

Minimally invasive approach of the most common complications after laparoscopic cholecystectomy



Ann. Ital. Chir., 2005; 76: 235-238

Aldo Bove*, Giuseppe Bongarzone*, Gino Palone*, Stella Chiarini**, Luciano Corbellini*

*Department of Surgical Experimental and Clinical Science, and **Department of Science of Aging, University "G. D'Annunzio", Chieti, Italy.

Minimally invasive approach of the most common complications after laparoscopic cholecystectomy (LC)

AIM OF THE STUDY: LC is now considered the gold standard in the treatment of cholelithiasis with a minimal incidence of complications, typically, bile peritonium and hemoperitonium.

METHODOLOGY: The Authors wished to verify the possibility of treating complications after LC with a minimally invasive approach. In 1100 LCs over 8 years, they treated 9 bile peritonium and 4 hemoperitonium.

RESULTS: It was possible to treat all 13 patients with a minimally invasive approach with a complete resolution of the complication and with no further occurrences during the follow up.

CONCLUSIONS: The Authors believe that it is possible to treat the majority of complications arising after LC with minimally invasive methods. Nevertheless, a very early diagnosis and the close cooperation of an Endoscopist and an Radiologist is necessary.

KEY WORDS: Complications, Laparoscopic cholecystectomy.

Introduction

Laparoscopic surgery represents nowadays a solid reality in which the advantages are well established in terms of absence of pain, early post operative recovery and lower cost ¹.

Cholecystectomy was the surgical procedure that first bridged the gap between traditional surgical approaches and laparoscopic ones, and having also all the benefits of minimally invasive surgery.

Perfection, however, is an aim to aspire to and not an achieved goal; this also must be true for laparoscopy when we consider the immediate, early, and late complications that can exist.

Nonetheless, complications have not increased over the traditional surgical approach ². Although there are specific complications in the laparoscopic cholecystectomy (LC) such as vascular or visceral lesions, but those are extremely rare and avoidable with a careful execution.

On the other hand, the debate concerning lesions of the common bile duct, the most unwanted complication of LC, continues. The literature establishes that the incidence of these lesions is no different from open surgery ³, and the alarming data of the early '90's is explained by the optimizing of the techniques and by the requirement to train in the new method. An increase in the complications bile leakage and hemoperitonium represents the main drawback of LC when compared with open procedure ^{4,5}. Experience and a careful technique can reduce the incidence of these effects. On the other hand, we have to consider that now even acute cholecystitis ⁶ and choledocholithiasis ⁷ can be successfully treated with laparoscopic technique so that the incidence of complications must be higher. The aim of this work is to confirm the validity of the minimally invasive approach of treating complications occurring after LC and the clinical and diagnostic features and timing required to obtain the best results.

Materials and methods

From 1998 to 2003, we performed 1100 LC (mean age 63 years; 715 females; 385 males). 90 (8,1%) patients had acute cholecystitis, 60 (5.5%) patients had a choledocholithiasis.

Pervenuto in Redazione Settembre 2004. Accettato per la pubblicazione Febbraio 2005.

For correspondence: Aldo Bove, MD, Dept. of Surgery, Università "G. D'Annunzio", Palazzina SE.BI., 66013 Chieti, Italy (e-mail: above@unich.it).

lithiasis diagnosed before or during the operation. Intraoperative cholangiography was performed in 220 cases when choledocholithiasis or bile ducts abnormalities were suspected. In 1040 patients we performed a LC but in 20 cases an extraction of the stone from the bile ducts was necessary and in 10 cases an intraoperative sphincterotomy due to choledocholithiasis was necessary. In the remaining 30 patients with choledocholithiasis we performed a preoperative clearance of the bile duct. Each patient was submitted to a daily control with hematologic tests and ultrasonography at 12 and 24 hours after the operation and, in the absence of complications, dismissal of patients was on the first (25%) or second (75%) day after the operation. In those patients with clinical or instrumental abnormalities, we proceeded with further investigation such as TC or ERCP. The percentage of regression from LC to open surgery was 33 (3%), typically related to previous abdominal surgery or acute cholecystitis. No mortality during surgery was recorded. We reported only one case of partial lesion of the bile common duct (0.1%), while in 2 patients who had previous abdominal surgery, we made a visceral lesion during the pneumoperitoneum. The most frequent complications were bile peritonitis (9 cases: 4 due to cystic duct dehiscence; and 5 for bile leakage from the gall bladder bed), hemoperitoneum (4 cases for leakage from the gall bladder bed) and, during the follow up, ventral hernia (7 cases; 2 at the trocar site).

