

## Rhabdomyolysis Associated With Brazilian Butt Lift: A Case Report

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### ABSTRACT

This case highlights and discusses the clinical evaluation and the importance of recognizing one of the many complications of Brazilian Butt Lift (BBL), specifically postoperative Rhabdomyolysis. Maintaining a high index of suspicion of Rhabdomyolysis in association with BBL procedure as an uncommon etiology of comorbidities is crucial. Furthermore highlighting the utility of various laboratory tests, clinical hospital courses, and the multidisciplinary team approach between internists and plastic surgeons are displayed.

**Keywords:** Brazilian Butt Lift; Rhabdomyolysis

### INTRODUCTION

Buttock augmentation surgeries are rapidly evolving. It is reported that 94% of buttock augmentation procedures are autologous fat-filled buttock augmentation, and only 6% are implants. The Brazilian Butt Lift (BBL) has become the most popular plastic surgery procedure for buttock shaping and augmentations.<sup>[1]</sup> Unfortunately, BBL is associated with the highest mortality rate compared to other aesthetic surgical procedures, and South Florida carries the highest BBL mortality by far in the nation.<sup>[2]</sup> While deep venous thrombosis and pulmonary fat embolism are the main risks, other potential risks exist, like rhabdomyolysis.

Postoperative Rhabdomyolysis following liposuction has been reported in a few cases.<sup>[3,4]</sup> However, a gap in the literature exists for such complications after BBL. Postsurgical rhabdomyolysis results from skeletal muscle injury and the release of muscle cell constituents into the plasma. Electrolyte disturbances, acute kidney failure, elevation of muscle enzymes, and heme positive urine analysis with minimal or absent red blood cells are characteristic of rhabdomyolysis.<sup>[5]</sup> Imaging generally plays little role in the initial diagnosis of rhabdomyolysis. However, computed

tomography (CT) of the head may be necessary if the patient presents with altered sensorium. Prompt recognition and diagnosis of rhabdomyolysis and its complications are crucial to initiating management.

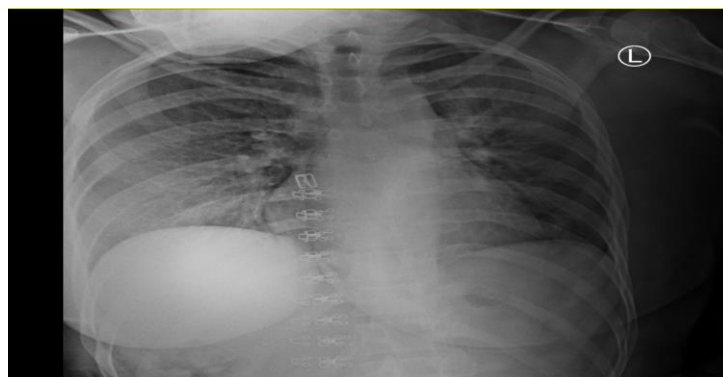
We here discuss the clinical evaluation of a 31-year-old female presenting with multiple episodes of vomiting and altered sensorium 1 day after BBL. BBL was complicated by acute rhabdomyolysis. The patient's symptoms improved during hospital admission, and labs, including creatinine kinase and liver enzymes, and kidney function gradually returned to reference ranges. The patient presented in this case report *gave* informed consent and is aware that there are no patient-identifying details in the text or images submitted.

