Case report
Unusual ascites post laparoscopic cholecystectomy in old patient: Case report and review of the literature
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ABSTRACT
Introduction: Ascites that precede laparoscopic cholecystectomy is an infrequent event. Its actual mechanism is not identified, but an inflammatory or allergic peritoneal reaction has been proposed. It can a life-threatening or an acute serious condition; for instance, the bile duct or other visceral injuries are eliminated.
Case presentation: We present a 83 years old, medically free, who presented with fever and right upper quadrant pain. Diagnosed with severe acute calculus cholecystitis. Diagnostic laparoscopy and laparoscopic cholecystectomy were done, with copious irrigation of the abdomen. Postoperatively, patient started to had tense with moderate tenderness abdomen. Drain output showed clear ascites fluid. Postoperative ascites culture returned back as negative. Ascites treated conservatively with fluid restriction and furosemide. As per our knowledge, this is the fourth case that was reported in the literature of medicine.
Discussion: This was a particular case related to ascites which emerged without any known cause. The medical history of a powerful allergic background is can be the reason for transudative ascites that take place following an uneventful, occasional laparoscopic cholecystectomy. There was a presumed abnormal peritoneal or allergic reaction to the diathermy. No specific aetiological aspect was known irrespective of an extensive search being carried out.
Conclusion: In cases of idiopathic post-laparoscopic ascites, general care and support is needed and fluid restriction and possible diuretic might be needed with no need for surgical intervention. Further studies are recommended for understanding of the pathophysiology of the disease.

1. Introduction
Our patient had a particular condition of postoperative ascites, that cropped up following an eventful laparoscopic cholecystectomy. The concentration of intra-abdominal fluid following the surgery of laparoscopic instantly raised the suspicion on particular complexity as the prime cause. It might have been chyle, enteric, bilious, and urine defending on the injured organ [1]. There are high possibilities of the patient developing bacterial or pancreatic ascites in conditions associated with postoperative infection or pancreatitis. The fluid nature and imaging dismissed enteric or biliary injury in such a condition. Acute pancreatic ascites was also dismissed out of the lipase and amylase levels, which were standard. Bacterial ascites were also ruled out since it often results in a massive collection of a bad smell accompanied by fever symptoms. Besides, our patient postoperative peritoneal cultures was negative for bacterial growth [1]. A comprehensive search carried out to establish the same cases in the history of medicine showed that only a few post-laparoscopy ascites were of an unidentified trace.

The work has been reported in line with the SCARE criteria [2].

2. Case presentation
83 years old, female, medically free, who presented with on and off fever, decrease oral intake and right upper quadrant pain. Associated with nausea and vomiting. Her symptoms started about 1 month and deteriorated about 6 days prior to the presentation. On examination she had diffuse tenderness with palpable gallbladder and positive Murphy’s sign. Radiologically confirmed the picture of perforated gallbladder. So, diagnosis of severe acute calculus cholecystitis with sepsis and acute kidney injury secondary to dehydration. Her blood works on admission, WBC (k/ul) 10.1 (normal value 4.0–11.0), Hgb (g/dl) 11.2 (normal value 12.0–16.0), Platelet (k/ul) 199 (normal value 140–450), Total

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bilirubin (mg/dl) 0.8 (normal value 0.2–1.2), Direct bilirubin (mg/dl) 0.4 (normal value 0.1–0.5), Albumin (g/dl) 3.3 (normal value 3.2–5.2), BUN (mg/dl) 39 (normal value 8.4–21), Creatinine (mg/dl) 3.39 (normal value 0.6–1.3), Na (mEq/L) 130 (normal value 136–146), K (mEq/L) 6.2 (normal value 3.5–5.1), CRP (mg/dl) 31.47 (normal value 0.10–0.5), ESR (mg/dl) 87 (normal value 0–20), Lactic acid (mmol/L) 4.87 (normal value 0.5–2.2) her urine analysis showed brown colored urine and turbid in clarity. Blood culture revealed present of Gb bac illi, E.coli which was heavy in quantity. Abdomen CT done showed distended gallbladder with multiple gallstones and suspected perforated wall as described likely represent acute calculus cholecystitis with suspicion of perforation and biloma (Fig. 1). Then, On the same day, diagnostic laparoscopy was done and showed turbid fluid- pus in pelvis and peri-cholecystic and right paracolic gutter spaces down to the pelvis, and distended Gallbladder. Fluid was collected for culture and Laparoscopic cholecystectomy was done also, with copious irrigation of the abdomen. (Figs. 2, 3) Patient tolerated the procedure, extubated in a good condition. Postoperatively at 3rd day, patient started to had tense with moderate tenderness abdomen. Drain output reaching 2450 ml, clear ascites fluid. Her normal pre-operative and post-operative bilirubin, indicated no liver impairment during her stay as the cause of ascites. Full fluid workup send with cytology, showed yellow hazy fluid, RBC 2000, WBC 1800 (<500), 65 % neutrophils and 35 % mononuclear, Fluid protein 2.9, fluid albumin 2.0, fluid triglyceride 37, fluid amalyse 16, fluid glucose 72, fluid LDH 375, peritoneal cytology was negative And mycobacterium PCR was negative intraoperative fluid culture came back as E.coli positive but the postoperative ascites culture returned back as negative.

