

Choledocholithiasis and endo-laparoscopic rendezvous.

Analysis of 59 consecutive cases



Ann. Ital. Chir., 2011 82: 221-224

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Choledocholithiasis and endo-laparoscopic rendezvous. Analysis of 59 consecutive cases

BACKGROUND: *Choledocholithiasis is a real problem of major clinical importance. The incidence of cholelithiasis is 10-20%.*
MATERIALS: *We have examined 2907 patients treated with videolaparoscopic cholecystectomy (VLC) between January 2001 and September 2009. 214 cases (7.4%) were affected by choledocolithiasis; among these, 59 consecutive cases were treated by rendezvous, 151 cases by sequential treatment (ERCP-ES before VLC), 3 cases by extraction with Dormia's basket, and 1 case by ERCP-ES after VLC.*

RESULTS: *The complications were one biliary fistula and three hemorrhages (one from the cystic artery, one from the hepatic area and one from trocar's site). The mean hospital stay was 1.38 ± 0.83 days for the rendezvous group vs 4.53 ± 0.74 days in the sequential treatment group ($p < 0.004$). The satisfaction scores were 6.6 ± 1.39 versus 5.7 ± 0.96 ($p < 0.004$).*

CONCLUSIONS: *The rendezvous procedure reduces hospital stay and has a greater compliance (only one treatment). We can use this option in the management of cases where preoperative ERCP-ES has failed.*

KEY WORDS: Cholelithiasis, Choledocolithiasis, VLC, ERCP, Rendezvous, Dormia Basket.

Introduction

Choledocholithiasis is a problem of remarkable clinical importance, as demonstrated by its incidence, clinical manifestations, and outcomes with sometimes severe complications; nevertheless, great variabilities still exist in the diagnostic and therapeutic distances¹. 10% of the female population and 6% of the male population are affected by cholelithiasis. We know that the lithiasis of

the common bile duct (CBD) is associated with gallstones in 10-20 % of patients, with the percentage of association between 8% and 15% in patients under the age of 60 and between 15% and 60% in patients over the age of 60².

Choledocholithiasis figures most commonly like a complication of gallstones, due to stones moving to the cystic duct from the gallbladder.

Choledocholithiasis is a significant source of morbidity, and an optimal program of treatment must preview their identification and removal (pre-, intra-, or post-operatively). In our geographic area, lithiasis of the gallbladder is mostly due to the formation of cholesterol stones¹. We define symptomatic patients as those for whom the cholelithiasis has caused or causes biliary pain (a severe pain in the right hypochondrium or in the epigastric area of a duration of at least half an hour) or complications directly associated with the lithiasis (cholestatic jaundice, acute pancreatitis, or acute chole-

Pervenuto in Redazione Novembre 2010. Accettato per la pubblicazione Dicembre 2010.

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cystitis). On the basis of this definition of "symptomatic," it is estimated that approximately 2/3 of patients with stones are asymptomatic. The switch from the absence of symptoms to being symptomatic occurs in the space of 3 years in about 0.5 to 4% of patients; in contrast, in 50% of the symptomatic cases, the clinical course worsens with further symptoms and complications³. The predictive factors for the future development of symptoms in asymptomatic lithiasis are not clear. The majority of patients switch to being symptomatic because of biliary pain and rarely because of a biliary complication. With the exception of simple cholelithiasis, over a long time, choledocholithiasis remains asymptomatic only in less than 15% of cases².

Although choledocholithiasis can remain asymptomatic for a long time, altered biliary flow can suddenly cause typical biliary pain and the fast onset of obstructive jaundice, with fluctuations in time due to the possible movement of stones inside the CBD.

If bacterial supra-infection occurs, the patient presents with an acute episode of cholangitis. The fever is of the septic type with hyperthermia over 39°C. The most life threatening form (suppurative cholangitis) can lead to septic shock if it is not rapidly treated with decompressing endoscopy or surgery of the CBD.

The surgical treatment of biliary stones has been modified in the last decade. In the 1990s, we were introduced to one true revolution: videolaparocholecystectomy (VLC), which in a few years replaced open cholecystectomy and became the gold standard for the treatment of the cholelithiasis. As a result, hospitalization became shorter and mortality became close to zero. The surgical risk for this procedure depends more on the presence of severe co-morbidities than on patients' advanced ages⁵. In France in 1987, Mouret performed videolaparocholecystectomy for the first time. The technique was then improved by Dubois in 1988, with successive explosive spread. According to Dubois' experience with 2006 videolaparoscopic cholecystectomies, the mortality rate is 0.05% and the morbidity rate is 2.24%⁶. Here, we present our experiences with 59 consecutive cases treated with rendezvous at the Institute of General Surgery and Organ Transplantation, School of Medicine, University of Parma.

