Laparoscopic retrieval of impacted and broken dormia basket using a novel approach

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Abstract

We encountered a 73-year-old patient who presented with right upper abdominal pain and jaundice. On evaluation, he was found to have cholelithiasis with choledocholithiasis. Endoscopic retrograde cholangiography was attempted, but during the procedure, the wire snapped and the dormia basket got retained in the common bile duct (CBD). Laparoscopic CBD exploration was performed and the basket with calculus was found impacted in the lower CBD. The basket was disengaged by holding its tip through another dormia introduced through cholangioscope and basket with all calculi retrieved. Clearance of CBD was ascertained with cholangioscopy and CBD was closed primarily. He did well in the post-operative period and was discharged on the 5th post-operative day. At 1-year follow-up, the patient was doing well. Laparoscopic CBD exploration is a feasible and safe option for the retained dormia basket. We utilised the ‘dormia with dormia technique’ to retrieve the impacted basket which has not been reported before.

Keywords: Broken, cholangioscope, dormia basket, impacted, laparoscopic

INTRODUCTION

Cholelithiasis is a commonly encountered problem and endoscopic retrograde cholangiography (ERC) is the first-line option with more than 80% retrieval rate with the standard technique.² Although it is minimally invasive with a high success rate, it is not free of complications. Retention of dormia basket in the common bile duct (CBD) is a known, although rare, complication of ERC stone removal. This could be due to the impaction of basket in the presence of a large stone or breakage of the wire during cranking. As impacted dormia is associated with further problems, its prompt removal is necessary.² There are various endoscopic manoeuvres to remove it, but when these fail, choledochotomy either through laparotomy or laparoscopic method is the only option available. Here, we present a novel method of laparoscopic removal of retained dormia basket using another dormia.

CASE REPORT

A 73-year-old male patient presented with complaints of pain in the right upper abdomen for 3 months, which was dull aching in nature and relieved with medication, only to recur again. He also noticed gradually progressive jaundice with cholestatic features and low-grade fever for 5 days. On examination, he was icteric, and on abdominal examination, there was no abnormality.
Biochemical investigation revealed elevated serum bilirubin (2.17 mg/dl) and alkaline phosphatase (630 IU/L). Ultrasound evaluation showed cholelithiasis with choledocholithiasis causing dilatation of biliary tree till intrahepatic biliary radicals. He underwent ERC, but during the procedure, while pulling the dormia basket with engaged stones, dormia basket got impacted at the ampulla and wires snapped close to handle [Figure 1a]. Then, he was referred to our centre for further management. A contrast-enhanced computed tomography scan was performed which showed retained dormia basket with a dilated biliary system with no other injury [Figure 1b-d].

In view of cholangitis with an impacted basket, he was taken up for emergency surgery and laparoscopic cholecystectomy with CBD exploration was planned. Longitudinal choledochotomy was performed in the supraduodenal part of the CBD, and choledochoscopy was performed through the epigastric port which showed a dormia basket with impacted stone in the lower CBD. The initial attempt to remove it with laparoscopic grasper was not successful. Then, another dormia basket was introduced through the choledochoscope and the tip of the broken dormia was engaged in it and pulled out of the CBD [Figure 2a-d]. Impacted dormia basket with its broken wire along with all CBD stones delivered out. The basket along with stones was placed in an endobag and brought out through the epigastric port. Check choledochoscopy ascertained clearance of the bile duct both distally as well as proximally. CBD was then closed primarily with interrupted 3-0 polyglactin and the procedure was completed by performing cholecystectomy.

His post-operative period was uneventful and shifted to the ward. He was allowed orally on the 2nd post-operative day (POD) and his abdominal drain was removed on the 3rd POD and discharged on the 5th POD. At the end of 1-year follow-up, he was doing well with a normal liver function test.

**DISCUSSION**

ERC has been the standard for care in the management of choledocholithiasis. However, it is associated with complications such as pancreatitis (5%), haemorrhage (2%), infections (2.3%) and perforation of duodenum or bile duct (1%–2%).[3] Although very rare, the impaction of dormia basket or snapping of its wire is a known complication that reportedly ranges from 0.3% to 0.8%.[2‑4] This may be due to either impaction of a large stone in basket or fracture of wire which can occur at an extra- or intra-corporeal level. The impacted basket can be associated with many complications such as cholangitis and pancreatitis; hence, early removal of the impacted dormia is essential.[2] However, there is no consensus on the optimal technique for its removal.