Patient was started on Tazocin and high protein diet and ensure. Ascites treated conservatively with fluid restriction and furosemide. The patient continued peritoneal drainage, antibiotic therapy and nutritional support through feeding tube during her stay. Patient situation improved, drain with output of about 25 ml clear serous, drain removed, patient tolerate oral intake with normal bowel motion. Abdomen CT with contrast repeated at day 11th postoperatively (Figs. 4, 5) showed right lower quadrant multiloculated collection measuring 8.8 × 4.9 × 4.2 cm, seen inseparable and encasing the cecum, terminal ileum and inseparable from the right adnexa. Another collection in the pouch of douglas between the uterus and the rectum, small in size measuring 5.8 × 4.1 × 5.4 cm. Also, a collection lateral to the right adnexa and superior to the uterus was seen measuring 2.3 × 2.5 cm, and prehepatic free fluid
uneventful, occasional laparoscopic cholecystectomy. There was a pre
is can be the reason for transudative ascites that take place following an
perforation in our case).

cause can penetrate the peritoneal injury caused by some substances
related to the urinary tract or bowel, gas embolism, vessel injury, and
complication are ruled out. One can think of An inflammatory responses
applied in the laparoscopy process might have triggered an inflamma-
result of E.coli. Therefore, we contemplate that certain compounds
applied in laparoscopic surgery in areas where visceral injury has not
search on those patients. Currently, literature evidence suggests any
ability of inflammatory reaction or peritoneal allergic to agents
applied in laparoscopic surgery in areas where visceral injury has not
been spotted is restricted to reports related to isolated cases. All reports
concerning the subject have been gotten from patients who have un-
dergone a gynecological process or abdominal laparoscopic surgery.
Following a methodological search on PubMed and MEDLINE, we did
not recognize initial reports concerning the development of post-
operative idiopathic ascites after a laparoscopic appendicectomy or
related gastrointestinal surgeries. Initial reports showed the potential of
allergic reactions to chemical compounds applied in the laparoscopy
procedure. However, our patient was not given any particular drugs in
the course of the operation, and negative fluid cultures backed with
result of E.coli. Therefore, we contemplate that certain compounds
applied in the laparoscopy process might have triggered an inflamma-
tory response described by the rise of white cell numbers and the
average hypo-proteinemia of ascitic fluid.

3. Discussion

Ascites that adjacently follow laparoscopic cholecystectomy is a very
scares complication. Often, there is no distinct etiology that can be
ascertained irrespective of the meticulous work-up. The risk of portal
vein injury or liver decompensation in a patient with a known chronic
liver disease cannot be overlooked. Once other serious operative
complication are ruled out. One can think of An inflammatory responses
or allergic reactions to materials applied during this procedure – or any
other laparoscopic procedure-, such as electrocautery or CO2, like
others’ experience can be the final diagnosis in such conditions [3].
Therefore, we present an ascites case after a laparoscopic cholecystec-
tomy assumed to be brought by diffuse peritoneal irritation secondary to
peritoneal bacterial contamination from a perforated viscus (gallbladder
perforation in our case).

Increasing the application of laparoscopy over the last three decades
has increased the number of reports on negative cases associated with
this process. The most generally reported complications are injuries
related to the urinary tract or bowel, gas embolism, vessel injury, and
subcutaneous emphysema [4].

