Clip Migration in Common Bile Duct: An Uncommon Complication of Laparoscopic Cholecystectomy

Pradhan U, Gyawali P, Dahal R, Joshi Lakhey P

Department of GI and General Surgery

Tribhuvan University Teaching Hospital,

Maharajgunj, Kathmandu, Nepal.

Corresponding Author

Umesh Pradhan

Department of GI and General Surgery

Tribhuvan University Teaching Hospital,

Maharajgunj, Kathmandu, Nepal.

E-mail: meshpradhan@gmail.com

Citation

Pradhan U, Gyawali P, Dahal R, Joshi Lakhey P. Clip Migration in Common Bile Duct: An Uncommon Complication of Laparoscopic Cholecystectomy. *Kathmandu Univ Med J.* 2022;77(1):111-3.

ABSTRACT

Laparoscopic cholecystectomy is the gold standard procedure for symptomatic cholelithiasis. During the procedure the cystic duct is ligated with titanium clips. Migration of these clips after cholecystectomy is a rare complication and may result in stone formation in common bile duct (CBD). We are here discussing a case of a 29 years female who presented with choledocholithiasis 10 years after laparoscopic cholecystectomy. The clip was incidentally discovered during endoscopic retrograde cholangiopancreatography (ERCP) and stone extraction. The patient was managed successfully at our center.

KEY WORDS

Clip migration, Endoscopic retrograde cholangiopancreatography, Laparoscopic cholecystectomy

INTRODUCTION

Gallstones are the most common biliary pathology. Majority of the cases of gallstones are asymptomatic and are recognized as an incidental finding, however during an interval of 10 to 15 years approximately 15% to 25% will become symptomatic.[1] Laparoscopic cholecystectomy (LC) has largely replaced the conventional open cholecystectomy and has become the gold standard for the treatment of symptomatic gallstone disease.[2] Despite being widely practiced, LC still has higher complication rate reported to be around 5% which is more than that of open cholecystectomy.[3-6]

Among various complications, surgical clip migration with resultant stone formation into CBD is recognized as a rare complication.[7,8] With the introduction of LC, reported case of post cholecystectomy clip migration (PCCM) in literature peaked in the period of 1994-1998 which also coincided with the higher complication rates of LC reported at that period and was credited to the learning curve for this procedure.[9,10]

CASE REPORT

Twenty nine years female presented with abdominal pain on and off for six weeks. Abdominal pain was located at the right upper quadrant and was moderate in intensity, non-radiating, aggravated by fatty food intake and relieved spontaneously. It was also associated with one episode of vomiting which was non-projectile, non-bilious and containing food particles. There was no history of fever, jaundice, loss of appetite, itching, high colored urine, clay colored stool, melena or loss of weight. She had undergone laparoscopic cholecystectomy 10 years back. On examination the abdomen was soft, mildly tender at the right upper quadrant with no organomegaly.

Laboratory investigations showed WBC 4,400/cmm, total bilirubin 16 µmol/L (3 to 21 µmol/L) and direct bilirubin 3 µmol/L (4 µmol/L), ALT 223 U/L (5 to 45 U/L), AST 84 U/L (5 to 40 U/L), ALP 597 (< 306 U/L), GGT 207 U/L (< 50 U/L), albumin 39 g/L, PT 12 seconds, INR 1.09. USG abdomen showed mildly dilated CBD measuring 11 mm

in diameter with suspected multiple stones in its distal aspects with post cholecystectomy status. MRCP showed moderately dilated CBD measuring 13 mm with two well-defined hypointense filling defect in distal part measuring approximately 8.5x4 mm and 5x6 mm in size; feature suggestive of choledocholithiasis. Both right and left IHBR were mildly dilated.

On admission the patient was managed symptomatically with intravenous fluids and analgesics. With the diagnosis of primary choledocholithiasis status post LC, therapeutic ERCP sphincterotomy and basket removal of stone was planned. After selective cannulation of CBD and instillation of contrast, multiple filling defects with a linear hyperdense structure resembling a clip was demonstrated in one of the defects. During ERCP, CBD stone along with a clip was extracted (fig. 1 and 2). There were no periprocedural complications. She improved symptomatically with the normalization of liver function tests after ERCP. She was discharged two days after ERCP.