Materials and methods

From January 2001 to September 2009, 59 cases of choledocholithiasis treated with an endolaparoscopic approach out of 2907 cases of cholelithiasis treated with VLC are respectively analyzed.

The two surgical approaches in use to treat cholelithiasis were analyzed, with exclusion from laparoscopic treatment of patients with portal hypertension, coagulopathies, third trimester pregnancies, and suspected gallbladder cancer.

Cardiac diseases and respiratory insufficiency are conditions in which there is a risk for the use of pneumoperitoneum; therefore, those were considered relative contraindications. A greater incidence of laparotomic conversion is associated with previous surgical treatment, especially if it occurred in the upper gastrointestinal tract, but this is not associated with greater morbidity or mortality.

The conversion rate is greater in urgent VLC than in elective procedures. For all patients, we took an accurate anamnestic history, controlled the serological parameters, and paying greater attention on alterations in cytolysis values and on echotomographic examination.

When pathological values of cholestasis markers were found, a second abdominal echographic evaluation was performed in order to confirm the presence of CBD expansion at the time of hospitalization due to choledocolithiasis.

An unclear echographic picture led to the performance of a colangio-RM exam. In cases of a certain pre-operative diagnosis of choledocolithiasis, the patient were treated with endo-laparoscopic rendezvous, which consists in videolaparocholecystectomy and endoscopic retrograde cholangiography with sphincterotomy by an equip of surgeons and an equip of endoscopists that operated at the same time (preferential option).

In the case of organizational difficulties in organization, treatment was usually performed in at two separate times: ERCP+ES, with a subsequent VLC 24-48 hours afterward. We here examined the two groups of patients. The rendezvous procedure foresees always the videolaparocolecistectomy with intra-operative cholangiography.

In cases of choledocolithiasis, we began by introducing a duodenoscopic instrument to perform a sphincterotomy; in cases of anatomically difficult of getting in Vater's papilla, a transcystic guide-wire was positioned to the duodenum in course of VLC with subsequent sphincterotomy and extraction of stones with a Dormia basket.

Control of amylasemia and cholestasis indices over the next 24 hours was usually established, with and patients being discharged between the first and second post-operative days. In cases of failure of the CBD stone clearing process by endoscopic treatment, we used classic open surgery, with a minilaparotomic surgical approach in selected cases only if the senior was an expert in minilaparocholecystectomy. All treated patients were asked to point a satisfaction score on a numerical scale from 0 (minimum) to 10 (maximum), and all underwent a follow-up for at least 6 months. The data were analyzed with a Student's t test.

Results

From January 2001 to September 2009, 214 (7.3%) of 2907 patients treated with VLC had an associated choledocolithiasis.

151 patients were treated with endoscopic sphincterotomy before VLC; in 3 cases, the extraction of the stones was done with a Dormia basket introduced through the

TABLE I - January 2001 - June 2009. 2907 VLC – 214 (7.3 %) CHOLEDOCOLITHIASIS

59 PTS	RENDEZVOUS
151 PTS	ERCP-ES BEFORE VLC
3 PTS	INTRAOPERATIVE EXTRACTION
1 PT	ERCP-ES AFTER VLC

TABLE II - Complications

1 PT	BILIARY LEAK*
3 PTS	HEMORRHAGE**
2 PT	SKIN INFECTION**

NO COMPLICATIONS FOR ERCP-ES

**RENDEZVOUS

*SEQUENTIAL TREATMENT

Table III

	Rendezvous 59 cases	Sequential treatment 151 cases	
Hospital stay	1,38±0,83 days	4,53±0,74days	p<0.001
Satisfaction Score	6,6±1,39	5,7± 0,96	p<0.004

cystic duct during VLC; 59 cases underwent endo-laparoscopic rendezvous; 1 case of misdiagnosed choledocholithiasis underwent ERCP+ES after VLC (Table I). Among these cases, the complications included one low flow biliary fistula, three cases of hemorrhage (one of the hepatic area, one case of loss of the cystic artery clip and one case from trocar's site), and two infections of the camera's trocar (Table II). The mortality was none. The mean hospital stay for the 59 patients treated with the rendezvous combination was 1.38 ± 0.83 days, while it was 4.53 ± 0.74 days for the 151 patients treated with VLC after ERCP+E. A comparison between the groups showed a statistically significant difference (p<0.005) in favor of the rendezvous combination. There were no complications due to the endoscopic operating procedure in either group. Analysis of the patients' satisfaction test scores 24 hours after the end of both procedures revealed a mean score in the first group of 6.6 ± 1.39 versus 5.7 ± 0.96 in the second group (p<0.004 (Table III).

