



Spleen rupture: an unusual postoperative complication after laparoscopic cholecystectomy

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Spleen rupture: an unusual postoperative complication after laparoscopic cholecystectomy

INTRODUCTION: *Laparoscopic cholecystectomy is the gold standard in the surgical treatment of symptomatic cholelithiasis and other benign gallbladder diseases. Laparoscopic cholecystectomy isn't devoid by some complications such as intra and post-operative bleeding, biliary injury, bile leakage, surgical site infection, port-site hernia and visceral injury. After an extensive literature research, we find only one case study in which the patients required a splenectomy after laparoscopic cholecystectomy. We present a case of uneventful laparoscopic cholecystectomy requiring an open splenectomy during the postoperative course.*

CASE REPORT: *The Authors report a case of ruptured spleen during the second post-operative day after an uncomplicated laparoscopic cholecystectomy. At 36 hours after the operation, the patient referred a sudden upper abdominal pain. We performed a splenectomy, intra-abdominal lavage and two drainages have been placed. The patient was discharged in the 7th post-operative day in good clinical condition.*

CONCLUSION: *As best of our Knowledge we report the second case of spleen rupture after a cholecystectomy, which is reported in the literature. We think that the splenic injury should not be due to direct trauma after or at the time of cholecystectomy, but it should be due to some adherences stretched by the pneumoperitoneum induction.*

KEY WORDS: Complication, Laparoscopic cholecystectomy, Laparoscopy Spleen rupture

Introduction

Laparoscopic cholecystectomy (LC) is the gold standard in the surgical treatment of symptomatic cholelithiasis and other benign gallbladder diseases ¹⁻⁵.

This procedure has gained acceptance among surgeons and patients because of its unquestionable advantages in terms of reduced postoperative pain, shorter hospital stay, faster return to everyday living and cosmetics results when compared to the traditional open approach ⁶.

Laparoscopic cholecystectomy isn't devoid by some complications such as intra and post-operative bleeding, biliary injury, bile leakage, surgical site infection, port-site hernia and visceral injury. Actually, the literature has focused almost exclusively on the biliary complications of this procedure, but other complications such as significant haemorrhage can also be encountered, with an immediate mortality if not recognized and treated in a timely manner ⁷.

We report a case of ruptured spleen during the second post-operative day after an uncomplicated laparoscopic cholecystectomy.

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Case presentation

In the June of 2009 a 39 years old man affected by Down syndrome was referred to our institution for symptomatic cholelithiasis. Pre-operative tests did not show any pathological findings.

We performed a laparoscopic cholecystectomy by 3 ports "French" technique⁸. The pneumoperitoneum was performed with "Veress" technique respecting an insufflating volume of 0.5 l/min before umbilical trocar insertion. We used one 11-mm trocar in umbilicus, with a 5-mm laparoscope and two 5mm trocars in right and left side, setting the pneumoperitoneum at 12mm/Hg. The operative time was about 45 minutes, without any intraoperative complications or bleeding.

Normal values of postoperative (3 hours after the operation) blood tests have been found. During the first postoperative day, no analgesic was required and there was a normal passage of flatus, the abdomen was normal without tenderness or guarding. At 36 hours after the operation, the patient referred a sudden upper abdominal pain. The abdominal examination showed a distended abdomen characterized by tenderness in the left upper quadrant, Blumberg's sign and shallow breathing. Immediately blood tests were performed showing a severe anemia: the Hemoglobin (Hb) decreased from 13.8 gr/dl to 7.4 gr/dl and Red blood cell (RBC) from $4.5 \times 10^6/\mu\text{l}$ to $3.2 \times 10^6/\mu\text{l}$. We performed an Ultra Sound (US) Scan that showed an important hemoperitoneum with two major blood collections localized respectively in the right and in the left sub-phrenic space. He was urgently operated through a laparoscopic exploration. We find a 4-cm sub-capsular haematoma ruptured into the peritoneum. So we performed through a midline laparotomy the splenectomy, an intra-abdominal lavage draining about 1liter of blood and two drainages have been placed (the first one in the splenic root and the second one in Douglas' root). During the operation two blood unit transfusions have been practiced. Twelve hours after the splenectomy blood tests were performed, showing an Hb of 9.8 gr/dl. No further transfusions were needed. The histological examination showed a subcapsular haematoma and normal architectural splenic pulp. The remote history of the patient was negative for any kind of trauma during the last year, or hematologic syndrome such as myeloproliferative or myelodisplastic disease or thrombotic thrombocytopenic purpura (TTP). The patient was discharged in the 7th post-operative day in good clinical condition. One week after the discharge the patient performed an abdomen US scan which was negative for any intra-abdominal collection.

