

Diagnostic evaluation prior to cholecystectomy in mild-moderate acute biliary pancreatitis



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OBJECTIVES: *The importance of papillary obstruction in the pathogenesis of acute biliary pancreatitis (ABP) is widely recognized. The aim of this study was to evaluate the usefulness of the MRCP before the VLC in the patients with mild acute biliary pancreatitis.*

METHODS: *In the period 2003-2008, 47 patients were submitted to a MRCP (F/M: 28/19) with mild ABP without increase of the cholestasis tests and absence of choledocholithiasis at the abdominal US. During a follow up from 30 to 60 days after the VLC, the presence of jaundice or relapse of ABP were evaluated in all patients.*

RESULTS: *Thirteen patients had diagnosis of choledocholithiasis at the MRCP and they were submitted to an ERCP, endoscopic sphincterotomy and stones removal; 34 patients with a negative MRCP were submitted to the VLC. Among these, on 10th postoperative days, one patient has had recurrent ABP, and was submitted to ERCP/ES. All the 47 patients submitted to the MRCP before the VLC did not have jaundice or relapse of the ABP during the follow-up period.*

CONCLUSION: *The MRCP was an accurate investigation for the preoperative diagnosis of choledocholithiasis; even if it is not possible to recommend its utilization extensively, it is an important procedure for the patients with diagnosis of mild ABP to select all those to submit to the ERCP.*

Key words: Acute pancreatitis, Cholecystectomy, Mild, MRCP.

Introduction

The importance of papillary obstruction in the pathogenesis of acute biliary pancreatitis is widely recognized. The relationship between the obstruction of the principal biliary duct by stones that have migrated from the gallbladder and acute biliary pancreatitis was first described in 1901¹; moreover, the obstacle can be transitory, with the spontaneous migration of the stones in the duodenum². The diagnosis of acute biliary pancreatitis is almost always possible on the basis of clinical, laboratoristic and instrumental data. The severity of the pathology is established by means of

multifactorial scores (Ranson, Glasgow, APACHE II), at the time of admission, in the first 48/72 hours and subsequently by means of imaging (Balthazar and CTSI).

Many authors agree that, in addition to the common therapeutic measures, severe acute biliary pancreatitis requires an urgent ERCP with endoscopic sphincterotomy (ES), also in the absence of cholangitis³⁻⁶. On the contrary, the therapeutic role of ERCP/ES is reserved only for cases with documented papillary obstacle (odditis, stones, etc.) in the course of mild/moderate acute biliary pancreatitis⁴⁻⁸. It is, in fact, now unanimously accepted that ERCP must be used only for therapeutic purposes because this invasive procedure is not free from major complications⁹.

In the last decades the absence of imaging techniques such as nuclear magnetic resonance (NMR), with a high sensibility and specificity for bilio-pancreatic diseases has increased the number of ERCP with diagnostic aims only. The lithiasic disease of the principal biliary duct, with clinical, laboratoristic and instrumental (abdominal

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US) diagnosis, represents an indication for therapeutic ERCP/ES. On the contrary, in patients with mild/moderate acute biliary pancreatitis, without an increase of cholestasis indexes, and in the absence of a dilation of the intra and extra-hepatic biliary ducts, it is useful to know if obstacles are present in the PBD. On the contrary, patients with mild/moderate acute biliary pancreatitis, without an increase of cholestasis indexes and in the absence of a dilation of the intra and extrahepatic biliary ducts, should be submitted to an MRCP to determine the conditions of the principal biliary duct before the cholecystectomy. In these cases, in fact, the extensive use of MRCP, can be useful for a significant reduction of the number of non-therapeutic ERCP/ES and their associated complications.

The aim of this study is, therefore, to evaluate the role of MRCP in the diagnosis of lithiasis of the principal biliary duct without clinical, laboratoristic and instrumental signs of cholestasis in patients with mild/moderate acute biliary pancreatitis.

