

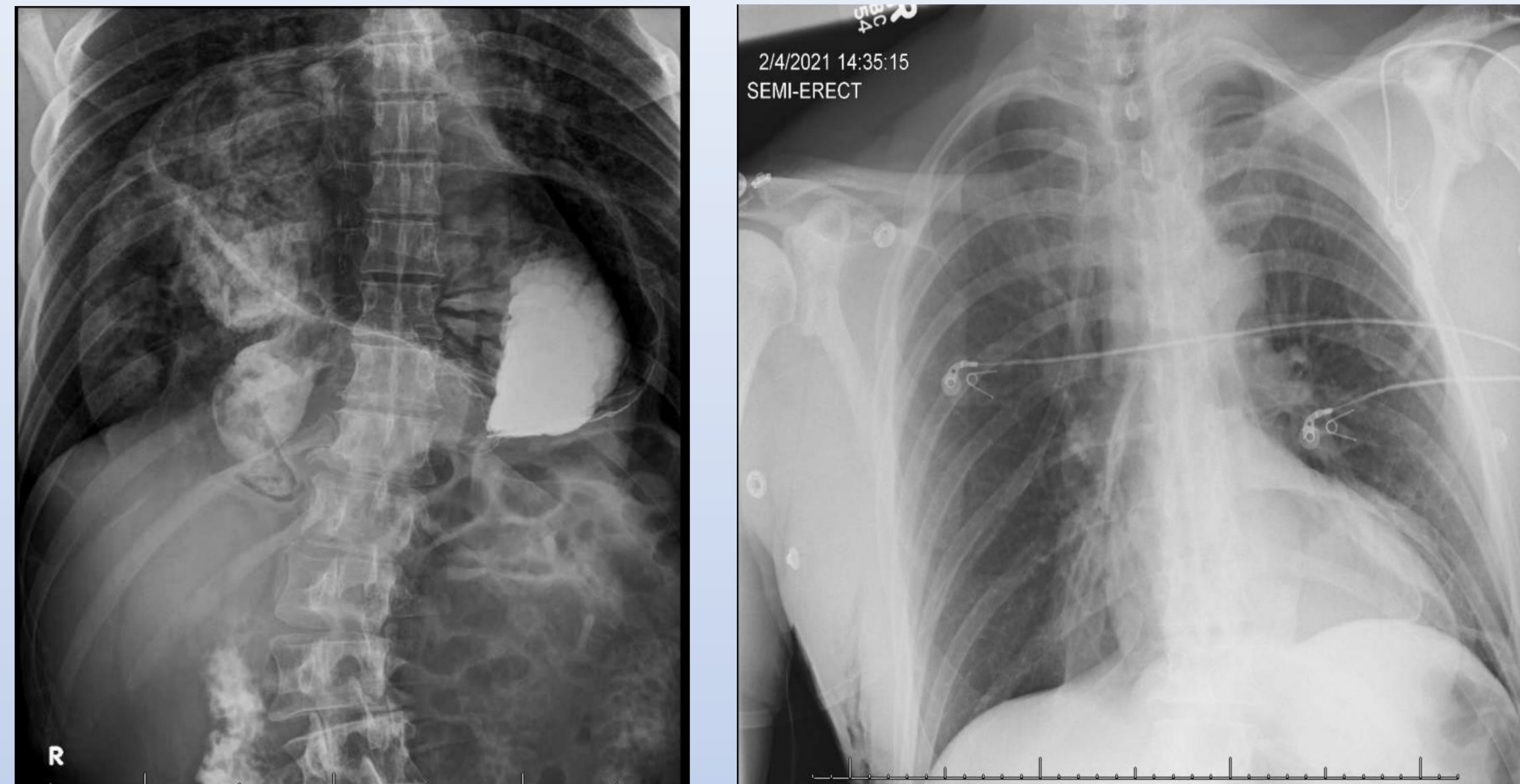
# Severe Asymptomatic Hyperkalemia Following Robot-Assisted Paraesophageal Hernia Repair

Taimoor Khan, MD<sup>1</sup>; Michael Aguad MD<sup>1</sup>; Walter Diaz MD<sup>1,2</sup>; Christopher Ayers MD<sup>1,2</sup>; Christopher Seaver MD<sup>3</sup>; Syed Razi MD<sup>3</sup>; Benjamin Houseman, MD, PhD, FASA<sup>1,2</sup>  
<sup>1</sup>Department of Anesthesiology, Memorial Healthcare System; <sup>2</sup>Division of Anesthesiology, Envision Physician Services; <sup>3</sup>Department of Surgery, Memorial Healthcare System



## INTRODUCTION

Severe hyperkalemia, defined as a serum potassium greater than 6 mmol/L, is rare in the postoperative period. Risk factors include certain medications, renal insufficiency, blood transfusion, surgery >4 hrs, morbid obesity, extensive tissue dissection, and pressure-induced rhabdomyolysis.<sup>1-3</sup> This case report describes severe hyperkalemia following robot-assisted paraesophageal hernia repair with only mild rhabdomyolysis.



