CLINICAL PRACTICE

Article received on January 12, 2014 and accepted for publishing on February 15 2014.

Gallbladder strangulation within a recurrent incisional hernia: An unique cause of acute cholecystitis

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Abstract: *We present a report of a unique surgical entity: acute cholecystitis caused by the gallbladder strangulation within a recurrent right upper quadrant incisional hernia. A previously healthy 39 year-old male patient presented to our Emergency Department with abdominal pain, nausea, vomiting, and a tender mass in the right upper quadrant of the abdomen, where an incisional hernia was palpable. He had a history of a gunshot wound to the right upper quadrant and multiple operations to include repairing mesh of the incisional hernia in that area. Abdominal computed tomography demonstrated an acutely inflamed gallbladder within the recurrent hernia. Open cholecystectomy and primary hernia repair were performed. Intraoperatively, the gallbladder appeared being strangled within the hernia. The patient recovered uneventfully and no cholelithiasis was observed on gross examination of the gallbladder. Though there have been a few reports of gallbladder strangulation within primary incisional hernia, ours is the first to describe this phenomenon in a recurrent hernia.*

INTRODUCTION

Neither incisional hernia nor acute cholecystitis is uncommonly encountered in surgical practice. While the presence of an abdominal wall hernia in the right upper quadrant (RUQ) might be complicated by the presence of a herniated gallbladder, strangulation of the gallbladder within an incisional hernia is an exceedingly rare cause of cholecystitis, with only a handful of cases reported in the literature. We are presenting such a case, the first reported with a recurrent incisional hernia as the cause of cholecystitis.

The presence of an incisional hernia in the RUQ might be complicated by the presence of the herniated gallbladder. This situation is facilitated by anatomic variations of the gallbladder, such as the presence of a complete gallbladder mesentery, and also by the location and the size of the abdominal wall defect.

The acute cholecystitis of a herniated gallbladder can be triggered by the presence of the stones (obstructive mechanism), or by strangulation or torsion.

CASE REPORT

A previously healthy 39 year-old male with a history of a gunshot wound to the RUQ with injury to the colon, six years prior to presentation, had undergone

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multiple abdominal operations concluding with mesh repair of midline and RUQ incisional hernia, two years prior to presentation to our Emergency Department, complaining of a 48-hour history of severe and unremitting RUQ abdominal pain, nausea, and vomiting. The patient reported no changes in his bowel habits, melena, or hematochezia.

Physical examination revealed a 5cm tender mass in the RUQ, underlying a 12cm subcostal incision through which a recurrent incisional hernia was palpable. The mass was clearly within the hernia and was irreducible. The patient reported that the mass had been present and slowly enlarging for about eighteen months. The patient's other abdominal incisions in the midline and the right lower quadrant were well-healed and without indication of hernia. Vital signs and laboratory evaluation were normal with the exception of a mild leukocytosis (11.6 x 1000/mm^3).

The abdominal CT scan demonstrated the fundus of the distended, inflamed gallbladder herniated into a 8 cm. AP / 10 cm. CC fascial defect, distended to 10 cm. long. The gallbladder wall is thickened to 4 mm. and there is hyperenhancing mucosa and extensive pericholecystic inflammation. No gallstones are seen. There was no dilatation of billiary duct. The muscles of the abdominal wall are atrophied, and the right incisional hernia has been previously closed with mesh. An injury of the caecum or the ascending colon was presumed as a result of previous abdominal gunshot wound. A previous diverting ileostomy was closed, but the loop of terminal ileum remains adhered to the right abdominal wall.

Into OR, a right subcostal incision was performed through the previous incision. The gallbladder fundus wall, edematous and under tension, was exposed in the subcutaneous fat, under the previously placed prosthetic mesh. The hernia defect was exposed under the mesh, with a hernia sac filled with the gallbladder fundus between the muscle and the inferior aspect of the prosthesis. After opening of the abdominal wall, the distended gallbladder was exposed with the lysis of multiple cholecysto-enteral and cholecysto-epiploic adhesions. Cholecystectomy was performed in a top-down fashion, with drainage of the sub-hepatic space. The existing mesh was not explanted and we closed the abdomen primarily, suturing muscle to muscle and mesh to mesh where appropriate.

Figure1. Postcontrast CT. Distended and inflamed gallbladder herniated. The gallbladder wall is thickened to 4 mm. and there is hyperenhancing mucosa and extensive pericholecystic inflammation.

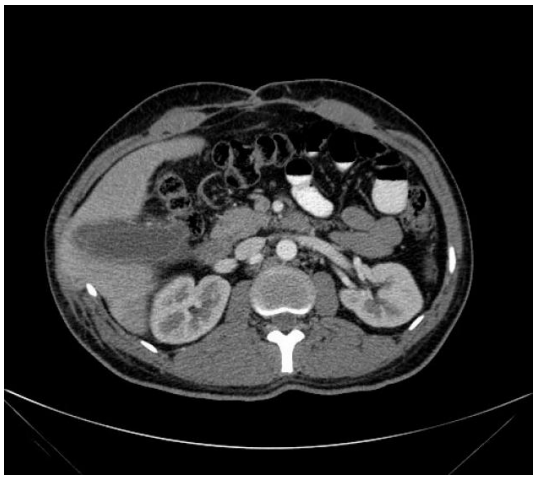
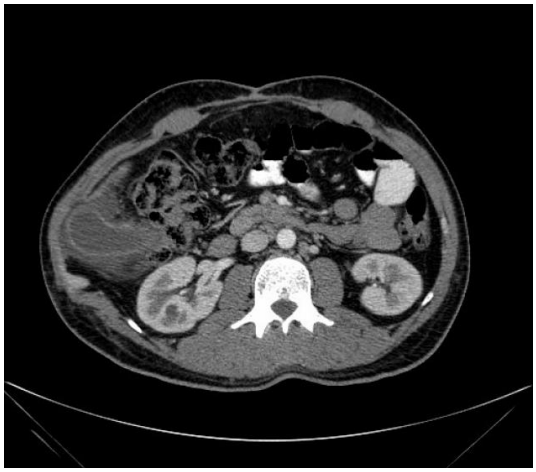