Materials and methods

In the period January 2003 – September 2008, forty-seven patients with mild acute biliary pancreatitis (Glasgow score = 1) were studied; the diagnosis of acute biliary pancreatitis was made on the basis of the clinical symptoms (nausea, vomiting and epigastric pain referred to the back), the laboratory data (almost twice the normal increase of the serum lipase and pancreatic amylase) and the instrumental data for the confirmation of the biliary etiology (gallstones on the abdominal US). The series of patients studied is composed of 28 females and 19 males with a mean age of 58 (age range 32/77). The laboratoristic and instrumental data are shown in table I. All the patients were submitted to an MRCP. The technical instrumental specifications follow.

All the patients were submitted to MRCP imaging using a 1.5-T Superconducting unit (Philips) with a standard circularly polarized (receive only) oval spine coil. To identify the CBD, scout images were obtained using a half-Fourier single-shot turbo spin echo (HASTE) in three orthogonal planes, followed by T2-HR-weighted images in the axial plane and other images in the coronal plane called TE-80 single-shot (5-mm thickness, gap 5 mm) in a breathhold of 10 s. These bright bile T2-weighted images detect the ductal stones as intraductal filling defects independent of composition.

During their stay in hospital, all the patients were submitted to cholecystectomy: 42 with a laparoscopic access (89.4%) and 5 with laparotomic access (10.6%) because of previous sovramesocolic surgical interventions. The clinical course, the laboratory data, the diameter of the PBD and the eventual presence of lithiasic material on the abdominal US were observed at 30 and 60 days from the surgical intervention.

Results

MRCP was diagnostic for choledocholithiasis in 13 patients (27.6%) that were submitted to an ERCP/ES. In all the 13 treated cases there was radiologic and endoscopic confirmation of the presence of stones/sand/sludge in the principal biliary duct with a complete clearance. There was no significant morbidity following the ERCP/ES; after a mean period of 2 days (range 1-5 days) from the ERCP/ES, all the 13 patients were submitted to a cholecystectomy, but the 34 patients with a negative MRCP for stones in the PBD, were operated within an average of 5 days (range 4-10 days) from admission. The post-operative morbidity of all the patients was insignificant (2 wound infections in patients submitted to a VLC). In all 47 patients MRCP has not found anatomic anomaly in the biliary tree. In all patients MRCP has been made in the same hospital stay in mean 7 days from onset of the pancreatitis. In the patients with stones of PBD in 5 we have found little stones (mean diameter 3 mm), in 8 only biliary sludge. The cleaning of PBD has been made at the same time of ERCP/ES by Dornia basket. All the patients were discharged within an average of 7 days of admission (range 6-12 days).

There was, among 34 patients with negative MRCP for stones, only one false negative: on 10st days after cholecystectomy the patient had recurrent ABP treated with the ERCP/ES and cleaning of PBD.

At 30 and 60 days from the surgical intervention all the patients were submitted to a clinical, hematochemical and abdominal US control (Tab. 2-3). No patients had a relapse of the acute pancreatitis, and hematochemical values of cholestasis indexes and pancreatic enzymes were normal. All the patients showed a maximum PBD diameter of less than 12 mm without endoluminal pathologic images.

Discussion

The incidence of gallstones in the population of western countries is about 15%, and among them about 10-15% have choledocholithiasis^{10,11}. The literature data shows that a very variable range (45-75% of the patients with acute biliary pancreatitis are carriers of stones in the PBD)¹²⁻¹⁷. The cases with acute biliary pancreatitis include mild self-limiting forms with a transient papillary obstacle not accompanied by clinical, laboratoristic and instrumental signs of cholestasis.

For these mild forms of acute pancreatitis the use of invasive procedures to explore the PBD is not advisable, while it is necessary to demonstrate the absence of stones in the PBD. The instrumental exploration of the principal biliary duct is indicated in cases of cholangitis or jaundice.

