

# Effectiveness of High-Flux Hemodialysis for the Reduction of Serum Urea and Creatinine Levels in Life Threatening Ethylene Glycol Poisoning in Dogs - Case Report

Mircea MIRCEAN<sup>1</sup>, Răzvan CODEA<sup>2\*</sup>, Cristian POPOVICI<sup>1</sup>, Răzvan CODEA<sup>2\*</sup>, Cosmin PEȘTEAN<sup>2</sup>, Orsolya SARPATAKI<sup>3</sup>, Lucia BEL<sup>2</sup>, Liviu OANA<sup>2</sup>, Aurel BIZO<sup>4</sup>

<sup>1</sup>Department of Internal Medicine

<sup>2</sup>Department of Anesthesiology and Surgical Techniques

<sup>3</sup>Department of Pathophysiology, Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania.

<sup>4</sup>Department of Pediatric Nephrology, Emergency Children's Hospital Cluj-Napoca, Romania.

Corresponding author: [razvancodea@yahoo.com](mailto:razvancodea@yahoo.com)

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## Abstract

The main problem of ethylene glycol consumption and intoxication is acute tubular necrosis and consecutive acute renal failure. In our case a 3,5 years Bucovina Shepard female dog presented with acute renal failure following antifreeze ingestion. The dog was subjected to three HF hemodialysis treatments which dramatically reduced the urea creatinine levels and also the metabolic derangements.

**Keywords:** *dog, ethylene glycol, hemodialysis, poisoning.*

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## INTRODUCTION

Toxicosis from ingesting antifreeze is a relative common occurrence in dogs and cats. Ethylene glycol toxicosis results in the deposition of large numbers of calcium oxalate crystals in both proximal and distal tubules. Ethylene glycol intoxication is efficiently treated with hemodialysis% (Bartdges and Polzin, 2011).

Ethylene glycol intoxication is one of the most common causes of acute kidney injury and the second most common intoxication recognized in companion animals (Grauer 2009). Automobile antifreeze is the usual source of exposure, but a history of exposure to antifreeze is often denied and alternative sources of ethylene glycol exposure should be considered (Bartdges and Polzin, 2011).

Ethylene glycol intoxication is known to result in a mortality rate approaching 100%. In a report

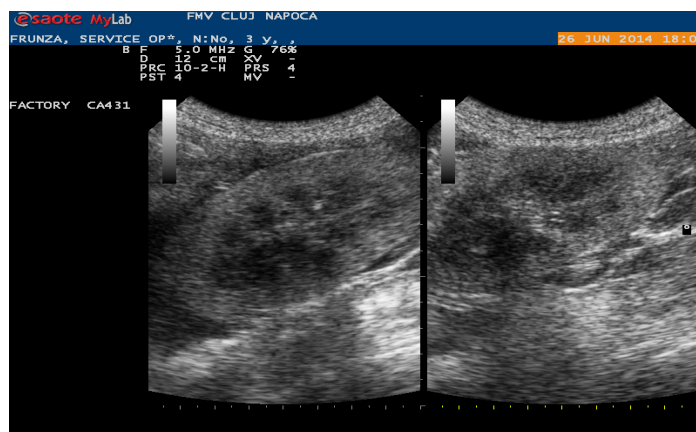
of 80 dogs with acute kidney injury of which 44% had ethylene glycol intoxication, only 20% survived to discharge. Survival rates for dogs with acute kidney injury treated with conventional therapy or dialysis show a survival rate of 0-8 % with conventional therapy, versus 12-20% rate with hemodialysis (Bartdges and Polzin, 2011).

## MATERIAL AND METHODS

A 3,5 years old Bucovina Sheppard female weighing 44,5 kg was referred to our clinic unresponsive, tachycardic, polypneic, hypothermic, hypovolemic and anuric. Blood biochemistry: UREA 347 mg/dl, CRE 12,2 mg/dl, GLU 175,5 mg/dl, Ca<sup>2+</sup> 10,4mg/dl, PHOS 7,91 mg/dl/l, K<sup>+</sup> 5,3 mmol/l, Na<sup>+</sup> 129,6 mmol/l, Mg<sup>2+</sup> 2,2 mg/dl, TP 4,68 g/dl, ALB 2,23 g/dl, GLOB 2,41g/dl, ALT 50 U/l, ALP 67 U/l, TBIL 0,4 mg/dl. Hematological



**Fig. 1.** Patient undergoing HF hemodialysis



**Fig. 2.** Renal Ultrasonographic findings

findings: severe normocytic, normochromic, non regenerative anemia: HCT 17,52%, HGB 56,00g/l. Two hours after admission, the patient was transfused with one unit of whole blood and HF hemodialysis was begun with a duration of four hours (Fig. 1). In total 3 HF hemodialysis sessions, 24 hour apart were performed. Ultrasound guided percutaneous renal biopsy revealed acute tubular necrosis with tubular nephrocalcinosis conclusive for ethylene glycol poisoning (Fig. 2). The patient was euthanized by owner's request in the fourth day.

## RESULTS

Day one, before hemodialysis - serum UREA 347 mg/dl and CRE 12,2mg/dl, after hemodialysis - serum UREA 97,5mg/dl and CRE 7,2mg/dl. Day two, before hemodialysis - serum UREA 212,4 mg/dl and CRE 9,2 mg/dl, after hemodialysis - serum UREA 72,3 mg/dl and CRE 6,7 mg/dl. Day three,

before hemodialysis - serum UREA 261,6 mg/dl and CRE 10,2 mg/dl, after hemodialysis - serum UREA 82,5 mg/dl and CRE 6,36 mg/dl.

## CONCLUSION

HF hemodialysis treatment, alone, is highly efficient in the reduction of serum urea and creatinine levels in ethylene glycol intoxicated dogs. To our knowledge this is the first report of hemodialysis in canine patients with ethylene glycol poisoning in Romania.

## REFERENCES

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