Results

The patient with a partial lesion of the bile duct was immediately diagnosed and subsequently was treated with a direct repair and Kehr drainage, while we repaired the visceral lesion of the two patients after a conversion from LC to open surgery. In all the 13 patients with bile peritonitis and hemoperitoneum, a minimally invasive approach was used. In particular, the 4 patients with dehiscence of the cystic duct were treated within 24 hours from LC; 2 patients were reoperated with a laparoscopic access and a new application of clips, whereas for the other two, endoscopic sphincterotomy plus nasobiliary drainage was the treatment of choice. In the other 5 patients with bile peritoneum, we applied within 72 hours after LC, a drainage using either an ultrasonography scan guide or a TC scan guide in order to evacuate a bile collection in the gall bladder bed. In the 4 patients with hemoperitoneum, 3 underwent a laparoscopic second look within 18 hours in order to empty out the haematoma and haemostasis of the small vessels of the gall bladder, while for the fourth, the second look was not necessary because the clinical and instrumental monitoring was sufficient. The mean stay of hospitalization for the patients who underwent laparoscopic surgery for a complications after LC was 10 days, with a complete resolution of the pathological features in every case (mean follow up 3.5 years).

Discussion

LC is widely recognized as the gold standard in the treatment of cholelithiasis⁸. The method is as effective, with better results in terms of early recovery, absence of pain, and lower cost². The debate concerning lesions of the common bile duct, the most unwanted complication of LC, continues. Different authors dispute the incidence of complications. The published data is inconclusive. In some studies, authors report no significant increase⁹, while in others there are indications an increase of up to 0.5% in bile duct lesions¹⁰. The explanation for this discrepancy lies with the training learning curve¹¹ and errors in the surgical technique occurring particularly when the operation is performed in the presence of abdominal inflammation or adhesions¹². The lesion of the common bile duct, although the most serious complication¹³, is not the most frequent. These are bile leakage and hemoperitoneum. In our opinion, it is important to distinguish bile leakage from the lesion of the bile duct because of their differing severities and treatments. Wolfe et al.¹⁴ report an incidence of bile leakage of 1,3% in a series of 381 LC, while Walzer et al.¹⁵ describe 7 bile leaks in a series of 264 LCs (2.7%). These results show a higher incidence than open surgery, with the following causes. The most common is the dislocation of clips from the bile duct and this can happen more readily when the duct is dilated; this occurred in 2 of our cases. Alternatively, an interruption of the bile can occur immediately after the operation and this occurred in another 2 of our cases. In our other cases, bile peritonitis occurred due to a leakage either from Luschka⁴ or from abnormal vessels. As we have said, the inflammation can enhance the occurrence of complications. So together with a careful operative technique, some authors recommend using intra-operative colangiography in order to reveal the presence of abnormal vessels or defective biliary flow. The post-operative hemoperitoneum also can be considered a problem specifically related to LC. B.V MacFadyen⁸ reported in a study of 26450 LC, 123 hemoperitoneum (0.47%) and confirmed inflammation as the main cause. The treatment options are many¹⁶ but we wish to stress that a minimally invasive approach is both generally possible and recommended. Over 7 years we performed 1100 LCs that resulted in 9 cases of bile leakage (0,81%) and 4 of hemoperitoneum (0.36%). We concluded that a successful minimally invasive approach depends on an early diagnosis of complications and for this reason we routinely test clinically and instrumentally our patients after 12 and 24 hours. When a dehiscence of the bile duct occurred within 24 hours (4 patients), a laparoscopic second look (2 patients) or a nose biliary drainage (2 patients) were successful. In case of any clinical doubt, an ERCP can clarify the situation and permit a resolution of the problem^{17,18}. Also in case biliary leakage from the gall bladder bed, an early diagnosis can allow

a minimally invasive technique using operative radiology with the application of either ultrasonography or TC guided drainage. In 5 of our cases, it was possible to identify and treat the patient within 72 hours of the operation. We do not believe that the routine use of intraoperative cholangiography can reduce these complications¹⁹ and so we advise using it only when choledocholithiasis is suspected or when the anatomical outcome is not clear. The percentage of haemorrhagic complications is rare. Here, we do not mean the very rare direct lesion of a vessel but the leakage of blood from the gall bladder bed. This occurred in 3 patients with acute cholelithiasis and it is well known how a small leakage of blood in the haemoperitoneum can become significant after the decompression. Early diagnosis of the clinical outcome has allowed a laparoscopic treatment within 18 hours consisting of emptying the haematoma and careful haemostasis. No transfusion was required.

Conclusions

Over the last decade laparoscopic techniques have revolutioned methods of treatment of many surgical pathologies. Today laparoscopy is the gold standard for the treatment of cholelithiasis. The essence of laparoscopy is minimally invasive surgery. The incidence of complication after LC is comparable to open surgical techniques. Those complications that are more associated with the laparoscopic approach are bile leakage and haemoperitoneum. In the treatment of these complications, we also maintain a minimally invasive approach. However, in order to achieve good results, a very early diagnosis of any complication is essential. For this reason, we propose a very careful monitoring of the patient in the first 24 hours and the availability of a Radiological and Endoscopy Unit. We conclude that the majority of complications occurring after LC can be safely and successfully treated with minimally invasive techniques after an early diagnosis.

