocytes in intoxicated animals [1, 3]. In our case, however, postmortem microscopic examination revealed that the heart was apparently normal. Previous experience with a successful double renal transplantation led our surgical team to consider removal of the kidneys, and the immediate outcome of both recipients was good. As for the liver, no data were available in the literature; however, severe acidosis should be considered a contraindication to the removal of this organ. An extemporaneous liver biopsy was performed that showed a normal hepatic architecture without evidence of necrosis; there were only mild signs of microvesicular steatosis. Thus, the liver was also removed and the recipient, a 56-year-old man, had an uneventful postoperative

course. The follow-up at 3 months found both kidneys and liver grafts with excellent function. Pancreas islet cells were stored in a graft bank.

This is, to our knowledge, the first case report of a liver transplantation with a graft obtained from a methanol-poisoned donor. We still believe that heart donation remains contraindicated since cardiac dysfunction is frequently observed in severe methanol poisoning, even if contractility appears normal at echocardiography. No definite criteria exist for liver donation, and each case should be discussed individually.

References

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P. Hantson (✉) · P. Mahieu
Department of Intensive Care Medicine,
Cliniques Universitaires St-Luc,
Avenue Hippocrate 10, B-1200 Brussels,
Belgium
Fax: +32 27649012

Y. Kremer
Department of Intensive Care,
Clinique Notre-Dame, Charleroi, Belgium

J. Lerut
Department of Digestive Surgery,
Cliniques Universitaires St-Luc,
Avenue Hippocrate 10, B-1200 Brussels,
Belgium

J.-P. Squiflet
Department of Renal Transplantation,
Cliniques Universitaires St-Luc,
Avenue Hippocrate 10, B-1200 Brussels,
Belgium