Discussion

Laparoscopy gained an important rule in the treatment of many surgical diseases⁹⁻¹¹. Laparoscopic cholecystec-

tomy (LC) represent the gold standard in the surgical treatment of symptomatic cholelithiasis¹⁻⁵, despite some complications such as intra and post-operative bleeding, biliary injury, bile leakage, surgical site infection, port-site hernia and visceral injury.

Few cases of splenic rupture have been described since the beginning of laparoscopy¹²⁻¹⁸.

We found, in literature, six cases of splenic rupture during laparoscopic procedure. In the first one, Mahlke R¹² reports the case of splenic lesion occurred five hours later an uneventful diagnostic laparoscopy; they found a small posterior splenic lesion that was repaired using fibrin glue.

Huchon C¹³ reports the case of a delayed splenic rupture as a severe complication of laparoscopy, occurring 5 days after surgery performed on a 52-year-old woman with history of abdominal surgery and with acute pelvic infection; they found a sub-capsular hematoma, resulting in a splenic rupture that may have been caused by an overlooked puncture by the Veress needle or by tension on splenic adhesions during the adhesiolysis.

Habib¹⁴ reports a case of a 45 years old man who underwent laparoscopy for perforated duodenal ulcer. Urgent laparotomy, on the fifth postoperative day, revealed a diffuse hemoperitoneum consequent upon a posterior sub-capsular haematoma of the spleen. During lavage of the left sub-diaphragmatic area, it's appeared to have torn the spleen at the site of its attachment to the posterior peritoneum. This mechanism could be produced a posterior expanding sub capsular haematoma of the spleen that remained asymptomatic until its rupture. Takeuchi [15] reports a case in which the combination of laparoscopy and preoperative trauma to the left upper quadrant of the abdomen was the responsible.

In other three cases^{16,17}, the Authors suggested that pneumoperitoneum tore on some adhesion between spleen, omentum and abdominal wall.

Splenic injury following LC is more rare complication. After an extensive literature research, we find only one case study¹⁸ in which the patients required a splenectomy 3 weeks following laparoscopic cholecystectomy.

The Authors reported that splenic injury following LC has only been cited in the literature on 2 previous occasions, and their case represents the first, in which the patient underwent an emergency splenectomy.

They also reported that it is unlikely that the patient suffered direct trauma at the time of the LC, either due to laparoscopic trocar insertion or inadvertent injury caused by the laparoscopic instruments as it has previously been reported.

We agree with them about the possibility that this patient had some adhesions of the splenic capsule to the parietal peritoneum. So, the pneumoperitoneum at the start of the LC may have caused a stretching of the splenic capsule which resulting in a small sub-capsular hematoma. It probably has continued to enlarge over the subsequent days ultimately causing a delayed rupture.

This is consistent with our operative and histological findings.

About the routinely use of drainage during an uncomplicated laparoscopic cholecystectomy, we follow the recommendation of a recent Cochrane Review in which the Authors could not find evidence to support the use of drain after laparoscopic cholecystectomy¹⁹.

About any post-operative trauma, we excluded it, seeing a parent assisted the patient during all post-operative period because of its main disease.

We also tried without success to find in literature any correlation between Down syndrome and splenic diseases that may justify his atraumatic break.

Conclusion

At best of our Knowledge we report the second case of spleen rupture after a LC that required an emergency splenectomy, which is reported in the literature. Because of there were not intrinsic pathological abnormality of the spleen, the rupture represents a complication of the LC. However, we think that the splenic injury should not be due to direct trauma after or at the time of cholecystectomy, but it should be due to some adherences stretched by the pneumoperitoneum induction.

Such as suggested by Leff¹⁸ et Al., we think that the visualization of the spleen at the end of laparoscopic cholecystectomy may be very important in order to ensure early recognition and management of such cases.