The invasive instrumental techniques for the exploration

TABLE I - Period January 2003 September 2008: 47 patients Mild acute biliary pancreatitis (Glasgow's Prognostic Score < 1) F/M: 28/19 - Mean age 58 years (range 32-77 years). Laboratory, instrumental data in mean (with range)

Direct bilirubin	0.23 (range 0.1-0.5) mg/dL
Gamma-GT	50 (range 28-57) U/L
Alkaline Phosphatase	112 (range 78-282) U/L
AST	29 (range 22-57) U/L
ALT	31 (range 25-64) U/L
Lipase	1791 (range 832-5490) U/L
Pancreatic Amylase	912 (range 588-2410) U/L
PBD size on abdominal US	< 12 millimetres
Abdominal US detection of PBD stones	

TABLE II - Thirteen patients operated on VLC / open cholecystectomy after a positive MRCP for choledocholithiasis and after the execution of an ERCP/ES Follow-up: 30th-60th day (mean of 2 controls)

Direct Bilirubin	0.17 (range 0.1-0.3)
Gamma-GT	52 (range 31-64)
Lipase	165 (range 120-221)
Pancreatic Amylase	47 (range 34-72)
Alkaline Phosphatase	115 (range 67-220)
PBD size on abdominal US	< 12 millimetres
Abdominal US detection of PBD stone	

Table III - Thirty four patients operated on VLC / open cholecystectomy after a negative MRCP for choledocholithiasis. False negative: 1 patient with recurrent ABP on 10th post-op days. Follow-up at 30-60 postoperative day (mean of 2 controls)

Direct Bilirubin	0.21 (range 0.1-0.4)
Gamma-GT	48 (range 28-71)
Lipase	184 (range 132-230)
Pancreatic Amylase	42 (range 31-68)
Alkaline Phosphatase	110 (range 72-185)
PBD size on abdominal US	< 12 millimetres
Abdominal US detection of PBD stones	

and the contextual treatment of choledocholithiasis used today are ERCP with ES and intraoperative cholangiography with the extraction of stones by transcystic or choledochotomy procedures.

The necessity to submit the patients with mild acute biliary pancreatitis to another preoperative examination to verify the absence of stones in the principal biliary duct was based on the awareness that in a significant percentage of cases (45-75%)¹²⁻¹⁷ they are present, even silently, without alteration of the cholestasis indexes, in a non dilated PBD with a diameter up to 12 mm. In our opinion, the need to utilize pre or intra-operative invasive techniques for the exploration of a non-dilated PBD in the course of mild acute biliary pancreatitis, could present some risks.

The treatment program for mild acute biliary pancreatitis, with non-dilated PBD, proposed in this study, involves submitting all the patients to an MRCP before cholecystectomy, assuming that small silent gallstones may be present in the PBD. The MRCP is a relatively recent instrumental technique in the diagnosis of biliary-pancreatic diseases; in addition to the definition of the morphology of the gallbladder and the pancreas, it permits the lithiasis of the principal biliary duct to be demonstrated with a high sensitivity (95%) and specificity (97%) and it provides an optimal representation of the biliary tree^{18,19}. The non-invasiveness of the examination, the absence of an intravenous contrast agent and of X-rays, make MRCP a non-invasive procedure which can be used extensively.

The only contraindications for the use of the MRCP are claustrophobia, morbid obesity, incapacity to have breath-hold, and the presence of electro-medical devices in the patients. Moreover, MRCP is non-operator dependent, while US and ERCP/ES are significantly operator dependent²¹. Although our case study is based on a small sample, the utilization of MRCP before cholecystectomy in patients with mild/moderate acute biliary pancreatitis permitted the diagnosis of choledocholithiasis in 13/47 patients (27.6%) and their submission to the endoscopic removal (ERCP/ES) of the stones with precision and safety; on the contrary, 72.4% of the patients (34/47) were directly submitted to cholecystectomy, avoiding ERCP/ES, which is therefore utilized only for therapeutic purpose. In this experience we had only one false negative among patients with negative MRCP. As an invasive technique, ERCP/ES, in fact, presents an immediate and long-term morbidity linked to significant, though rare, complications, such as hemorrhage (1.4%), cholangitis (1.3%), post-ERCP pancreatitis (3.5%) and duodenal perforation (0.6%)⁹.

