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Case Report

Cecal volvulus following laparoscopic cholecystectomy: A case report and literature review ☆,☆☆

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ABSTRACT

Laparoscopic cholecystectomy has become the gold standard for the treatment of symptomatic gallbladder stones. Minimally invasive operations are currently preferred by surgeons and patients. Intestinal volvulus after laparoscopic cholecystectomy has been reported before, but it is still a rare complication of laparoscopic procedures, i.e., including laparoscopic cholecystectomy. To date, few cases were found specifically mentioning cecal volvulus after laparoscopic cholecystectomy; other articles had mentioned other intestinal volvulus after other laparoscopic procedures. We are reporting a case of cecal volvulus that developed in a 43-year-old woman 2 days after laparoscopic cholecystectomy, which was treated successfully with exploratory laparotomy with limited right hemicolectomy and ileocolic primary anastomosis. More studies have to be made to determine the incidence and causative relation between laparoscopic surgeries and volvulus, and volvulus should be considered in every patient who complains of postoperative abdominal pain and symptoms of intestinal obstruction.

Introduction

Laparoscopic cholecystectomy has been the best way to treat symptomatic gallbladder stones and other harmless gallbladder diseases for a long time because it is less invasive, gives better cosmetic results, lessens pain after surgery, shortens hospital stay, and allows for better evaluation of the abdomen during surgery [1].

With all these advantages, the risk of bile duct injuries has been increased with laparoscopic cholecystectomy and possibly other injuries to other structures, e.g., bowel or

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vessels [1]. Cecal volvulus is the rotation of the cecum around its mesentery with resultant obstruction, necrosis, and perforation. The term volvulus is derived from the Latin word volvere ("to twist"). A colonic volvulus occurs when a part of the colon twists on its mesentery, resulting in acute, subacute, or chronic colonic obstruction. One of the main types of colonic volvulus is cecal volvulus. This rarely occurs soon after laparoscopic cholecystectomy [2]. Even though cecal volvulus post laparoscopic cholecystectomy is still a rare complication, as in this 43-year-old female who developed this complication after 2 days of laparoscopic cholecystectomy.

Case presentation

A 43-year-old female patient, who has a free medical history, a surgical history of a caesarean section in 2009, and a history of bilateral fallopian tube ligation in 2018, came to our hospital for the first time. She complained of right upper quadrant pain one day prior to the visit, which was accompanied by nausea and vomiting 2 times. The pain was continuous and radiating to her right shoulder, and it was different from the previous attacks, which were less painful and of less duration and were not associated with vomiting. An abdominal ultrasound was done during her treatment course in the emergency room, and she was found to have an over-distended gallbladder with multiple stones, the largest 2.7 cm in the neck of the gallbladder, associated with wall thickening and pericholecystic edema. These findings were consistent with acute calculous cholecystitis, without biliary dilatation, along with normal caliber of the common bile duct; otherwise, the abdominal ultrasound was unremarkable. Her laboratory investigations also were normal.

On the following day, the hospital admitted the patient and prepared her for a laparoscopic cholecystectomy. The ward received the patient postoperatively, and her recovery proceeded smoothly until her discharge home. Two days after her discharge, the patient went to the emergency room with complaints of lower abdominal pain. Initially colicky in nature, the pain gradually increased in severity, remained unradiated, and was associated with nausea but not vomiting. She also did not have a fever. Upon examination, we discovered that she had abdominal distension, tympanic to percussion, primarily in the left upper quadrant, along with diffuse tenderness. Fig. 1A and B is an X-ray of the patient's abdomen, taken both standing up and lying down. The X-ray reveals dilated bowel loops with multiple air-fluid levels, as well as large bowel loops with significant dilation. We performed a complete blood count, which revealed a leukocyte count with a left shift of neutrophils and an elevated CRP. We kept the patient NPO, administered intravenous fluid boluses, inserted a nasogastric tube, and then admitted the patient to the hospital. We performed a CT scan of the abdomen and pelvis using intravenous contrast, as depicted in Fig. 2. The scan showed cecal volvulus and a small amount of free fluid, but other than that, it was normal. The patient had cecal volvulus, with closed-loop obstruction, and no signs of perforation or strangulation, so we immediately prepared