Selected image from the preoperative GI esophogram (left) and postoperative chest X-ray, showing repair of the hernia (right)

## PREOPERATIVE HISTORY

- A 50-year-old male presented with a history of progressive acid reflux, bloating, and chest discomfort. Past medical history was significant for creatine and testosterone supplementation as well as anabolic steroid use, which he had stopped two months prior.
- Past surgical history was significant for robot-assisted inguinal and umbilical hernia repairs under general anesthesia with both succinylcholine and rocuronium.
- Endoscopy revealed an enlarged, tortuous esophagus with mild gastritis and a paraesophageal hernia. A Gastrointestinal esophogram showed total herniation of the stomach and portions of the small and large bowel into the chest cavity.
- Preoperative laboratory values included K 4.7 mmol/L, Bun 19 mg/dL, and creatinine 1.55 mg/dL, which was near his baseline during routine lab work over the last several years. Estimated GFR was 50, and preoperative hematocrit was 54.9%.

Location	Preop	PACU	PACU	Floor	Floor	Floor	Floor
Date	4-Feb	4-Feb	4-Feb	4-Feb	5-Feb	6-Feb	7-Feb
Time	600	1442	1601	1811	459	520	518
K	4.7	6.9	5.6	4.3	4.7	4	3.9
GFR	51	53	50		66	81	91
CPK				1255	3011	3208	1232
Cr	1.55	1.52			1.26	1.07	0.97
Hct	54.9	53.5			49.7		
Glc	106	177	176		223	124	102

Serial laboratory values during the patient's perioperative course. Treatment of hyperkalemia in PACU resulted in significant drop in serum potassium. CK values peaked on POD3, while eGFR / creatinine improved postoperatively.

## PERIOPERATIVE COURSE

- The patient was brought to the operating room and general anesthesia was induced with propofol, lidocaine, and rocuronium. The total procedure time was seven hours and eighteen minutes, and an ultrasound-guided TAP block was performed prior to extubation. Two liters of lactated ringer's solution were given intravenously, urine output was 500 mL, and estimated blood loss was 50 mL.
- A chemistry panel was conducted in the post-anesthesia care unit given the extended duration of the surgery. This panel revealed a serum potassium of 6.9 mmol/L and creatinine of 1.52 mg/dL. No arrhythmias or t-wave abnormalities were noted on telemetry. Arterial blood gas sampling showed pH 7.35, pCO<sub>2</sub> 39, base excess -4.3 and potassium 7 mmol/L.
- Hyperkalemia was treated with a standard protocol which included intravenous insulin, dextrose, and albuterol, lowering the potassium level to 5.6 mmol/L.
- Four hours after surgery, serum potassium was 4.3 mmol/L, phosphate was 3.2 mmol/L, and creatinine kinase (CK) was 1255 units. CK levels peaked at 3209 units on postoperative day (POD) 2 and declined to 1000 units on POD3, when he was discharged home. Serum creatinine decreased to 1.07 mg/dL on POD2 and 0.97 mg/dL on POD3.

## DISCUSSION

Postoperative hyperkalemia has been reported following robot-assisted urologic surgery in patients with pre-existing renal insufficiency,<sup>4</sup> but this is the first report of hyperkalemia following robotic paraesophageal hernia repair. We believe that mild preoperative renal insufficiency, prolonged operative time, and potassium release due to direct trauma, ischemia, and pressure injury each contributed to hyperkalemia. Prior anabolic steroid and testosterone use may have also increased susceptibility of myocytes to injury.<sup>5</sup> This case illustrates the value of electrolyte and telemetry monitoring in cases with potential for severe hyperkalemia. While neither telemetry nor serum potassium alone predict the clinical severity of hyperkalemia,<sup>1</sup> early detection permitted rapid treatment in this patient and likely avoided progression to an adverse event.

## REFERENCES

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