

## CASE REPORT

## Unicompartment compartment syndrome following laparoscopic colonic resection

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Dr Asli Kalin,  
asli.kalin@gmail.com**SUMMARY**

We report the case of a 43-year-old man who developed anterior compartment syndrome following laparoscopic colorectal surgery in the lithotomy position. This was initially masked by postoperative epidural usage and ultimately diagnosed 2 days postoperatively. The patient underwent decompression by four compartment fasciotomy and two follow-up re-explorations of the affected lower limb. This case is unique for two reasons: only the anterior compartment of the lower limb was affected—which is rare in itself—and there was a delay in presentation secondary to postoperative epidural usage.

**BACKGROUND**

Laparoscopic colorectal surgery is associated with a lower postoperative complication rate of 15–20% and shorter postoperative inpatient stay of 6–11 days when compared with open surgery.<sup>1</sup> Despite its clear advantages, the relative operating times remain longer for laparoscopic surgery. This promotes a host of new associated complications which include acute lower limb compartment syndrome.

Compartment syndrome occurs when there is an increase in pressure within an osseofascial compartment compromising muscular blood flow. It is associated with significant morbidity and loss of limb function resulting from necrosis of ischaemic muscle in the affected compartment as well as potential mortality from the oxidant-driven reperfusion injury that occurs after surgical decompression, hence making it a vital complication to recognise and treat promptly through decompressive fasciotomy.

Although its incidence remains unknown, compartment syndrome associated with laparoscopic surgery has been described in the literature both in the context of colorectal as well as urological and gynaecological procedures.<sup>2</sup>

We describe a case of compartment syndrome complicating laparoscopic colorectal surgery in our own unit which is unique for two reasons: only the anterior compartment of the lower limb was affected—which is rare in itself—and there was a delay in presentation secondary to postoperative epidural usage.

**CASE PRESENTATION**

A 43-year-old man with a medical history of well-controlled epilepsy underwent an elective sigmoid colectomy and bladder repair for a colovesical fistula secondary to diverticular disease. The

operation was performed with the patient in the standard lithotomy position and lasted 5 h. After mobilisation of the left colon the operation was converted to an open procedure due to inability to proceed with the dissection of the fistula. We performed a sigmoid colectomy and a primary hand sewn anastomosis with 3-0 polydioxanone sulfate. The 2 cm hole in the bladder wall at the site of the fistula was over sewn with 2-0 interrupted vicryl. The total blood loss recorded during the operation was 760 mL. A urinary catheter was left in situ to remain for 2 weeks. The operation was successful with no intraoperative complications. The patient went to intensive treatment unit with a morphine epidural patient-controlled analgesia (PCA) in situ for postoperative pain control.

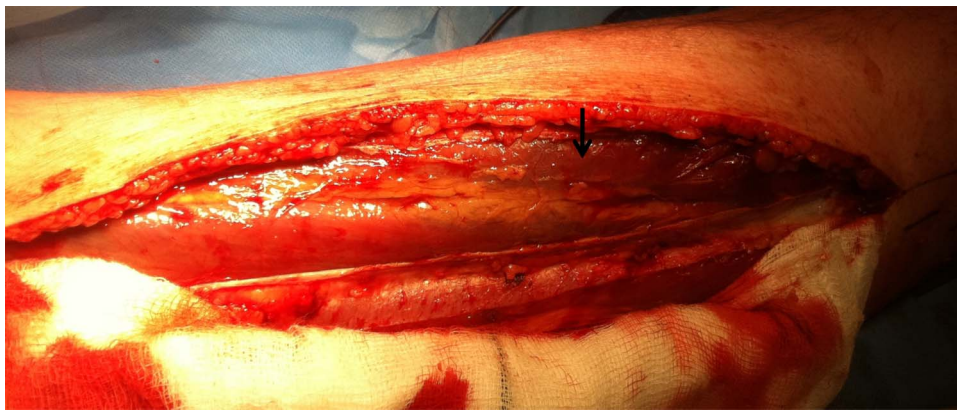
On day 2 postoperatively, the patient reported loss of sensation over the left S1 dermatome. This was initially thought to be due to a neuropraxia secondary to perioperative compression or a possible side effect of the epidural. The 'acute pain team' reviewed the patient in the afternoon and recorded that the patient was reporting of '*increasing pain in the left foot radiating to the left knee*'. The plan was made to continue with the PCA morphine.

