

CLINICAL CASE

RIGHT HEPATIC DUCT STENOSIS DUE TO MULTIPLE METALLIC CLIPS AFTER CHOLECYSTECTOMY. IS THERE A WAY OUT? RE-LAPAROSCOPY AND ERCP STENTING**Iulian Slavu¹, Adrian Tulin², Bogdan Socea³, Vlad Braga¹, Vasile Șandru¹, Anca Oprescu Macovei³, Lucian Alecu²**¹Bucharest Emergency Clinical Hospital, Bucharest, Romania²“Prof. Dr. Agrippa Ionescu” Emergency Clinical Hospital, Bucharest, Romania³“Saint Pantelimon” Emergency Clinical Hospital, Bucharest, Romania

Corresponding author: Tulin Adrian

E-mail: dr_2lin@yahoo.com

Abstract

Bile duct lesions with leakage and stenosis can occur after open or laparoscopic cholecystectomy. Multiple factors are involved either related to the patient or external due to technical equipment or surgeon. Bismuth classification is generally accepted. The aim is to restore the bile duct and to prevent short-term and long-term complications such as biliary fistula, intra-abdominal abscess, biliary stricture, recurrent cholangitis, and secondary biliary cirrhosis. Endoscopic therapy with biliary sphincterotomy alone or with the additional placement of a biliary/nasobiliary stent drainage is recommended. Stenting should be avoided if complete strictures exist or a circumferential resection of the duct. Endotherapy can be considered a sensible option and should be the main-stay treatment in these patients but one must keep in mind it is costly and is usually practiced by experienced teams in tertiary centers. The purpose of our paper is to exemplify this complication which is inherently rare, to highlight the diagnostic and treatment tools with minimal long-term sequelae.

Keywords: endotherapy, biliary duct stenosis, bile leakage**Introduction**

Laparoscopic cholecystectomy is the gold standard treatment for acute or chronic cholecystitis due to gallstones. In Europe, the reported incidence of gallstones is 21% with an incidence of 0.63% / year [1].

Despite these high values, there is still a growing trend regarding the diagnosis of gall bladder stones. Of these cases, 20% of them are symptomatic and lead to important morbidities and associated increased costs due to complications and the required treatment [2].

In Europe, there is no concrete evidence regarding the number of cholecystectomies performed in the whole continent in a year, but Lammert et. al reported that in Germany around 200.000 cholecystectomies are performed every year [3].

Keeping in mind this high number of cholecystectomies the rate of complications will have correlated values. The percentage of main bile duct lesions has increased from 0.1-0.2% from the era of open cholecystectomy to 0.7% in the era of laparoscopic cholecystectomy [4, 5].

With all of these in mind, laparoscopic cholecystectomy has demonstrated its superiority

in the treatment of acute or chronic cholecystitis due to rapid postoperative recovery, better cosmetic results but with all of these advantages, we have observed that there is an increase in the incidence of lesions of the main bile duct, right hepatic biliary duct and right hepatic artery. These lesions give rise to an increase the perioperative morbidity but most important is that these lesions have a chronic evolution and reduce in the long run the survival of the patient and the quality of life [6].

The results with regard to the effectiveness of the treatment of the complications are related to the date when the complication is identified with regards to the surgical intervention and the severity of the lesions. The biologic state of the patient at the moment of the surgical intervention, other pathologies, surgeon experience also has an impact on the success of the treatment. The ideal situation would be that after the complication is identified the patient is transferred to a center specialized in the treatment of hepato-biliary surgical complications but unfortunately this option is not available in all of the medical systems. The main purpose of identifying the lesions and applying the treatment is to prevent long term complications such as stenosis, cholangitis, or main bile duct fistulas. In the postoperative period if the main bile duct lesion is not large and the biliary discharge is small the period until a positive diagnosis is confirmed will increase.

Regarding the resources to treat one can use a conservative approach, surgical reintervention, or endoscopy. The order of their usage is still open for debate as there is no consensus in this regard.

Partial stenosis of the right biliary duct due to a misapplied titanium clip is rare, our personal study of the literature did not identify published cases of such lesions so the treatment is implicitly non-standardized. The stenosis of the biliary duct can appear if the clip is applied perpendicular on the axis of the duct- in this case, the lesion is frequently complete which is quickly diagnosed due to the clinical impact of the obstruction. If the clip is applied along the longitudinal axis of the duct which is the case of our patient, the obstruction is partial and diagnosis becomes more difficult.

The purpose of our paper is to exemplify this complication which is inherently rare, to

highlight the diagnostic and treatment tools with minimal long-term sequelae.

Case presentation

We present the case of a 50 years old female which was transferred to our clinic from the infectious disease hospital.

