

Chapter 101

Case on Abdominal Compartment Syndrome

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The compartment syndrome (CS) is defined as an increase in the pressure inside the abdominal cavity over 12 mmHg. Already known in the nineteenth century, its treatment remains controversial. Recent increasing interest is due to the improvement in surgical techniques over abdominal closure, the availability of damage control surgery, and support measures, leading to a decrease in the associated mortality of CS—even though it still is high in critically ill patients.

Patient

We present a 12-month-old male baby with medical reports as follows: liver transplant, 5 days before complication, due to acute liver failure because of a paracetamol overdose. This young baby had undergone an administration of rectal paracetamol because of high fever and then was reported to the emergency department having general discomfort, high fever up to 40 °C, and progressively low reactivity. The only information available was the administration of an unknown dosage of paracetamol by his parents in a high fever context.

At the time of the admission, the patient looked ill, having an encephalopathic appearance. The test showed signs of liver failure, high levels of transaminases, and an INR up to 9 after receiving vitamin K. The patient was admitted to the Intensive Unit Care (IUC) in order to have support therapy applied while awaiting a liver

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transplant. After a 36-h stay, a compatible adult donor appeared and then a split-liver transplant was carried out using the left lateral segments (II–III).

Surgery

The problem after the transplant was performed became the impossibility of closing the abdominal wall due to the edema, the bowel dilatation, and a slightly larger liver than appropriate (Fig. 101.1). Obviously, the intra-abdominal pressure (IAP) had not been measured because it was not considered necessary to know that it could become very high. Then a Bogota technique (Fig. 101.2) was performed, attaching the bag to the fascia with a running PDS 2/0 suture. This technique was performed temporarily in order to avoid a compartment abdominal syndrome, to recover the

Fig. 101.1 Large size of the liver and bowel dilatation

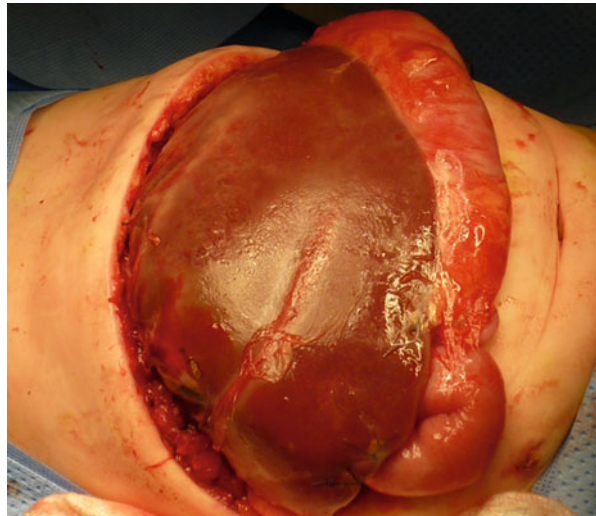


Fig. 101.2 Bogota bag attached to the fascia



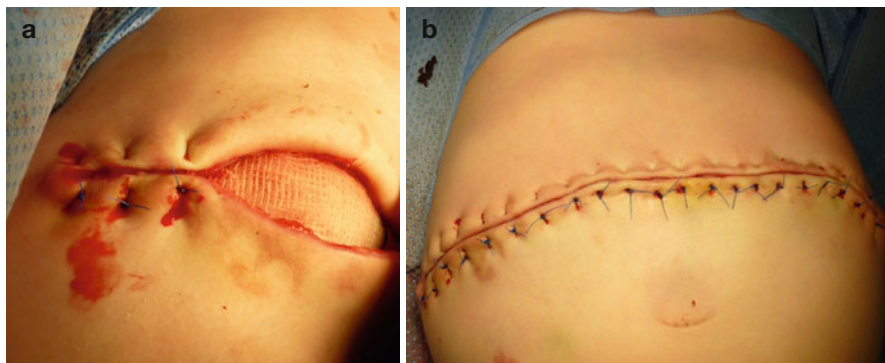


Fig. 101.3 (a) Skin closure with interrupted suture. (b) Final appearance

patient as fast as possible, and then after few days, to remove the bag and to possibly close the abdominal wall.

Postoperative Course

After 5 days, the patient looked well and a second operation was performed; the film was removed, the fascia was cleaned, and an attempt at closure was done, but unfortunately that failed. The primary closure of the fascia was impossible and only interrupted PDS 2/0 skin stitches were done (Fig. 101.3a). From then on, the postoperative evolution of the patient at the hospital became satisfactory, with a good function of the liver and without complications in the abdominal closure. The patient having a good appearance, an appropriate growth, and not having signs of wound healing complications could after a stay of 24 days be discharged from the IUC. The first postoperative days went satisfactory, the IAP (daily measures) progressively decreased, and there were no problems during his stay. Hence, the patient was discharged from the hospital doing well. After a period of 3 months, the patient underwent a new surgical procedure and the fascia of the muscle was closed tension free by means of interrupted 2/0 Vicryl® stitches and ensuring that there was no intra-abdominal hypertension (IAH) (Fig. 101.3b).

Discussion

The compartment syndrome (CS) is a situation in which the intra-abdominal pressure (IAP) arises to high levels as measured by a urinary catheter inside the bladder and is associated with organ dysfunction and mortality in critically ill patients.

In 1984, Krol et al. published the first series of measurements of the IAP and its definitions. At the first Congress on Abdominal Compartment Syndrome in 2004, several definitions were established and a new age for treating this disease opened.

Now intra-abdominal hypertension (IAH) is defined as IAP > 12 mmHg (or 16 cm H₂O), but there are several grades of IAH attending to the abdominal pressure (grades I–IV) and the quickness of its process (acute, subacute, chronic). The CS can be caused by many situations, both surgical and nonsurgical, for example, bowel obstruction, gastric dilatation, pancreatitis, pneumoperitoneum in laparoscopic approach, ascites, hemoperitoneum, etc.

In such cases several problems may appear, such as ventilator failure, low renal perfusion, and splanchnic congestion. In order to avoid this problem, it is crucial to measure the abdominal pressure, apply support measures, and to carry out a surgical procedure to decrease the high pressure inside the abdominal cavity. In summary, an IAP higher than 20 mmHg and a failure of the life support treatment will form an indication for engaging surgical decompression [1].

Reference

1. Schein M, Wittmann DH, Aprahamian C, Condon RE. The abdominal compartment syndrome. The physiological and clinical consequences of elevated intra-abdominal pressure. *J Am Coll Surg.* 1995;180:745–53.