Riassunto

La colecistectomia laparoscopica costituisce il gold-standard per il trattamento della colelitiasi sintomatica e per le altre affezioni benigne della colecisti. La colecistectomia laparoscopica non è scevra da complicanze come sanguinamenti intra e post operatori, danni alle vie biliari, leakage biliare, infezioni del sito chirurgico, laparoceli o danni d'organo.

Riportiamo un caso di rottura di milza durante la seconda giornata post-operatoria dopo una colecistectomia laparoscopica. Dopo circa 36 ore dall'intervento il paziente ha riferito un dolore improvviso ai quadranti addominali superiori. L'ecografia addominale mostrava un cospicuo emoperitoneo, gli esami ematochimici mostravano severa anemia. Si procedeva dunque a laparoscopia esplorativa d'urgenza durante la quale si è riscontrato un ematoma splenico sottocapsulare di circa 4 cm rotto in peritoneo. Si decideva pertanto ad effettuare una splenectomia previa laparotomia mediana. Il paziente è stato dimesso in settima giornata post-operatoria in buone condizioni cliniche.

Questo è il secondo caso riportato in letteratura di rottura della milza dopo colecistectomia laparoscopica che ha richiesto una splenectomia. Riteniamo che il danno

al parenchima splenico non sia dovuto ad un trauma diretto durante o dopo la colecistectomia laparoscopica. Bensì la rottura della capsula splenica potrebbe essere stata causata dalla disinserzione di alcune aderenze splenoparietali durante l'induzione dello pneumoperitoneo, come suggerito dagli altri autori.

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Commento e Commentary

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L'articolo "Spleen Rupture: an unusual postoperative complication after Laparoscopic Cholecystectomy" di Bracale U, Coll., Merola G, Lazzare F, Spera E, Pignata G rappresenta un interessante osservazione clinica.

Nella valutazione della vicenda clinica si riconosce la sequenza: intervento chirurgico laparoscopico - rottura della milza pur non esistendo alcuna preliminare patologia splenica. Non è chiara dunque la dinamica della lesione intraoperatoria, se si è trattato cioè di un trauma diretto (per esempio ad opera dell'ago di Veress), se da trazione sull'epiploon che possa aver indotto una lacerazione della capsula splenica, oppure una trazione su preesistenti connessioni tra la milza e le pareti addominali, con conseguente lacerazione della capsula splenica dopo l'instaurazione dello pneumoperitoneo.

Peraltro bisogna considerare che si è trattato di una lesione in due tempi con rilevante intervallo rispetto all'intervento stesso: forse la rottura di un ematoma sub-capsulare e conseguente emoperitoneo. Comunque non si tratta di una patologia direttamente connessa con l'intervento di colecistectomia ma piuttosto connessa con l'accesso laparoscopico.

Al termine dell'intervento il controllo diretto esteso ad ogni settore dell'addome potrebbe essere una precauzione efficace. Infine la tecnica che adotta l'ago di Veress per l'induzione dello pneumoperitoneo sembrerebbe meno sicura dell'accesso sotto visione diretta secondo Hasson.

* * *

The article "Spleen Rupture: an unusual postoperative complication after Laparoscopic Cholecystectomy" by Bracale U, Merola G, Lazzare F, Spera E, Pignata G. is an interesting case report.

By the evaluation of the clinical event, we recognize the sequencing: laparoscopic surgical operation – spleen rupture: in fact, there isn't any pre-existent spleen pathology.

The possible mode of intraoperative trauma is unclear: direct trauma (for example Verness' needle), tractions on the epiploon that could induce splenic capsular lacerations, or tractions on pre-existent spleno-abdominal wall connections (and consequent splenic capsular lacerations) after the onset of pneumoperitoneum.

Besides, we must consider that it's a two-time lesion for the long time range of the operation: subcapsular hematoma formation and next break with hemoperitoneum.

Furthermore, it isn't a morbidity directly connected with surgical operation of cholecystectomy, but it's linked to laparoscopic access.

At the end of operation, the direct control of every abdominal sector could be a valid advice.

At last, Verness technique to induction of pneumoperitoneum would seem be less safe than Hasson open access.

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