The patient was operated 7 days before presentation due acute lithiasic cholecystitis (laparoscopic cholecystectomy), the surgery progressed without problems and the patient was discharged on day 2 postop. Three days after discharge, the patient presented with diffuse abdominal pain with a preferred location in the right hypochondrium accompanied by vomiting and loss of appetite. The patient was hospitalized in the infectious diseases department with hepatic cytolysis syndrome (increased TGO and TGP), increased GGT but with total bilirubin, direct bilirubin, and indirect bilirubin within normal limits. All these paraclinical changes were associated with a febrile syndrome. Thus, the suspicion of acute hepatitis of viral origin was raised, but it was refuted after collecting the viral markers. Abdominal CT was performed which identified the right hepatic biliary duct as partially obstructed by a metal clip placed tangentially to its projection as well as a collection in the liver bed with dimensions of 10/7cm. Subsequently, the patient was transferred to our department.

Based on the imaging investigations and the refutation of the diagnosis of acute hepatitis, a surgical reintervention was decided by a laparoscopic approach with a diagnostic and therapeutic role. Intraoperatively, a collection of bilious appearance was identified in the hepatic bed, a clip applied on the right hepatic duct in the hilum was identified (Figure 1), but after the mobilization of tissues in the area, a second clip was identified, also applied on the right hepatic duct but distal to the previous one (Figure 2). Both clips were extracted laparoscopically. Postoperatively, the patient showed partial remission of painful symptoms and a cholestasis syndrome for 2 days, then starting with day 3 postoperatively, febrile episodes reappeared with high levels of GGT and transaminases. In this context, it was decided to perform an ERCP which confirmed the presence of 2 other clips

located in the hepatic hilum on the right hepatic duct, proximal to those previously extracted also placed tangentially with obstruction of approximately 50% of the duct (Figure 3 and 4). Taking into account the patient's age and long-life expectancy in order to avoid a debilitating surgery with a hepato-jejunal anastomosis in the hepatic hilum, it was chosen to place a stent in the right hepatic duct in hope of subsequent distension and repermeabilization. The subsequent evolution was favorable with the remission of cytotoxic syndrome. The patient was discharged 4 days after the procedure without symptoms. The 1-month reevaluation by ultrasound did not identify any noticeable changes. TGO, TGP, GGT, and bilirubin also remained within normal limits.



Figure 1 – Clip applied on the right hepatic duct in the hilum was identified at reintervention

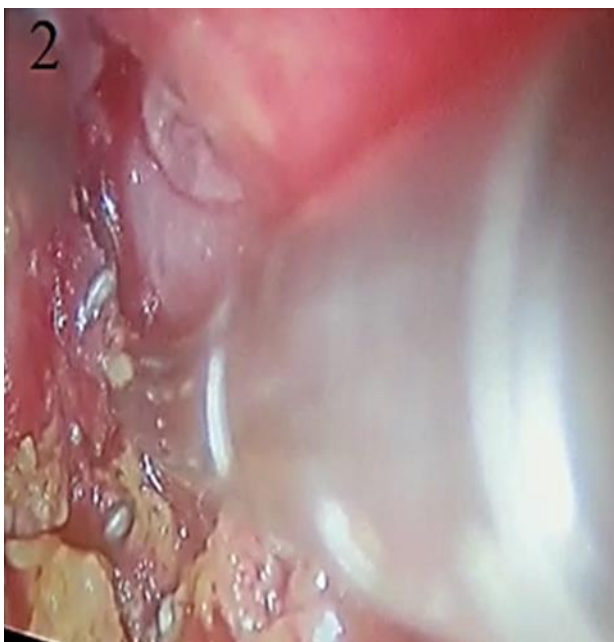


Figure 2 – A second clip was identified at reintervention, also applied on the right hepatic duct but distal to the previous one

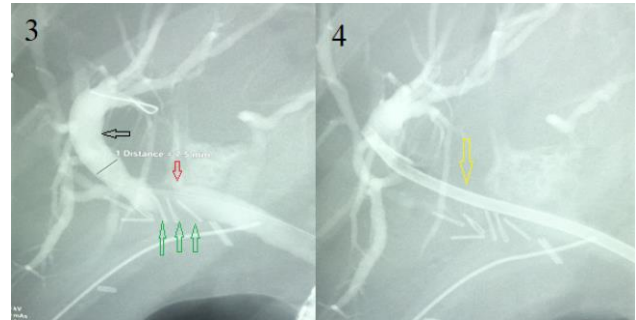


Figure 3 and 4 – ERCP images confirmed the presence of 2 other clips located in the hepatic hilum on the right hepatic duct, proximal to those previously extracted also placed tangentially with obstruction of approximately 50% of the duct. In figure no. 3 one can observe the stenosis (red arrow) with subsequent dilation of the biliary duct (black arrow) and the multiple clips applied on the duct (green arrows). Figure no. 4 also shows the stent after placement (yellow arrow).

Discussions

Biliary complications after cholecystectomy can echo many years after surgery and can negatively impact the patient's quality of life. Lau WY highlighted the fact that only 30% of complications are identified intraoperatively at the time of occurrence [7].