## CASE DESCRIPTION

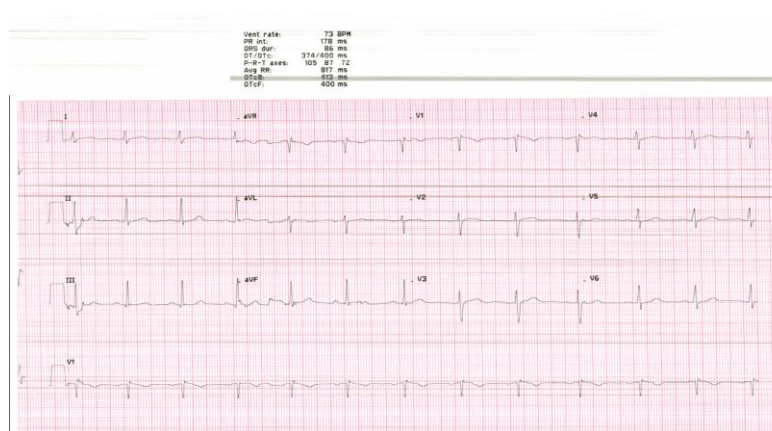
A 31-year-old African American female with a past medical history of a sickle cell trait and a BBL 1 day ago presented to the emergency department with multiple episodes of vomiting and an altered sensorium to respond to full history evaluation but was oriented to the person. According to the next of kin, the patient was alert, awake, and oriented three times in the recovery room after the BBL. She received one dose of hydrocodone (325 mg), one dose of ciprofloxacin (400 mg), and one dose of ondansetron, and her symptoms started after receiving those medications following BBL. The patient's next of kin According to the next of kin, the patient denied chest pain, palpitation, fever, night sweats, shortness of breath, orthopnea, paroxysmal nocturnal, dyspnea, or any gastroenterology or urinary symptoms. Her family history was unremarkable, and she is not on any medications at home. At the time of the evaluation, the physical exam revealed that the patient had a BM of 32.1 Kg/m<sup>2</sup>, alert and oriented to time, person, and place, and had unremarkable vital signs (blood pressure of 115/75 mmHg, a heart rate of 100 beats per minute, a 97.6 F temperature, a respiratory rate of 20/minute, and the patient was saturating 99% on room air). The patient had an equal bilateral breathing sound without any wheezes or rhonchi. Cardiac and abdominal examinations were unremarkable. The extremity examination was unremarkable, with intact sensations, pulses felt peripherally, and no muscle weakness. The Torso and abdominal surgical sites were covered with a dressing that was dry. A chest x-ray (Figure 1) showed a normal cardiac silhouette with no focal pulmonary consolidation or pleural effusion. An electrocardiogram (EKG) demonstrated normal sinus rhythm (Figure 2). Computerized tomography of the brain without a contrast agent showed no evidence of acute intracranial hemorrhage, midline shift, or mass effect. Given the history and the blood workup, the development of post-BBL rhabdomyolysis was suspected and confirmed with the laboratory workup as follows:

Total serum creatine phosphokinase (CK) was 36335 U/L (reference range 30–35 U/L), serum LDH level was 859 U/L (reference range 120–246 U/L), elevation of serum ALT was 78 U/L (reference range 0–35 U/L), and AST levels were 164 U/L (reference range 15–46 U/L) despite normal bilirubin levels. The COVID-19 test was negative. The urine drug toxicology screen was Negative. Serum potassium, sodium, calcium, magnesium, and phosphorus were all within normal limits. Other laboratory workup revealed a white cell count of  $12.2 \times 10^3/\mu\text{L}$ ; hemoglobin 7.3 g/dL; hemocrit 36.3; MCV 85; platelets  $284 \times 10^3/\mu\text{L}$  (normal range  $130\text{--}360 \times 10^3/\mu\text{L}$ ); urea 23 mg/dL (normal range 15–45 mg/dL); creatinine 0.64 mg/dL (normal range 0.6–1.1 mg/dL); BUN/creatinine ratio 23; sodium 136 mmol/L (normal range 135–145 mmol/L); potassium 3.6 mmol/L (normal range 3.5–5.0 mmol/L). The