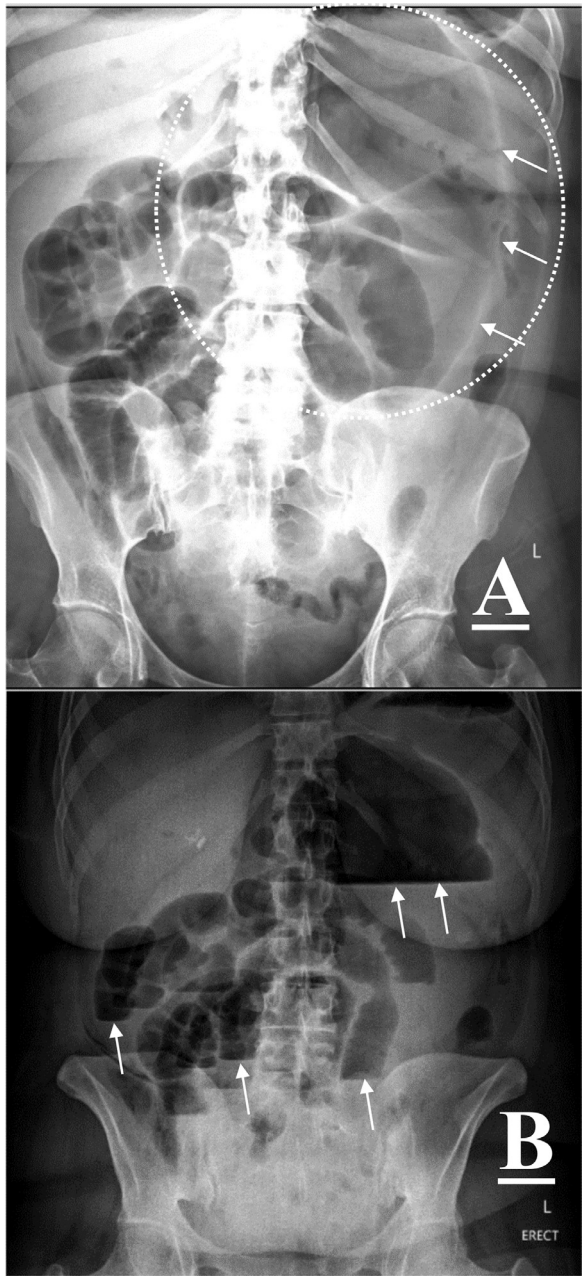

Fig. 1 – (A) demonstrates supine abdominal X-ray; the white arrows point to the edges of the dilated cecum anchored by the dotted white circle. (B) demonstrates erect abdominal X-ray, the white arrows show multiple air fluid levels in the small and large bowel loops.

him for an urgent laparotomy. The plan was to perform resection of the cecum and end-to-end primary anastomosis (ileo-colic).

The patient underwent a transfer to the surgical ICU for postoperation observation using an NGT, a Foley catheter, and an abdominal drain. was kept on IV antibiotics, with a functioning pulmonary toilet, and was noticed to recover gradually till NGT was removed and she was advanced in diet, and the

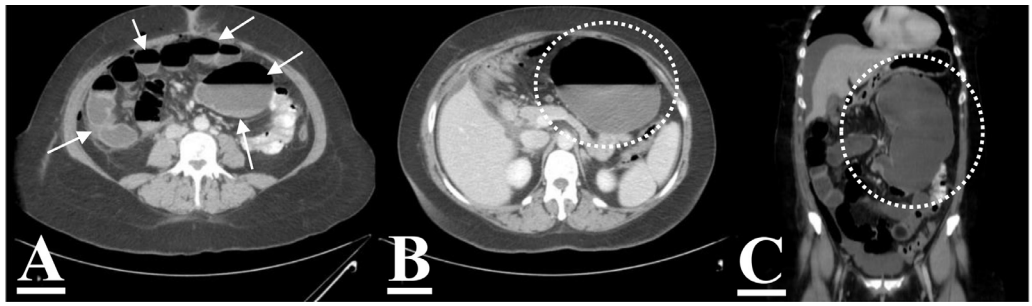

Fig. 2 – (A) shows an axial view of the abdomen and pelvis CT scan which was done for investigating the intestinal obstruction that occurred post lap cholecystectomy. The white arrows show dilated large and small bowel loops. (B) is an axial view of the abdomen and pelvis CT scan. The white dotted circle shows dilated large bowel loop (cecum). (C) is a coronal view of the abdomen and pelvis CT scan. The white dotted circle shows dilated large bowel loop (cecum) with dilated small bowel loops due to cecal volvulus.

biovac drain was removed, and she was ready to be discharged home on a soft diet.

Discussion

This article reported a case of cecal volvulus within 2 days of laparoscopic cholecystectomy. When the cecum turns around its mesentery, this is called cecal volvulus. This can cause obstructions, ischemia, and even perforation and peritonitis [1]. Cecal volvulus can occur due to different etiologies, including a mobile cecum, restriction of bowel at a fixed point (e.g., adhesion), chronic constipation, high-fiber diet, previous abdominal surgeries, presence of a gravid uterus, or a large pelvic mass. Cecal volvulus can be organoaxial (true cecal volvulus) or mesentericoaxial (cecal bascule). Organoaxial cecal volvulus involves the distal ileum and ascending colon, as they twist on each other; this differs from sigmoid volvulus in that it is in a clockwise direction. On the other hand, the cecal bascule rarely causes vascular compromise, as there is no torsion of the ileocolic mesentery [2]. Cecal bascule is rare, in which the inferior pole of the cecum folds on a horizontal axis anterior-superiorly toward the ascending colon, and it is an unusual variant of volvulus, and its diagnosis is challenging [3]. Cecal volvulus is considered the second most common site of large-bowel torsion (15 %), with the sigmoid volvulus being the most common. Because cecal volvulus is an infrequent complication after operations, no guidelines have been issued to check the abdominal cavity at the end of each surgery [1]. When reviewing the literature, it seems that very few cases are reported to have cecal volvulus after laparoscopic cholecystectomy. So, this case could be a unique added case that could help figure out the clinical conditions related to cecal volvulus.