Discussion

The application of the new managerial criterion of a "short hospital stay" has been considered an advantageous protocol, not only from an economical point of view, but also because it results in meets the realization

of patients' expectations. It has lessened the traditional risks of open surgery (immobility in bed, post-operative pain, late resumption of feeding) and has led in the past few years to a revolution, with shorter hospitalizations and a reduction in complications (mainly infective complications). Intraoperative guidelines for the diagnosis of choledocholithiasis in open surgery are no longer available, and with a consequent increase in the importance of preoperative imaging, we can obtain cholangioRM images of the biliary tree like those in directed cholangiographies and PTC, without the use of a contrast medium, and above all without invasive procedures ⁷. The use of frequency-weighted T2, that exalt fluid marks (the bile and the pancreatic juice), allows the for visualization of the biliary tree and the pancreatic tissue, also giving warranty to guaranteeing clinicians of an easier diagnostic understanding than the one supplied by echography. Under normal conditions, cholangio-RMN can visualize the CBD and the biliary tree. In choledocholithiasis, the stones are characterized by a low intensity mark and are identified as filling defects inside of the CBD with elevated intensities.

Although cholangio-RMN is not applied to studies of gallstones, which are usually identified by echography studies, cholangio-RM is useful in the visualization of concomitant choledocholithiasis ⁸ and of anomalies in the morphology of the CBD or the cystic duct, which are possible causes of iatrogenic complications affecting the CBD during cholecystectomy.

In the present analysis, the advent of cholangio-RMN has remarkably modified the approach to patients with obstructive jaundice, and it has achieved greater importance than the relative to abdominal echography.

ERCP must be performed only if the goal is the therapeutic resolution of jaundice. We can therefore consider a new diagnostic-therapeutic algorithm in cases of jaundice suspected to be due to choledocholithiasis.

ERCP with pre-operative endoscopic sphincterotomy, which permits withdrawal of stones from reclamation of the CBD, was initially considered the more appropriate technique for choledocholithiasis, without renouncing the benefits of laparoscopic surgery (sequential treatment). Post-operative ERCP is generally used in those patients for whom choledocholithiasis was not initially recognized; this choice depends on the availability of an equip of expert endoscopists; a failed post-operative ERCP could lead the patient to undergo a second surgical surgical procedure. Currently, for the treatment of the cholecysto-choledocholithiasis, the guidelines indicate an endo-laparoscopic rendezvous endoscopic-laparoscopic ⁹, which has been practiced by Deslandres since 1993 ¹⁰.

The rendezvous ultimately actually reduces hospital stay ¹¹⁻¹³ and results in greater patient compliance (only one treatment). The use of laparoscopic treatment of cholelithiasis is correlated compared with the availability of laparoscopic access to the CBD and the risks of surgical complications due to choledocholithotomy. We

can summarize in three aims the reasons why we prefer the rendezvous procedure to reclamation of the CBD through laparoscopic choledocolithotomy:

- the hospital stay is shorter;
 - suture of the CBD exposes the patient to the common risks of the biliary suture, which include stenosis and biliary fistulas;
 - according to the literature, the risks of an endoscopic sphincterotomy are acceptable and correlated with the endoscopic experience of the physician.
- The real problem¹⁴ is the difficulty in coordinating the two teams, which must cooperate closely. For this reason, in many centers, the VLC is performed 24-48 hours after the endoscopic procedure, however equally valid like final results^{15,16}.

At our institute, by combining the two professional roles in the same team, we have satisfactorily easily resolved the problem. According to our experience, the shortened mean hospital stay and the possibility for complete management of the pathology by the same surgical team leads us to prefer a combined, one-time treatment, rather than the sequential ones treatments when technical and organizational conditions are permissible allow¹⁷. Finally, we want to remember the usefulness of the rendezvous procedure in the management of the cholelithiasis, above all in cases where an ERCP-ES has failed; during a VLC, it is in fact possible to put a can in the cystic duct with a guide, which subsequently helps the endoscopist to perform the ES-ERCP.

Riassunto

BACKGROUND: La coledocolitiasi è un problema clinico di reale rilevanza. La incidenza della coledocolitiasi è pari al 10-20%.

MATERIALI E METODI: Abbiamo esaminato 2907 pazienti trattati con colecistectomia video laparoscopica (VLC) tra il gennaio 2001 ed il settembre 2009. 214 casi (7,4%) presentavano coledocolitiasi; 59 casi sono stati trattati con rendez-vous endolaparoscopico, 151 casi da trattamento sequenziale (ERCP-ES prima di VLC), in 3 casi da estrazione con Dormia trans cistico e in un caso da ERCP-ES dopo VLC.