Riassunto

La colecistectomia laparoscopica si è dimostrata metodica sicura ed efficace con una minima incidenza di complicanze costituite nella maggior parte di casi da coloperitoneo e emoperitoneo.

Gli Autori hanno voluto verificare la possibilità di trattare anche tali complicanze con un approccio mininvasivo. Negli ultimi 8 anni su 1100 colecistectomie laparoscopiche sono stati riscontrati 9 casi di coleperitoneo e 4 di emoperitoneo. Tutti questi quadri sono stati affrontati e risolti con metodiche mininvasive. Sono necessarie, per ottenere i migliori risultati, una diagnosi precoce della complicanza e la collaborazione, in specifici casi, dell'endoscopista e del radiologo interventista.

References

- 1) Hannan E, Imperato P, et al.: *Laparoscopic and open cholecystectomy in New York State: mortality, complications, and choice of procedure*. Surg, 1999; 223-31.
- 2) Archer SB, Brown DW, Smith DC, Braum GD, Hunter JG: *Bile duct injury during laparoscopy cholecystectomy. Results of a National Survey*. Ann. Surg, 2001; 234 (4):549-59.
- 3) Jamshidi M, Obermeyer RJ, Garcia G, Hashmi M: *Post-laparoscopic cholecystectomy bile leak secondary to an accessory duct of Luschka*. Int Surg, 1999; 84:86-88.
- 4) Wise Unger S, Glick GL, Landeros M: *Cystic duct leak after laparoscopic cholecystectomy. A multi-institutional study*. Surg Endosc, 1996; 10:1189-193.
- 5) Brodsky A, Matter I, Sabo E, Cohen A, Abrahamson J, Eldar S: *Laparoscopic cholecystectomy for acute cholecystitis: can the need for conversion and the probability of complications be predicted? A prospective study*. Surg Endosc, 2000; 14:755-60.
- 6) Cox M., Wilson T, Toouli J: *Preoperative endoscopic sphincterotomy during laparoscopic cholecystectomy for choledocholithiasis*. Br J Surg, 1995; 527-29.
- 7) Steinle EW, Vandermolen RL, Silbergleit A, Cohen MM: *Impact of laparoscopic cholecystectomy on indications for surgical treatment of gallstones*. Surg Endosc, 1977; 933-35.
- 8) MacFadyen BV jr, Vecchio R, Ricardo AE, Mathis CR: *Bile duct injury after laparoscopic cholecystectomy. The United States experience*. Surg Endosc, 1998; 12:315-28.
- 9) Koperna T, Kisser M, Schulz F: *Laparoscopic versus open treatment of patients with acute cholecystitis*. Hepatogastroenterology, 1999; 46(26):753-57.
- 10) Moore MJ, Bennet CL: *The learning curve for laparoscopic cholecystectomy. The Southern Surgeon's Club*. Am J Surg, 1995; 170:55-59.
- 11) Traverso LW: *Risk factors for intraoperative injury during cholecystectomy*. Ann Surg, 1998; 458-59.
- 12) Shallaby GE, Cushieri A: *Nature, aetiology and outcome of bile duct injuries after laparoscopic cholecystectomy*. HPB, 2000; 2:3-12.
- 13) Wolfe BM, Gardiner BN, Leary BF, Frey CF: *Endoscopic cholecistectomy. An analysis of complications*. Arch Surg, 1991; 126:1192-198.
- 14) Walker AT, Shapiro AW, Brooks DC, Braver JM, Tumeii SS: *Bile duct disruption and biloma after laparoscopic cholecystectomy: imaging evaluation*. AJR Am J Roentgenol, 1992; 158:785-89.
- 15) Doctor N, Dooley J, Dick R, Watkinon A, Rolles K, Davidson B: *Multidisciplinary approach to biliary complications of laparoscopic cholecystectomy*. Br J Surg, 1998;627-32.
- 16) Barthel J, Scheider D: *Advantages of sphinterectomy and nasobiliary tube drainage in the treatment of cystic duct stump leak complicating laparoscopic cholecystectomy*. Am J Gastroent, 1995; 1322-324.
- 17) Hanazaki H, Sodeyama H, et al.: *Endoscopic nasobiliary drainage for bile duct injury after laparoscopic cholecystectomy*. Surg Endosc, 1997; 1123-125.

18) Fletcher D, Hobbs M, et al.: *Complication of cholecystectomy: risks of the laparoscopic approach and protective effects of operative cholangiography*. Ann Surg, 1999; 449-57.

19) Koperna T, Kisser M, Schulz F: *Laparoscopic versus open treatment of patients with acute cholecystitis*. Hepatogastroenterology 1999; 46(26):753-57.