Case report

Gluteal Compartment Syndrome following bariatric surgery: A rare but important complication

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HIGHLIGHTS

- Gluteal Compartment Syndrome is a rare occurrence but can have disastrous consequences to the patient.
- Little is known about this syndrome and is either unreported or undiagnosed.
- This article creates awareness of a rare syndrome.
- May be increasingly seen in clinical practice as the popularity of bariatric surgery is gaining momentum.
- It offers a mini systematic review of handful of previously reported studies and suggests management and preventative measures.

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Abstract

Gluteal Compartment Syndrome is a rare condition caused by excessive pressure within the gluteal compartments which leads to a number of potentially serious sequelae including rhabdomyolysis, nerve damage, renal failure and death. As bariatric patients are heavy and during prolonged bariatric procedures lie in one position for extended periods of time, they are especially susceptible to developing this complication. It is therefore essential that bariatric surgeons are aware of this complication and how to minimise the chances of it occurring and how to diagnose it. We describe a case of Gluteal Compartment Syndrome in a patient following a gastric bypass and review the aetiology, pathophysiology, treatment and prevention of this complication.

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1. Introduction

Gluteal Compartment Syndrome is a rare complication of surgery caused by prolonged pressure over the buttock area, most commonly caused by a prolonged period on an operating table. It presents with pain in the buttock as well as weakness, paraesthesia and numbness in the leg. This commonly goes unrecognised being misdiagnosed simply as an effect of pressure that will resolve without treatment. It can lead to renal failure, sepsis, long term neurological sequelae in the affected limb and even death. As bariatric surgery procedures can be prolonged this complication can arise. With bariatric surgery increasingly gaining popularity it is worthwhile to create awareness of this potentially fatal syndrome.

We describe a case of Gluteal Compartment Syndrome following bariatric surgery. As it is rare we decided to revisit the aetiology, pathophysiology and prevention of this complication.

1.1. Presentation of case

A 52 yr old male with a BMI of 69.9 kg/m², excess body weight (EBW) of 147 kg and ideal body weight (IBW) of 79.2 kg, underwent laparoscopic Roux-en-Y gastric bypass. It took two hours to anaesthetise the patient and the operation time was five hours as both were technically difficult. Immediately upon waking, the patient complained of severe pain in the right buttock, numbness and weakness in the right leg. Examination showed buttock swelling and decreased sensation in the distribution of the sciatic nerve. The Gluteal compartment pressure was 65 mmHg (normal 14 mmHg), serum Creatinine of 190 and serum Creatinine Kinase (CK) 44459 iu/l (normal 39–308 iu/l). The urine was reddish brown in colour due to the methaemoglobulinaemia that ensued. He was taken to theatre the
same day for fasciotomy to the Gluteal compartment and debridement of dead muscle. Two further debridements were performed on separate occasions. Acute kidney injury was treated by maintaining a good urinary output and alkalinising the urine with bicarbonate. The wound was allowed to heal by secondary intention. The patient made a good recovery and was discharged home after 35 days and does not currently have any residual deficit.

2. Discussion

The Gluteal region consists of a large muscle mass covered by a strong osseofascial layer which can potentially give rise to a compartment syndrome. The gluteal muscles are divided into two layers, superficial and deep. The superficial layer consists of 3 components: Gluteus maximus, Gluteus medius/minimus and tensor fascia lata. These three sets of muscle are each enveloped in non distensible fasciae which confine them to a limited space. This restriction of space cannot accommodate any increase in interstitial pressure in the gluteal osseofascial compartment [1]. Factors such as long surgical procedures, improper operative positioning, spontaneous Superior Gluteal artery rupture, sickle cell induced infarct, prolonged immobility associated with alcohol and substance abuse can cause oedema and haemorrhage leading to a rise in the interstitial pressure thus compromising the circulation causing ischaemia and necrosis of the muscles and nerves [2].

A PubMed search using the term “Gluteal Compartment Syndrome and bariatric surgery” produced eighty nine articles three of which were associated with bariatric surgery. The three publications indicate it’s occurrence in bariatric patients [3-5] undergoing prolonged surgery and are compared with the current case in a tabulated form below (Table 1) as a systematic review so far.

This condition can present in a variety of ways. Symptoms include painful movement of the hip, bruising, tense swelling of the buttocks, altered sensation, paraesthesia and palsy within the territory of the sciatic nerve. Clinical signs such as increased gluteal compartmental pressure to at least >30 mmHg (n = 14 mmHg), Myoglobinuria (tea coloured urine) resulting in acute renal failure, third space fluid losses, causing hypotension, hyperkalaemia causing acidosis and multi organ failure may be present [6]. Gluteal Compartment Syndrome is often associated with Rhabdomyolysis which is a serious syndrome due to direct or indirect muscle injury. The muscle necrosis can cause extreme rise in serum creatine kinase levels, acute renal failure and disseminated intravascular coagulation. As demonstrated in the Table 1 most patients including our own, rhabdomyolysis was present and treated accordingly with intravenous fluids and alkalinisation of the urine to help prevent the precipitation of myoglobin in the renal tubules [8]. The diagnosis of Gluteal comp syndrome is a clinical one but measuring Creatinine Kinase concentrations, the intra-compartmental pressure and MRI features help to confirm the diagnosis. The latter may demonstrate muscle oedema. In order to avoid permanent nerve and muscular damage, early diagnosis is of paramount importance. Fasciotomy should be carried out as soon as possible to release the pressure and all necrotic muscle excised. Renal failure, which may accompany this condition as a result of rhabdomyolysis, should be treated with forced diuresis and alkalinisation of the urine. Haemodialysis may be required in severe cases. Hyperbaric oxygen is of little proven benefit.

The case reported here is comparable to the 6 patients in the Bostanjian et al. series. We were quick to recognise the syndrome and carry out the surgical and medical treatment accordingly.

3. Conclusion

Various recommendations have been made for the prevention of this syndrome: Adequate intraoperative padding and positioning, limiting the duration of surgery, decubitus positioning every 2 h per-operatively, and avoiding operating on super obese high risk patients early in the learning curve or consider a shorter operation such as sleeve gastrectomy as the definitive procedure or a two stage procedure where a sleeve gastrectomy followed by a Gastric bypass. Other options would include weight loss pre-operatively using measures such as a strict low calorie diet, an intra-gastric balloon, Endobarrier or POSE procedure. Post operative measures such as systematic neuromuscular examination looking for signs of compartment syndrome and routine checking of CKP levels will help in early identification [5,6,7]. Although very few cases of Gluteal Compartment Syndrome in bariatric surgery have been documented, it is set to be an emerging complication and therefore it is prudent to be aware of this entity as the popularity of bariatric surgery increases.

Ethical approval

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Author contribution

Miss Bernadette Pereira—data collection, analysis, writing.
Mr Dugal Heath — Study Design, review.

Conflicts of interest

The authors Miss Bernadette Pereira and Mr Dugal heath declare that there are no conflicts of interest.

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