Figure 1. Endoscopic image of a extracted stone formed over a surgical clip

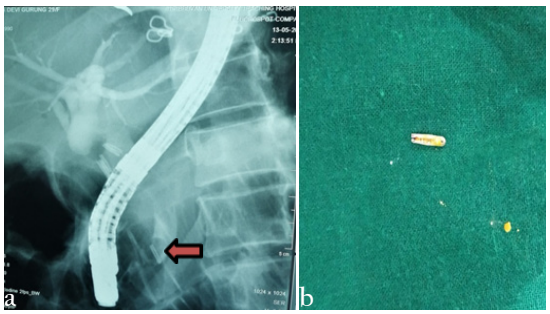

Figure 2. (a) ERCP image showing filling defect with clip inside it (arrow). (b) Extracted titanium clip with embedded stone debris.

DISCUSSION

After cholecystectomy CBD stone may occur in upto 10% of cases. Majority of the stones are formed de novo, while few occur as a part of complication of surgery.[11] After cholecystectomy complications like bile duct injury, bleeding and wound infection occurs early while biliary strictures and PCCM occurs late.[12,13] As reported PCCM can also result in other complications such as duodenal ulcer and clip embolism.[10,14,15] A review of 69 cases of PCCM reported the median time of presentation of symptoms related to PCCM after cholecystectomies to be 26 months (range, 11 days to 20 years). The median number of clips used during LC was 6 (range, 2 to 14). The median number of clips migrated into CBD was 1 (range, 1 to 6).[7]

The exact pathological process causing migration of clips is unknown. Cystic duct stump necrosis could be a possible initial event. The pressure exerted from intra-abdominal organs movement, ischemia and infective complication might attribute to such event.[16] The circumstances associated with PCCM include bile duct injuries along with incorrect clip placement, biloma formation due to bile leakage and local suppurative inflammatory process.[17] Placement of too many clips during surgery is also one of the important factors. PCCM had been shown to be associated where more than six clips were used during surgery.[12]

Complicated gallstone disease accounted for 23.2% of cases with PCCM with resultant biliary complication. This might be attributed to acute inflammatory setting with adhesion and inflammation that will distort the normal anatomy thus increasing the risk for injuries.[7]

Demographic variable like age and sex of PCCM seems to be similar to that of gall stone disease, being more common in female and older age group. Clinical presentations of PCCM related biliary complications were similar to choledocholithiasis. PCCM related biliary complication is differentiated from post cholecystectomy primary CBD stones with the help of imaging modalities.[7]

In the past even though case reports of PCCM peaked, recently it is in a declining trend probably because of better training programs subjected to the surgeon. In the period of 2004 to 2008, there were only 13 cases reported in 12 publications.[15,20-22] Operative factors like placement of too many clips and application of clips in close proximity to the cystic duct/CBD junction may result in a greater risk of subsequent clip migration. ERCP has emerged as modality of choice for the treatment of PCCM, while surgery or percutaneous transhepatic cholangiography (PTC), is reserved in case of difficult biliary stricture or large stones.[18,19] Adequate endoscopic sphincterotomy facilitates the spontaneous passage of stones even after initial failed ERCP extraction of stones. Overall, ERCP had a success rate of 84.5% for managing PCCM.[7]