Figure 2. No gallstones are seen. There is no billiary duct dilatation. The muscles of the abdominal wall are atrophied, and the right incisional hernia has been previously closed with mesh.



DISCUSSION

The incidence of incisional hernia is between 2% for clean, elective surgeries, and 20% for contaminated cases (Hodgson, Hoer).

Suture repair of incisional hernia results in recurrence rates of 12% to 54% (Anthony, Luijdenijk), while mesh

repair is followed by a rate of 2% to 36% (Korenkov, Mc Lanahan)

Gunshot wounds, considering the high velocity of projectiles, is the most common cause (64%) of penetrating abdominal trauma, followed by stab wounds (31%) and shotgun blast wounds (5%). The injury patterns differ, depending on the weapon. Low-velocity stab wounds are, generally, less destructive and have a lower degree of morbidity and mortality than gunshot wounds and shotgun blasts. Gunshot wounds and other projectiles have a higher degree of energy and produce fragmentation and cavitation, resulting in greater morbidity.

The most common morbidities following penetrating abdominal trauma are wound infection (2- 8%) and intra-abdominal abscess with or without sepsis (10-80%, depending on presence or absence of bowel injury in combination with major vascular injury). The wound infection, together with the extensive destruction of the abdominal wall, leaded in our case to the recurrence of the incisional hernia.

The presence of an incisional hernia in the RUQ might be complicated by the presence of the herniated gallbladder. In order for the gallbladder to herniate through the defect, it needs to have some particular anatomic predisposing factors, same factors that led to gallbladder volvulus: the presence of a gallbladder mesentery, long longitudinal axis. Both of these feature were present in our case.

The acute cholecystitis of a herniated gallbladder can be triggered by the presence of the stones (obstructive mechanism), or by the strangulation or torsion. Since there was no obstruction, and the intraoperative findings demonstrated the herniated gallbladder through the abdominal wall hernia, we can conclude that the mechanism involved in our case was the strangulation.

There were only two previous cases reported in the literature to describe a gallbladder strangulation within primary incisional hernia (Benzoni, Herich). This is the first case ever reported involving a recurrent incisional hernia. The clinical examination offered enough data to suggest the diagnosis, but the CT scan and the supplementary US examination confirmed and documented the findings.

CONCLUSIONS

The GSW of the abdominal wall have a great risk of developing incisional hernias, and the recurrence rate after the repair, even with mesh, is significantly high. In the rare event of an incisional hernia in the RUQ, and a gallbladder with long mesentery, the strangulation within the hernia sac hernia is possible.

Consent

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

Competing interests. The authors declare that they have no competing interests.

Authors' contribution. A. Popenţiu, D. Moga, C. Weber-Lauer, C. Nieman conceived the study, carried out a detailed literature review, collected and presented the pertinent data. D. S. Kauvar and D. Sabău participated in the study design and coordination and helped to draft the final manuscript. All authors read and approved the final manuscript.

References:

1. Anthony T, Bergen PC, Kim LT, et al. Factors affecting recurrence following incisional herniorrhaphy. World J Surg. 2000;24:95-100

2. Luijendijk RW, Hop WC, van den Tol MP, et al. A comparison of suture repair with mesh repair for incisional hernia. N Engl J Med. 2000;343:392-398.

3. Korenkov M, Sauerland S, Arndt M, et al. Randomized clinical trial of suture repair, polypropylene mesh or autodermal hernioplasty for incisional hernia. Br J Surg. 2002;89:50-56.

4. McLanahan D, King LT, Weems C, et al. Retrorectus prosthetic mesh repair of midline abdominal hernia. Am J Surg. 1997;173:445-449.

5. Hoer J, Lawong G, Klinge U, et al. [Factors influencing the development of incisional hernia: a retrospective study of 2,983 laparotomy patients over a period of 10 years]. Chirurg. 2002;73:474-480.

6. Hodgson NC, Malthaner RA, Ostbye T. The search for an ideal method of abdominal fascial closure: a meta-analysis. Ann Surg. 2000;231:436-442.

7. Benzoni, C.; Benini, B.; Pirozzi, C.; Gallbladder strangulation within an incisional hernia. Hernia. 2004-Dec; vol 8 (issue 4) : pp 387-8

8. Herich, R P ; Vainahii, M V ; Strangulation of the gallbladder in a defect in the anterior abdominal wall, Klinicheskaia khirurgiia (Klin Khir), 1994-; vol (issue 9) : pp 71-2