

Rhabdomyolysis: An unusual complication following endoscopic component separation hernia repair

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ABSTRACT

Separation of components technique for incisional hernia repair is increasingly utilized as a strategy for hernia repair in both the obese and those with loss of abdominal domain. Endoscopic component separation technique is increasingly performed to minimize wound complications associated with the open procedure. We present a case of a patient who developed acute renal failure related to rhabdomyolysis following ECST. A 62-year-old morbidly obese female with BMI of 46 underwent ECST hernia repair for a large midline hernia with loss of domain. Postoperatively, she was found to be oliguric with a dark brown colored urine, elevated serum creatinine and blood urea nitrogen, and increased urine myoglobin levels. She recovered with aggressive hydration and urine alkalinization. We present this unique complication and review the literature.

INTRODUCTION

The endoscopic component separation technique is an emerging technique for repair of large ventral hernias (1). The technique offers specific advantages to the open technique and to traditional ventral hernia repair. Although the technique is growing in popularity, these types of procedures represent a minority of overall ventral hernia repairs. Rhabdomyolysis is an infrequent post-surgical complication with significant morbidity and improved outcomes with early detection and treatment. To our knowledge, rhabdomyolysis has not been previously reported following component separation hernia repairs.

As in most types of acute kidney injury, the mechanism of injury with rhabdomyolysis occurs not in the glomerulus but in the renal tubules, thus urine output is an insensitive early predictor of injury. Although myoglobin is not harmful to the renal system, its metabolite, ferrihemate, is toxic. The conversion of myoglobin to ferrihemate occurs in the presence of urine acidity with a pH below 5.5. Knowledge of the mechanism has guided the treatment of rhabdomyolysis with forced diuresis and urine alkalinization. The incidence of rhabdomyolysis following bariatric surgery has been reported as high as 22% when defined by strict creatine phosphokinase (CPK) levels (2). This report describes a major post-operative complication following an emerging laparoscopic technique.

CASE REPORT

A 62-year-old morbidly obese (BMI 46) female underwent ventral hernia repair utilizing ECST for a large ventral hernia with loss of domain. Her hernia developed secondary to a laparotomy for vertical body gastroplasty complicated by postoperative wound infection. The patient underwent uneventful hernia repair with closure of the midline and placement of a reinforcing mesh with an operative duration of approximately three hours.

The patient became oliguric on the first postoperative day with dark brown colored urine. Evaluation demonstrated increased creatine kinase, serum creatinine, blood urea nitrogen, as well as urine myoglobin levels. The patient was diagnosed with acute tubular necrosis secondary to rhabdomyolysis and treatment was immediately initiated with administration of fluid and alkalinization of the urine with sodium bicarbonate. Further discussion with the patient revealed a recent fall with injuries to both her upper extremity and shoulder. Radiographs confirmed scaphoid, metacarpal, and scapula fractures. Her postoperative course was further complicated by hyperkalemia, atrial fibrillation, and hospital-acquired pneumonia. The patient was discharged on post-operative day 12 without the need for dialysis in normal sinus rhythm.

DISCUSSION

ECST is an emerging technique allowing for a vascularized muscle flap to be mobilized to aid in the repair of large ventral hernias (3). The technique is most commonly utilized in patients with challenging hernia repairs associated with obesity, large defects, and loss of domain (1). Although rhabdomyolysis has been described in the bariatric and laparoscopic literature (4,5), this complication has not been reported following component separation hernia repairs. This patient is similarly obese to those undergoing bariatric surgical procedures, but hernia repair patients may be at increased risk of rhabdomyolysis independent of their weight and may develop this complication at shorter operative times and with decreased patient weight due to the extensive skeletal muscle dissection required. Rhabdomyolysis has also been reported in the urologic literature although this group of patients frequently experiences prolonged operative times and has a propensity for renal dysfunction and bias towards existing renal dysfunction (6,7). Risk factors most commonly associated with rhabdomyolysis include prolonged operative time, morbid obesity, renal insufficiency, and diabetes (4,8).

The presence of preoperative trauma in this patient presents an additional risk factor for rhabdomyolysis. The presence of a scapular fracture represents trauma requiring substantial force, likely with associated substantial soft tissue damage and myoglobin release. This most certainly contributed to the patient's complication. Lying in the supine position for an extended period of time may have exacerbated tissue damage. Although this patient was not forthcoming in revealing her recent fall preoperatively, it is likely that her rhabdomyolysis was related to her recent surgery as she was not experiencing oliguria prior to her operation.

Preventative strategies may be employed for those felt to be at high risk for rhabdomyolysis. Frequent turns in the operating room has been discussed but is mainly associated with cases where gluteal compartment syndrome was involved or where flank position was primary (6,7,9). Avoiding certain anesthetic agents, most notably propofol, may also serve to reduce the risk (2,4). Prophylactic alkalinization of the urine has no proven benefit in prophylaxis against

rhabdomyolysis (10). Appropriate perioperative hydration may be helpful but is already commonly performed amongst surgical patients. There is no role for serum or urine screening tests in patients without oliguria.

Rhabdomyolysis is an infrequent complication following surgical procedures. A high index of suspicion is required in patients developing postoperative oliguria in order to promptly diagnose this condition and initiate treatment. The extensive muscular dissection associated with component separation hernia repair may contribute to the development of rhabdomyolysis.

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