The retained basket has been retrieved by a variety of strategies such as extracorporeal shock wave lithotripsy (ESWL), sphincterotomy and balloon dilatation, rescue mechanical lithotripter, exchange of metal wires or metal sheaths or choledochotomy – either via laparotomy or laparoscopic approach.[5,6] ESWL utilises laser lithotripsy to fragment the stones that further aid in retrieving the impacted dormia. However, this needs
Surgical management of impacted dormia basket has the advantage of being a one-time procedure permitting the performance of cholecystectomy at the same time. Yilmaz et al. published their experience of open surgical removal of impacted dormia basket in six patients. They found that large stone size (>2 cm) was associated with risk of basket impaction. However, open exploration is associated with significant pain and prolonged recovery. Hence, laparoscopic retrieval of dormia basket was attempted in this case. It has been reported before only thrice which makes our procedure only the fourth such in the literature. Our dormia with dormia technique is novel and has not been reported before.

Sahoo et al. removed the impacted basket through laparoscopic choledochotomy with the help of Maryland forceps as they could visualize the dormia. Another surgeon who attempted laparoscopic removal of basket and stone was using balloon through choledochotomy. In our case, as we could not see the basket or stone as it was impacted near ampulla, we, therefore, modified our approach. Choledochoscopy was performed, impacted dormia basket was visualised, another dormia basket was introduced through it and the tip of broken dormia was engaged in its basket, and then, it was gradually pulled out of choledochotomy site. Along with it, all the calculi were also removed and check choledochoscopy was done to confirm the clearance of stones. Hence, we termed this procedure as ‘dormia with dormia’ technique to remove the broken dormia. This retrieval technique allows the safe removal of the basket under vision and avoids further damage to the CBD or duodenum, as it disimpacts and moves the basket in the more dilated proximal CBD rather than through the ampulla. Further, it ensures complete clearance of all CBD calculi with the use of choledochoscope and allows simultaneous cholecystectomy and identification of other injuries to the bile duct or duodenum and is better than open surgery in terms of less pain, reduced hospital stay and superior cosmesis.

Hence, to conclude, though dormia basket impaction is an unusual complication of ERCP stone clearance, many options are available for its retrieval including endoscopy, open surgery and by laparoscopy. We found that laparoscopic ‘dormia with dormia technique’ of retrieving impacted dormia basket is safe, feasible and less morbid procedure in well-selected cases.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

REFERENCES

1. Carr- Locke DL. Therapeutic role of ERCP in the management of suspected common bile duct stones. Gastrointest Endosc 2002;56:S170-4.
2. Yilmaz S, Erson O, Ozkececi T, Turel KS, Kokulu S, Kacar E, et al. Results of the open surgery after endoscopic basket impaction during ERCP procedure. World J Gastrointest Surg 2015;7:15-20.
3. Karstielos P, Lazaraki G, Chatzimavroudis G, Gkagkalis S, Vasiliadis I, Papaetsihiou A, et al. Risk factors for therapeutic ERCP-related complications: An analysis of 2,715 cases performed by a single endoscopist. Ann Gastroenterol 2014;27:65-72.
4. Schreurs WH, Juttmann JR, Stuibbergen WN, Oostvogel HJ, van Vroonhoven TJ. Management of common bile duct stones: Selective endoscopic retrograde cholangiography and endoscopic sphincterotomy: Short and long-term results. Surg Endosc 2002;16:1068-72.
5. Ranjeev P, Kohl KL. Retrieval of an impacted Dormia basket and stone in situ using a novel method. Gastrointest Endosc 2000;51:504-6.
6. O’Brien JW, Tyler R, Shaukat S, Harris AM. Laparoscopic common bile duct exploration for retrieval of impacted Dormia basket following endoscopic retrograde cholangiopancreatography with mechanical failure: Case report with literature review. Case Rep Surg 2017;2017:5878614.
7. Ainslie W, Reed J, Larvin M, McMahon MJ. Successful laparoscopic rescue of an impacted lithotripter basket from the common bile duct. Endoscopy 2000;32:S34.
8. Sahoo MR, Kumar S, Ahammed PS. Laparoscopic retrieval of impacted Dormia basket. J Minim Access Surg 2017;13:237-9.