This was a particular case related to ascites which emerged without
any known cause. The medical history of a powerful allergic background
can be the reason for transudative ascites that take place following an
uneventful, occasional laparoscopic cholecystectomy. There was a pre-
sumed abnormal peritoneal or allergic reaction to the diathermy. No
specific aetiological aspect was known irrespective of an extensive
search being carried out. The application of diathermy is considered the
root cause of ascites since it was the only aspect that was not replicated
in the subsequent exploratory laparoscopy [3].

According to Alberto et al. [3], they stated that a condition of post-
laparoscopy ascites of unknown cause on 31 years of a woman and
said that the ascites were seemingly due to an abnormal peritoneal re-
action or allergic reactions within the diathermy. In a different case
following research by Freetes et al., they proposed that seemingly spe-
cific components such as heat/light, carbon dioxide, and diathermy
applied during laparoscopy surgery could have possibly triggered an
inflammatory kickback. Jiang et al. said that about eight cases associ-
ated with postoperative ascites of unidentified etiology after laparo-
scopic gynecologic surgery recommended that the ascites’ potential
cause can penetrate the peritoneal injury caused by some substances
which are applied in the operation process [4]. Such a conclusion was
reported by Zhao et al. when they stated that an idiopathic postoperative
ascites case after a laparoscopic salpingectomy [5]. In other studies done
before, assumed inflammatory methylene blue reaction was discovered
after a chromopertubation and laparoscopic procedure [6].

Post laparoscopic cholecystectomy ascites, as much as they are
scarce, is a severe issue that requires exclusion diagnosis. Original efforts
ought to be exerted to eradicate life-threatening vascular or bile duct
injury, hemorrhage or the bowel injury. Peritonitis adjacent to bowel
injury, in specific, is related to significant mortality and thus should be
sought out actively and removed in subsequent radiological imaging or
laparoscopy if possible [4]. If there is no potential injury detected during
a careful search, like in this condition, we believe that a person can
conclude that an idiopathic peritoneal reaction potentially associated
with aggressive fluid resuscitation in case of severe sepsis, bacterial
dissemination with pneumo-insufflation and prolong operative time can
cause irritation of the peritoneal surfaces. Plus, decrease venous return
from increase intra-abdominal pressure. This will cause transmitting of
the fluid from the peritoneal surfaces into the abdominal cavity.

Placing of abdominal drain intraoperative or postoperative, sending
fluid for analysis and culture, together with a regular and careful
observation is proper treatment.

Nonetheless, patients who are in a small number, no causal factor can
be recognized for the ascites development irrespective of an extensive
search on those patients. Currently, literature evidence suggests any
possibility of inflammatory reaction or peritoneal allergic to agents
applied in laparoscopic surgery in areas where visceral injury has not
been spotted is restricted to reports related to isolated cases. All reports
concerning the subject have been gotten from patients who have un-
dergone a gynecological process or abdominal laparoscopic surgery.
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result of E.coli. Therefore, we contemplate that certain compounds
applied in the laparoscopy process might have triggered an inflamma-
tory response described by the rise of white cell numbers and the
average hypo-proteinemia of ascitic fluid.

4. Conclusion

Idiopathic post-laparoscopic ascites is a benign entity that can
complicated postoperative care and prolong hospital stay with increase
in patient morbidity but no increase in mortality.

General care and support is needed and fluid restriction and possible
diuretic might be needed with no need for surgical intervention. Further
studies are recommended for understanding of the pathophysiology of
the disease.

Patient perspective

After the procedure, the surgery team ensured that the patient and
her family knew her situation and the uncommon condition that she was
in. She was assured and her family by the surgery team regarding her
situation is benign. She and her family were in continuous contact with the treating team after discharge. She and her
family were satisfied by the coordinated and optimum management.
Until drafting this paper, she and her family were contacted, and they
were satisfied with her condition.

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Ethical approval

The institution approved writing and publishing this research.

Consent

An informed written consent was obtained from the patient for publication of this case report and accompanying images.

CRediT authorship contribution statement

| Author           | Role                                      |
|------------------|-------------------------------------------|
| Othman Alfrryan  | Writing the paper, Literature review      |
| Sharifah A. Othman| Writing the paper, Data collection, Literature review |
| Norah Alabdulwahab| Writing the paper, Data collection, Literature review |
| Nasser Amer      | Writing the paper, Literature review      |
| Hanan Alghamdi   | Writing the paper, Literature review      |
| Shadi Alshammary | Writing the paper, Study concept, Literature review |

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Declaration of competing interest

The authors have no conflict of interest.

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