coagulation profile, cardiac troponin-I, high-sensitivity CRP, lactic acid, and procalcitonin were within normal limits. Arterial blood gases on admission showed pH 7.44, pCO<sub>2</sub> 32, pO<sub>2</sub> 74, and HCO<sub>3</sub> 21.3. Aldolase was expectedly elevated at 73.2 (reference range: 1.0 to 7.5 units per liter (U/L). TSH was normal at 2.27 uIU/mL (reference range: 0.46–4.6 uIU/mL). Urine Analysis showed evidence of urinary myoglobin excretion (small blood but negative for RBC). The confirmed diagnosis of postoperative Rhabdomyolysis was reached, and the patient was admitted for further management and monitoring. Intravenous hydration with normal sodium chloride was initiated immediately and maintained (total given of 400–7000 ml) in order to decrease the nephrotoxicity of myoglobin. The patient's symptoms improved during hospital admission, and labs gradually returned to reference ranges. Lab levels of CK trended downward as follows: 36335 > 19751 > 9602 > 8000 > 5900 > 1600, as well as ALT, which trended downward 78 > 75 > 74 > 61, and AST, which trended downward 164 > 134 > 132 > 119. The D dimer was mildly elevated at 2.24. Hence, ultrasound of the bilateral extremities showed no evidence of acute deep venous thrombosis in the visualized bilateral upper or lower extremity veins. With the resolution of symptoms on postoperative day #2, improvement of the patient's clinical condition, and trending of the labs downward, the patient was offered educational and counseling about an appropriate lifestyle and the importance of hydration. She was discharged home and was advised to follow up with her plastic surgeon within one week.



**Figure 1:** Chest X-ray: showing no acute cardiopulmonary process.



**Figure 2:** ECG showing normal sinus rhythm.

## DISCUSSION

We here present a case of postoperative rhabdomyolysis in a young female who presented mainly with altered mental status, elevated CK levels, and Liver enzymes one day post-BBL procedure. Risk factors for Rhabdomyolysis in general include young age, males, a sedentary lifestyle, heat exposure along with strenuous exercise, and post-surgical. Hence, awareness among internists and hospitalists is crucial to being familiar with early recognition and management strategies.<sup>[5]</sup>

Rhabdomyolysis has also been reported in patients undergoing surgical procedures in whom pressure necrosis of muscle occurs from positioning. The severity of postoperative Rhabdomyolysis ranges from asymptomatic elevations of muscle enzyme levels in the serum to life-threatening cases associated with extreme electrolyte imbalances, compartment syndrome, and acute renal and liver failure.<sup>[5]</sup> Our patient was a typical case presenting with post-surgical Rhabdomyolysis and meeting the diagnostic criteria of elevated CK more than 5 times the upper limit of normal and a positive urine test for blood (myoglobin) but lacking red blood cells under microscopic analysis. While acute kidney injury (AKI) results from the nephrotoxic effect of myoglobin released from muscle breakdown, which causes renal vasoconstrictions and tubular obstruction, that was not the case in our patient. While cases of Rhabdomyolysis have been reported after liposuction,<sup>[3]</sup> *there is a lack of literature on the specific occurrence of Rhabdomyolysis post-BBL procedure.* The possible etiologies for this rhabdomyolysis include either malignant hyperthermia associated with anesthetics or compression of the musculature and resultant ischemia. The latter being most likely given the abrupt nature and timing of the postoperative BB: rhabdomyolysis.

BBL surgery is one of the fastest-growing procedures in aesthetic surgery.<sup>[6]</sup> Gluteal fat grafting techniques in their initial phases included "intramuscular fat grafting," which permitted a large volume of fat transfers to be injected into a well-perfused muscular site, theoretically resulting in a higher percentage survival of the grafted fat.<sup>[1]</sup> However, the danger of gluteal fat grafting (specifically intramuscular fat grafting) was recognized in 2015, when the experience of plastic surgeons in Mexico and Columbia was reviewed, identifying a major cause of mortality from fat pulmonary emboli.<sup>[6,7-8]</sup> Later in 2019, the Florida Board of Medicine (FLBOM) raised the awareness of the high mortality rate of BBL surgery in the state, and accordingly, the practice was changed to include the standard of care for gluteal fat grafting as a "subcutaneous-only injection" technique (above the deep 14 gluteal fascia).<sup>[2]</sup>

The mainstay treatment for Rhabdomyolysis in general is cessation of physical activity, rest, aggressive fluid hydration, and, in some cases, forced alkalization of the urine. Hospitalization time varies depending on the severity of the condition and the recovery of the organ injury (Liver or kidney).<sup>[5]</sup> Fortunately, our patient did not have an acute kidney injury.

In conclusion, we have demonstrated in this case the unique occurrence of postoperative rhabdomyolysis after the BBL procedure. Early diagnosis and treatment are the cornerstones for the successful management of this serious complication. Patient education and counseling about the procedure are crucial.

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