The patient was reviewed by the surgical team the same afternoon. He was reporting of very severe pain in the left lower leg which was worsening. On examination, the left lower leg looked erythematous and swollen with severe tenderness on palpation of the anterior compartment and worse on passive dorsiflexion of the ankle. Posterior tibialis and dorsalis pedis pulses were present in both legs. Bloods taken earlier that morning showed creatine kinase levels to be markedly elevated at 8000 IU/L (60–400 IU/L). The patient was also reviewed urgently by the orthopaedic team who confirmed the clinical diagnosis of acute compartment syndrome. The patient was then booked for immediate lower limb fasciotomies.

**TREATMENT**

Following a standard two incision technique, all four lower limb compartments were decompressed. We found the anterior compartment (tibialis anterior) muscle bulging and dusky with no reaction to electrocautery (figure 1). The remaining three lower leg compartments looked healthy with no signs of ischaemia. Once decompressed the incisions were left open for 48 h after which the left leg was re-explored. In the interval, a Doppler ultrasound scan ruled out a deep vein thrombosis

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**Figure 1** Initial fasciotomy: tibialis anterior muscle (arrow) looks ischaemic and non-viable compared with the surrounding muscles.

or other anatomical abnormalities as contributing factors to the clinical presentation.

#### OUTCOME AND FOLLOW-UP

Re-exploration after 48 h confirmed the tibialis anterior, extensor hallucis longus and extensor digitorum communis muscles to be non-salvagable. The deep peroneal nerve appeared intact and continuous. The necrosed muscles were debrided, leaving the tibia exposed antero-laterally. The medial compartment wound was closed. The lateral wound was partially closed with four tension sutures and packed.

Two days later, the left leg was re-explored a second time. No further necrotic tissue was identified and the patient was subsequently transferred to a tertiary plastic surgical unit for skin grafting.

Of note the patient made a very good recovery from the original bowel surgery and had returned to normal bowel function 3 days postoperatively. He eventually made a good functional recovery from his fasciotomies and is making good progress with intensive physiotherapy.

#### DISCUSSION

Compartment syndrome is a condition which, if undetected, will cause considerable morbidity and mortality. Commonly seen by emergency room and orthopaedic trauma teams in association with long bone fractures, it is not regularly seen on a general surgery ward. Knowledge that compartment syndrome may occur following procedures with the patient in a lithotomy position for a prolonged time period and an understanding of the presenting symptoms and signs should aid the surgical team in early detection and treatment of this condition. Delayed diagnosis of compartment syndrome has occasionally been linked with the usage of epidural analgesia, but a review of these cases shows that analgesic demands and pain are still high.<sup>3</sup> The delay is not due to the PCA but more to the fact that the diagnosis is not considered. Risk factors associated with the development of compartment syndrome following colorectal surgery include the lithotomy position and surgery lasting more than 4 h.<sup>4</sup>

This case is unique in that only the tibialis anterior muscle was affected. No mechanism was clearly demonstrated to have

caused this; however, the fact that this was a unicompartamental process is notable. We hope that highlighting this case and discussing the potential pitfalls of epidural PCA will increase awareness of this condition. In summary, any patient with increasing and abnormal/unexpected pain following laparoscopic surgery and higher usage of analgesia than expected should trigger a review by doctors to rule out compartment syndrome.

#### Learning points

- ▶ Compartment syndrome is a potential complication of laparoscopic abdominal surgery.
- ▶ Use of postoperative analgesia such as epidurals can mask the initial pain associated with compartment syndrome.
- ▶ Any patient with unexpected pain and increasing use of postoperative analgesia following laparoscopic surgery should trigger a review to rule out compartment syndrome.

**Contributors** All the authors were involved in the management of the patient and the writing and reviewing of the manuscript.

**Competing interests** None.

**Patient consent** Obtained.

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