RISULTATI: Le complicanze che abbiamo registrato sono state una fistola biliare e tre casi di emorragia (un caso di emorragia dall'arteria cistica, uno dal letto epatico ed uno dal punto di inserzione del trocar). La degenza media è stata pari a $1,38 \pm 0,83$ giorni per il gruppo trattato con rendez vous e $4,53 \pm 0,74$ giorni per il gruppo trattato con approccio sequenziale ($p < 0,004$). La scala di gradimento espresso è stato $6,6 \pm 1,39$ verso $5,7 \pm 0,96$ ($p < 0,004$).

CONCLUSIONI: La procedura rendez vous riduce la degenza media ed ha una quota di gradimento maggiore (solo un trattamento). Si può utilizzare il trattamento rendez vous anche nei casi di pazienti dove l'ERCP ES preoperatoria ha fallito.

References

- 1) GREPCO (Rome group for the epidemiology and prevention of cholelithiasis): *The epidemiology of gallstone in Rome, Italy*. Hepatology, 1988; 8:904-13.
- 2) Jordan GJ: *Choledocholithiasis*. Curr Probl Surg, 1982; 19:722-98.
- 3) Dell'Abate P, Del Rio P, Colla G, Sianesi M: *Choledocholithiasis caused by migration of a surgical clip after video laparoscopic cholecystectomy*. J Laparoendosc Adv Surg Tech A, 2003; 13(3):203-4.
- 4) Guibaud L, Bret PM, Reinhold C: *Diagnosis of choledocholithiasis: Value of MR cholangiography*. A J R, 1994; 63:847-50.
- 5) Moreaux J, Bonnet JL, Gerum A: *La chirurgie biliaire après 75 ans: 100 cas opérés*. Nouv Presse Med, 1982; 11:647-50.
- 6) Dubois F, Berthelot G, Levard H: *Coelioscopic cholecystectomy: Experience with 2006 cases*. World J Surg, 1995; 19:748-52.
- 7) Shanmugam, et al.: *Is magnetic resonance cholangiopancreatography the new gold standard in biliary imaging?* Br J Radiol, 2005; 78(934):888-93.
- 8) Neri V, Fersini A, Ambrosi A, Tartaglia N, Valentino TP: *Diagnostic evaluation prior to cholecystectomy in mild-moderate acute biliary pancreatitis*. Ann Ital Chir, 2009; 80(5):363-67.
- 9) Tricarico et al.: *Endolaparoscopic rendez-vous treatment: A satisfying therapeutic choice for cholecystocholedocolithiasis*. Surg Endosc, 2002; 16(4):585-88.
- 10) Deslandres E, et al.: *Intraoperative endoscopic laparoscopic cholecystectomy*. Gastrointest Endosc, 1993; 39:54-58.
- 11) Enochsson, et al.: *Intraoperative endoscopic retrograde cholangiopancreatography (ERCP) to remove common bile duct stones during routine laparoscopic cholecystectomy does not prolong hospitalization*. Surg Endosc, 2004; 18(3):367-71.
- 12) Ghazal AH, Sorour MA, El-Riwini M, El-Bahrawy H: *Single step treatment of gallbladder and bile duct stones: A combined endoscopic-laparoscopic technique*. Int J Surg, 2009; 7(4):338-46.
- 13) Tzovaras G, Baloyannis I, Kapsoritakis A, Psychos A, Paroutoglou G, Potamianos S: *Laparoendoscopic rendezvous: An effective alternative to a failed preoperative ERCP in patients with cholecystocholedocholithiasis*. Surg Endosc, 2010; 24(10):2603-606.
- 14) Cavina E, Franceschi M, Sidoti F, Goletti O, Buccianti P, Chiarugi M: *Laparo-endoscopic "rendez-vous": A new technique in the choledocholithiasis treatment*. Hepatogastroenterology, 1998; 45(23):1430-35.
- 15) Allen NL: *Outcomes of cholecystectomy after endoscopic sphincterotomy for choledocholithiasis*. J Gastrointest Surg, 2006; 10(2):292-96.
- 16) Williams GL, et al.: *Selective operative cholangiography and Perioperative endoscopic retrograde cholangiopancreatography (ERCP) during laparoscopic cholecystectomy: A viable option for choledocholithiasis*. Surg Endosc, 2002; 16(3):465-67.
- 17) Vries A, Donkervoort SC: *Conversion rate of laparoscopic cholecystectomy after endoscopic retrograde cholangiography in the treatment of choledocholithiasis: Does the time interval matter?* Surg Endosc, 2005; 19(7):996-1001.