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**Entrapment of the small bowel due to improper closure of the parietal peritoneum: a rare cause of re-laparotomy after caesarean section**

**Abstract:** The most frequent surgical intervention in obstetric practice is a caesarean section, which is associated with several short- and long-term complications. Re-laparotomy after caesarean section is one of the most distressing of these complications and the reported incidence is 0.12–0.70%. The most common indications for re-laparotomy after caesarean section are bleeding, uterine atony, evagination and haematoma in the muscles. Herein, we report a case of entrapment of the small bowel caused by improper closure of the parietal peritoneum after a caesarean section that required re-laparotomy. Closure of the parietal peritoneum is recommended to avoid future development of adhesions, however, stitch intervals should be properly adjusted to prevent incarceration of the small bowel. We recommend closure of the peritoneum after caesarean section, however, stitch intervals should be kept at no more than 1.5 cm to avoid entrapment of the small bowel.

**Keywords:** Bowel entrapment; caesarean section; re-laparotomy.

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**Introduction**

The most frequent surgical intervention in obstetric practice is caesarean section which is associated with several short- and long-term complications. Re-laparotomy after caesarean section is one of the most distressing of these complications and the reported incidence is 0.12–0.70% [8, 10]. The most common indications for re-laparotomy after caesarean section are bleeding, uterine atony, evagination and haematoma in the muscles [10].

Early post-operative small bowel obstruction is a common complication of abdominal surgery and usually resolves with nasogastric decompression and medical therapy [5]. Herein, we report a case of entrapment of the small bowel caused by improper closure of the parietal peritoneum after caesarean section, which required re-laparotomy. To the best of our knowledge; this is the first case of acute abdomen resulting from entrapment of small bowel between the stitches of the parietal peritoneum because of improper surgical technique. Closure of the parietal peritoneum is recommended to avoid future development of adhesions, however, stitch intervals should be properly adjusted to prevent incarceration of the small bowel.

**Case report**

A 28-year-old patient who had her third caesarean section 6 days previously was admitted to the emergency ward with the complaints of nausea, vomiting and severe abdominal pain. She had an uneventful pregnancy and her medical history was normal and an elective caesarean delivery was performed because of previous sections. Delivery was completed without any complications and the mother was discharged with her baby on the third post-operative day.

On the initial examination; the patient was hypotensive and there was rebound tenderness of the abdomen. Her blood pressure was 70/40 mm Hg, pulse: 98/min and she had a body temperature of 37°C. Bowel sounds were hypoactive. Blood samples for laboratory tests were obtained and intravenous fluids were administered. Complete blood count and blood chemistry were within normal boundaries. Ultrasound examination revealed a heterogeneous cystic mass about 3–4 cm beneath the incision, however, we could not differentiate between haematoma, abscess or bowel loops. To identify the nature of that mass we performed an ultrasound-guided fine needle aspiration. Ultrasound guided fine needle aspiration yielded intestinal content, and an emergency re-laparotomy with the suspicion of fascial dehiscence and bowel strangulation was performed.

When skin and subcutaneous sutures were removed, we were very much surprised to see that the fascial sutures
were intact. Upon opening the fascia, a 10-cm segment of the ileum was found to be entrapped between the opening of the parietal peritoneal sutures (Figure 1). The peritoneum was closed with 00 polyglactin running stitches. Stitch intervals were observed to be more than 2 cm wide, which led to entrapment of the bowel (Figure 2). When we removed the sutures, the colour of the incarcerated bowel returned to normal and the motility and circulation was restored as evident by the mesenteric pulse. The parietal peritoneum was resutured with running sutures and smaller stitch intervals and the abdomen was closed.

The patient passed flatus at 6 h post-operative and was discharged on the fourth post-operative day with complete resolution of her complaints.

**Discussion**

Caesarean section is most frequently performed surgical procedure in obstetric practice and the incidence is increasing worldwide [7]. There are many possible ways of performing a caesarean section and surgical techniques vary considerably. Traditionally, closure of the peritoneum was done with the aim of restoring the normal anatomy and decreasing the risk of infection, wound dehiscence, bleeding and adhesion formation.

Duration of surgery, immediate post-operative and short-term effects such as the amount of narcotic doses required, fever or wound infection were found to be unaffected by the closure or non-closure of the peritoneum [1, 4]. However, data regarding the adhesion formation are more inconsistent. In our instution, we close the parietal peritoneum during caesarean section in an effort to prevent adhesions and other aforementioned complications. Although the Cochrane meta analysis review recommended non-closure of the peritoneum, a recent meta analysis suggested that this is associated with more adhesion formation compared to closure [2, 3]. The discrepancy between the results of the meta analysis might be caused...
by the differences in surgical technique or the suture material.

In a recent study, Kapustian et al. [6] reported comparable adhesion formation with closure or non-closure of the peritoneum in patients undergoing primary caesarean section. Conversely, Lyell et al. [9] reported that closure of the rectus muscles at caesarean delivery might reduce adhesions, and visceral peritoneum closure may increase them. They recommended the assessment of surgical techniques independently as they might have opposite effects on formation of adhesions.

There is no well-defined standard technique for the closure of the parietal peritoneum. In the present case, a serious complication requiring re-laparotomy after caesarean section occurred because the sutures employed for the closure of the parietal peritoneum were too far apart.

Re-laparotomy after caesarean section is a rare event, frustrating both the patient and the surgeon. The reported incidence of re-laparotomy after caesarean section is 0.12–0.70% [8, 10]. The most frequent indications are bleeding, uterine atony, haematomas and pelvic abscesses.

We conducted a literature search using Pubmed, Scopus and Google Scholar covering the last 20 years and could not find a similar case. This is the first report about re-laparotomy after caesarean section caused by entrapment of bowel in the gap between the stitches in parietal peritoneum.

In conclusion; we recommend closure of the peritoneum after caesarean section with running 00 polyglactin sutures. However, utmost importance must be paid to the surgical technique and the stitch intervals should be kept at no more than 1.5 cm to avoid entrapment of the small bowel. We do not necessarily recommend the reappraisal of the recti muscles, provided that the parietal peritoneum is closed.

The authors declare that they complied with the World Medical Association declaration of Helsinki. The publication of the case was approved by the institutional review board and the informed consent of the patient was obtained.

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