REFERENCES

1. Shabanzadeh DM, Sorensen LT, Jorgensen T: A prediction rule for risk stratification of incidentally discovered gallstones: Results from a large cohort study. *Gastroenterology.* 2016;150:156-67.
2. Ellison EC, Carey LC. Cholecystectomy, cholecystostomy, and intraoperative evaluation of the biliary tree. In Baker JR, Fishcer JE (2001). Mastery of Surgery. Philadelphia: Lippincott Williams & Wilkins.
3. Buanes T, Mjaland O. Complications in laparoscopic and open cholecystectomy: A prospective comparative trial. *Surg Laparosc Endosc*. 1996;6:266–72.
4. Lee VS, Chari RS, Cucchiaro G, Meyers WC. Complications of laparoscopic cholecystectomy. *Am J Surg.* 1993;165:527–32.
5. Williams LF Jr, ChapmanWC, Bonau RA, McGee EC Jr, Boyd RW, Jacobs JK. Comparison of laparoscopic cholecystectomy with open cholecystectomy in a single center. *Am J Surg.* 1993;165:459–65.
6. Ammann K, Kiesenebner J, Gadenstatter M, Mathis G, Stoss F. Embolism of a metallic clip: An unusual complication following laparoscopic cholecystectomy. *Dig Surg.* 2000;17:542–4.
7. Chong VH, Chong CF: Biliary complications secondary to post-cholecystectomy clip migration: A review of 69 cases. *J Gastrointest Surg.* 2010;14:688–96
8. Krishn Kant Rawal. Migration of Surgical Clips into the Common Bile Duct after Laparoscopic Cholecystectomy. *Case Rep Gastroenterol.* 2016;10:787–92
9. Walker WE, Avant GR, Reynolds VH. Cholangitis with a silver lining. *Arch Surg.* 1979;114:214–5.
10. Ghazanfari K, Gollapudi PR, Konicek FJ, Olivera A Jr, Madayag M, Warner J. Surgical clip as a nidus for common bile duct stone formation and successful endoscopic therapy. *Gastrointest Endosc.* 1992;38:611–3.
11. Qiang L, Liang T, Xingyu W, Lingjun M, Xitai S, Jianxin Z: Bile duct stone formation around a prolene suture after cholangioenterostomy. *Pak J Med Sci.* 2016;32:263–6.
12. Brutvan FM, Kampschroer BH, Parker HW. Vessel clip as a nidus for formation of common bile duct stone. *Gastrointest Endosc.* 1982;28:222–3.
13. Margolis J. Recurrent choledocholithiasis due to hemostatic clip. *Arch Surg.* 1986;121:1213.
14. Matsuura T, Kanisawa Y, Sato T, Saito T, Hirata K. Migration of endo clip into common bile duct after laparoscopic cholecystectomy. *Lancet*. 1992;340:306.
15. Raoul JL, Bretagne JF, Siproudhis L, Heresbach D, Campion JP, Gosselin M. Cystic duct clip migration into the common bile duct: A complication of laparoscopic cholecystectomy treated by endoscopic biliary sphincterotomy. *Gastrointest Endosc.* 1992;38:608–11.
16. Kitamura K, Yamaguchi T, Nakatani H, Ichikawa D, Shimotsuma M, Yamane T. Why do cystic duct clips migrate into the common bile duct? *Lancet.* 1995;346:965–966.
17. Farr CM, Larson C, Gladen HE, Witherspoon L, Lesperance R, Moseley D. An iatrogenic gallstone with pancreatitis. *J Clin Gastroenterol.* 1989;11:596–7.
18. Sato T, Denno R, Yuyama Y, Matsuura T, Kanisawa Y, Hirata K. Unusual complications caused by endo-clip migration following a laparoscopic cholecystectomy: Report of a case. *Surg Today.* 1994;24:360–2.
19. Youssef AI, Chang AC, Chen YK. Surgical clip as a nidus for choledocholithiasis: successful endoscopic management. *Am J Gastroenterol*. 1994;89:2280–1.
20. Dhalla SS, Duncan AW. Endoscopic removal of a common-bile-duct stone associated with a Ligaclip. *Can J Surg.* 1992;35:344–5.
21. Arnaud JP, Bergamaschi R. Migration and slipping of metal clips after celioscopic cholecystectomy. *Surg Laparosc Endosc.* 1993;3:487–9.
22. Mansvelt B, Harb J, Farkas B, Mourou M, Huguet C.Clip-stone" filiation within the biliary tract. *HPB Surg.* 1993;6:185–8.