In the course of mild/moderate acute biliary pancreatitis, the incidence of choledocholithiasis is about 50%¹²⁻¹⁷. In the natural history of choledocholithiasis about one third of the stones pass spontaneously into the duodenum within 6 weeks. The supposed number of choledocholithiasis, even silent, in patients with mild acute biliary pancreatitis remains high: so this possibility cannot be ignored in the diagnostic-therapeutic program. Together with our proposal for preoperative evaluation with non invasive instrumental technique (MRCP) there are two other possibilities. The first of these is intraoperative cholangiography (with laparoscopic or open access): this has a sensitivity of 93.5%, a specificity of 84.6% and a diagnostic accuracy of 88%²², but it is a very invasive procedure with a not insignificant morbidity (13-17%), especially if we consider that these are patients with a silent clinical scenario in which the stones are present in a moderate percentage of cases (30% in our sample), above all with a normal PBD. Moreover, with the transcystic intraoperative cholangiography there is a significant number of false positives (20-25%)²³.

The second possibility is not to take any preventive action in the absence of symptoms, reserving all the diagnostic-therapeutic treatments for the cases in which the stones become symptomatic (ERCP/ES, choledocholithotomy)^{24,25}. In this scenario, MRCP is an optimal diagnostic method, because it is non-invasive and allows the acquisition of images of high quality compared to ERCP/ES, with a sensitivity and a specificity of 95% and 97% respectively¹⁸, above all in a non-dilated PBD²¹.

In our experience, MRCP seems to be the gold standard technique to be utilized in all patients with mild/moderate acute biliary pancreatitis with non-symptomatic choledochal involvement. It permits the choice of patients not to be submitted to ERCP/ES in the absence of predictive factors of choledocholithiasis (absence of biohumoral tests of cholestasis, a negative US for lithiasis of the PBD with a diameter up to 12 mm and absence of jaundice).

Conclusion

According to the proposed model, and on the basis of the results, even if on a small series of patients, MRCP is a safe, useful and relatively inexpensive method for the diagnosis of choledocholithiasis, with a very high sensitivity and specificity. We propose its routinary utilization in all patients with mild/moderate acute biliary pancreatitis, and we hope further studies will be carried out involving a greater number of patients.

Riassunto

L'importanza dell'ostruzione della papilla di Vater nella patogenesi della pancreatite acuta biliare è ampiamente riconosciuta. Lo scopo di questo studio è di valutare l'utilità della MRCP prima della colecistectomia nei pazienti con pancreatite acuta biliare di grado lieve.

Nel periodo 2003-2007, 35 pazienti (F/M: 20/15) con pancreatite biliare lieve, senza l'aumento degli indici di colestasi ed in assenza di coledocolitiasi valutata con l'ecografia addominale, sono stati sottoposti ad MRCP. Durante il follow-up di durata fra i 15 e i 60 giorni dopo la colecistectomia, sono stati valutati in tutti i pazienti la comparsa di ittero o di riacutizzazione della pancreatite acuta biliare.

In 10 pazienti, con la MRCP, è stata diagnosticata coledocolitiasi e sono stati sottoposti ad ERCP, sfinterotomia endoscopica e rimozione dei calcoli; l'MRCP ha dato esito negativo in 25 pazienti, i quali sono stati sottoposti senza ulteriori controlli a colecistectomia. Tutti i 35 pazienti sottoposti ad MRCP prima della colecistectomia non hanno avuto né ittero né riacutizzazione della pancreatite acuta biliare durante il periodo di follow-up.

L'MRCP rappresenta un accurato esame strumentale per la diagnosi preoperatoria di coledocolitiasi e costituisce

una importante procedura per selezionare, fra i pazienti con diagnosi di pancreatite acuta biliare lieve, coloro da sottoporre successivamente ad ERCP.

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