In our case, cecal volvulus was developed 36-48 h after the surgery (laparoscopic cholecystectomy), and the patient's age was 43 years. She was operated on with an open laparotomy and a limited right hemicolectomy. There were 5 other cases where cecal volvulus developed following a laparoscopic cholecystectomy. These cases were seen during the literature review and had the following characteristics:

In a study by Bariol et al., a 74-year-old woman who had an open appendectomy and a hysterectomy before a laparoscopic cholecystectomy developed cecal volvulus 36 h after surgery and needed a right hemicolectomy to fix the problem [4].

According to Morris et al., a 71-year-old woman who had a cholecystectomy 15 years ago developed cecal volvulus 15 years later, which was likely caused by adhesions and gallstones that had been spilled. The patient was treated with an ileocolectomy [5]. Yoshiaki Mizuguchi et al. reported on a 54-year-old woman who had an appendectomy before having a laparoscopic cholecystectomy. She developed cecal volvulus after 24 h and underwent decompression colonoscopy for treatment [1].

Duron JJ et al. published a study that looked back at a case of a patient who had a laparoscopic cholecystectomy and then developed volvulus within 72 h of the surgery. They thought this might have been because of an unnoticed malrotation and treated the patient with a laparotomy [6]. The patient in Ferguson Louis et al. was a 67-year-old man who had IHD and had been through cardiac bypass surgery before. He also had chronic kidney disease, high blood pressure, and peripheral vascular disease. He had been through transurethral resection of the prostate and laparoscopic cholecystectomy while the patient was in the Trendelenburg position because he developed hypotension and desaturation during the operation. He developed a cecal bascule, a type of cecal volvulus, within 36 h of surgery and underwent a right hemicolectomy for treatment [7].

Cecal volvulus, according to the literature review, occurred within 24-48 h post laparoscopic cholecystectomy, except in the case of the one who developed cecal volvulus due to spilled gallstones and adhesion 15 years postsurgery. During the recovery from the surgery, the cecal volvulus is most likely developed and progressed due to peristalsis of the colon recovered after the small intestine [1].

One of the theories is that the nonrecovered cecum became dilated due to air and content that come from the small intes-

tine, which recovers earlier in the postoperation course; this results in subsequent cecal volvulus due to dilation [2].

There were 6 cases of cecal volvulus after laparoscopic cholecystectomy. The average age was 62 years old, with a range of 43 to 74 years old. Out of those 6, 4 were female patients (the gender of the patient presented by Duron JJ et al. is unknown, and the gender of the patient presented by Ferguson Louis et al. is male).

Yoshiaki Mizuguchi et al. treated all patients with open surgery and laparotomy, with the exception of the case they presented [1]. Decompression colonoscopy could be less invasive and take much less time, but one should keep in mind that it has a high recurrence rate, especially in cases of cecal volvulus [2]. As we already said, cecal volvulus and even intestinal volvulus, as well as intestinal obstruction, have been seen after laparoscopic surgeries (mostly laparoscopic cholecystectomy, appendectomy, and transperitoneal hernia repair). This is because of more surgeries using laparoscopy, patient positioning for the surgery, tilting of the operating table, moving the bowel during surgery, and pneumoperitoneum [1].

Intestinal obstruction in general should remain a differential diagnosis during evaluation of abdominal pain or deterioration of a patient post laparoscopic surgeries. We highly recommend an abdominal CT scan to detect cecal volvulus, as an X-ray may miss signs of this condition. The CT scans found or approved the diagnoses in reported cases.

Conclusion

Although minimally invasive surgeries, including laparoscopic surgeries such as laparoscopic cholecystectomy, have many advantages, they lead to an increased incidence of complications, e.g., bile duct injuries, and they could increase the risk of another complication, e.g., intestinal obstruction after the laparoscopic surgery, as what occurred in our case with cecal volvulus after laparoscopic cholecystectomy. Further studies and reports are necessary to determine whether laparoscopic surgery increases the incidence of such complications or not.

Ethics approval

Al Makased Hospital does not require ethical approval for reporting individual cases or case series.

Patient consent

Written informed consent was obtained from the patient for their anonymized information to be published in this article. A copy of the approved consent according to Al Makased Hospital could be submitted to the editor-in -chief, if it's necessary.

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