Unfortunately, our patient did not fit in that 30%. The possibility of causing an injury to the right hepatic duct during cholecystectomy occurs by applying metal clips either perpendicular to the axis of the hepatic duct - a situation that results in a complete obstruction or tangential application which produces an incomplete obstruction and implicit has a smaller clinical resonance. Also, the main bile duct can be obstructed at the moment of the cystic ligation due to traction. In the presented case, multiple tangential clips were applied on the right hepatic duct - intraoperatively during the first surgical intervention – the laparoscopic cholecystectomy, there was a hemorrhagic incident that reduced visibility and made it difficult to recognize the hilar structures that most likely led to accidental clipping of the extrahepatic bile ducts.

There are two reasons why these lesions occur. There is no recognition of the anatomical landmarks and the right hepatic duct was clipped

and sectioned by confusion with the cystic duct (not the case) because the cyst was clearly identified. Another situation is the existence of an aberrant hepatic duct which is confused with the cystic duct. A third situation must be mentioned - intraoperative incidents such as hemorrhages that cause an alteration of the local area with changes in local anatomy, loss of anatomical landmarks, and under the pressure of time and hemorrhage one can place the clips on the biliary ducts.

The applied treatment is dictated entirely by the type of lesion produced to the biliary tract but also by its location. The type of lesion can be confirmed by non-invasive methods such as cholangitis-MRI

These iatrogenic lesions require complex, multidisciplinary treatment and the people in the team must speak the same language in terms of the type and severity of the lesion. There are many classifications of iatrogenic main bile duct lesions at present, thus denoting a lack of agreement in characterizing them. The most cited is the Bismuth classification, but in our case, the lesion could not meet these criteria. This classification becomes useful after high biliary reconstructions with intrahilary localization. The Strasbourg classification is useful because it cumulates the vision of the gastroenterologist and the general surgeon on the pathology. According to this, our lesion is the type D – lateral lesions of the main hepatic ducts. Another more modern classification focused on lesions produced by laparoscopic clips is Neuhaus – in our case, it is a type B1 lesion (main hepatic duct lesion - incomplete stenosis by clipping).

The lesions at the level of the main bile ducts present with obstructive jaundice, respectively biliary fistula. The symptoms of these two surgical complications, however, are not separate and often overlap, especially in the immediate postoperative period. Predominant, however, are the lesions that produce biliary fistulas. Bile duct stenoses appear late after the healing process, arising from thermal lesions following dissection in the Calot trigone and less often through the application of clips. The strictures produced by healing after a thermal injury can show the first symptoms even two months after production and are generally related to obstructive jaundice [8].

In the case of our patient, we noticed that the latency in developing obstructive complications

did not apply, so the symptoms appeared quickly and were centered on a hepatic condition that associates cytolysis but without an increase in indirect bilirubin (characteristic of posthepatic stenosis) after only 7 days, due to this the clinician can be quickly misled (as was our case - first it was considered viral hepatitis)

Regarding the therapeutic options, at the moment there are many, especially imagistic ones, but they need a high index of suspicion in order to use them effectively. Also, there is no exact line is drawn regarding the order in which these resources are used. The most on hand is the abdominal ultrasound, it is cheap, fast, non-radiant but it has a big minus because it is operator dependent. In the case of our patient, the utility was limited in identifying the distension of the right hepatic duct, but it could not certify the existence of the clips so from our point of view the cholangio-MRI should be the mainstay investigation in the case of biliary lesions.

Conclusion

In conclusion, in our case-ERCP with subsequent stenting was an effective treatment option for a patient with right hepatic duct stenosis due to a roque applied clip. The other option was resection with a high hepato-jejunal anastomosis, a risky intervention with multiple postoperative complications.

References

- [1] Angelico F, Del-Ben M, Barbato A et al. Ten-year incidence and natural history of gallstone disease in a rural population of women in central Italy. *GREPCO. Ital J Gastroenterol* 1997; 29: 249-254.
- [2] Diehl AK, Rosenthal M, Hazuda H et al. Socioeconomic status and the prevalence of clinical gallbladder disease. *J Chron Dis* 1985; 38:1019-1026.
- [3] Lammert F, Neubrand MW, Bittner R et al. S3-guidelines for diagnosis and treatment of gallstones. German Society for Digestive and Metabolic Diseases and German Society for Surgery of the Alimentary Tract. *Z Gastroenterol* 2007; 45: 971-1001.
- [4] Flum DR, Cheadle A, Prella C, Dellinger EP, Chan L. Bile duct injury during cholecystectomy and survival in medicare beneficiaries. *JAMA* 2003;290: 2168-73.

- [5] Lai EC, Lau WY. Mirizzi syndrome: History, present and future development. *ANZ J Surg* 2006;76: 251-7.
- [6] Connor S, Garden OJ: Bile duct injury in the era of laparoscopic cholecystectomy. *Br J Surg* 2006; 93: 158– 168.
- [7] Lau WY, Lai EC. Classification of iatrogenic bile duct injury. *Hepatobiliary Pancreat Dis Int* 2007; 6: 459-63.
- [8] Elhamel A, Nagmuish S, Elfaidi S, Ben Dalal H. Handling of biliary complications following laparoscopic cholecystectomy in the setting of Tripoli Central Hospital. *HPB (Oxford)* 2002; 4: 105-10.