



INTRODUCTION

- Retrieval baskets are a common device used in the extraction of biliary stones during endoscopic retrograde cholangiopancreatography (ERCP)
- Basket impaction, can occur if a basket captures a stone that is too large to remove with traction and the basket/stone complex cannot be separated
- To manage this complication, specialized baskets have been developed with a break-away tip
- In this case, we describe failure of tip disengagement of an impacted Trapezoid retrieval basket (Boston Scientific, Marlborough, MA) with a novel rescue technique

CASE DESCRIPTION

- A 43-year-old with a past medical history of obesity, breast cancer in remission, and choledocholithiasis requiring multiple ERCP attempts with incomplete stone removal, presented for repeat ERCP
- She initially presented 8 months prior with elevated transaminases (ALT 246 U/L, AST 68 U/L), alkaline phosphatase (166 U/L), total bilirubin (6.7 mg/dL), and imaging revealed two large common bile duct (CBD) stones
- In the subsequent months, she underwent multiple repeat ERCPs with mechanical lithotripsy (ML), electrohydraulic lithotripsy (EHL) and stent exchange
- During her third ERCP, intra-procedure cholangiogram demonstrated a narrow CBD with upstream dilation, multiple filling defects, and one large stone
- Multiple balloon sweeps failed to clear the duct, and a digital cholangioscope was used to perform EHL on the distal-most stone
- While performing basket sweeps of the distal stone fragments, the large stone was captured and became impacted in the mid-CBD (Image 1)
- ML was unable to fragment the stone and the fail-safe tip failed to disengage

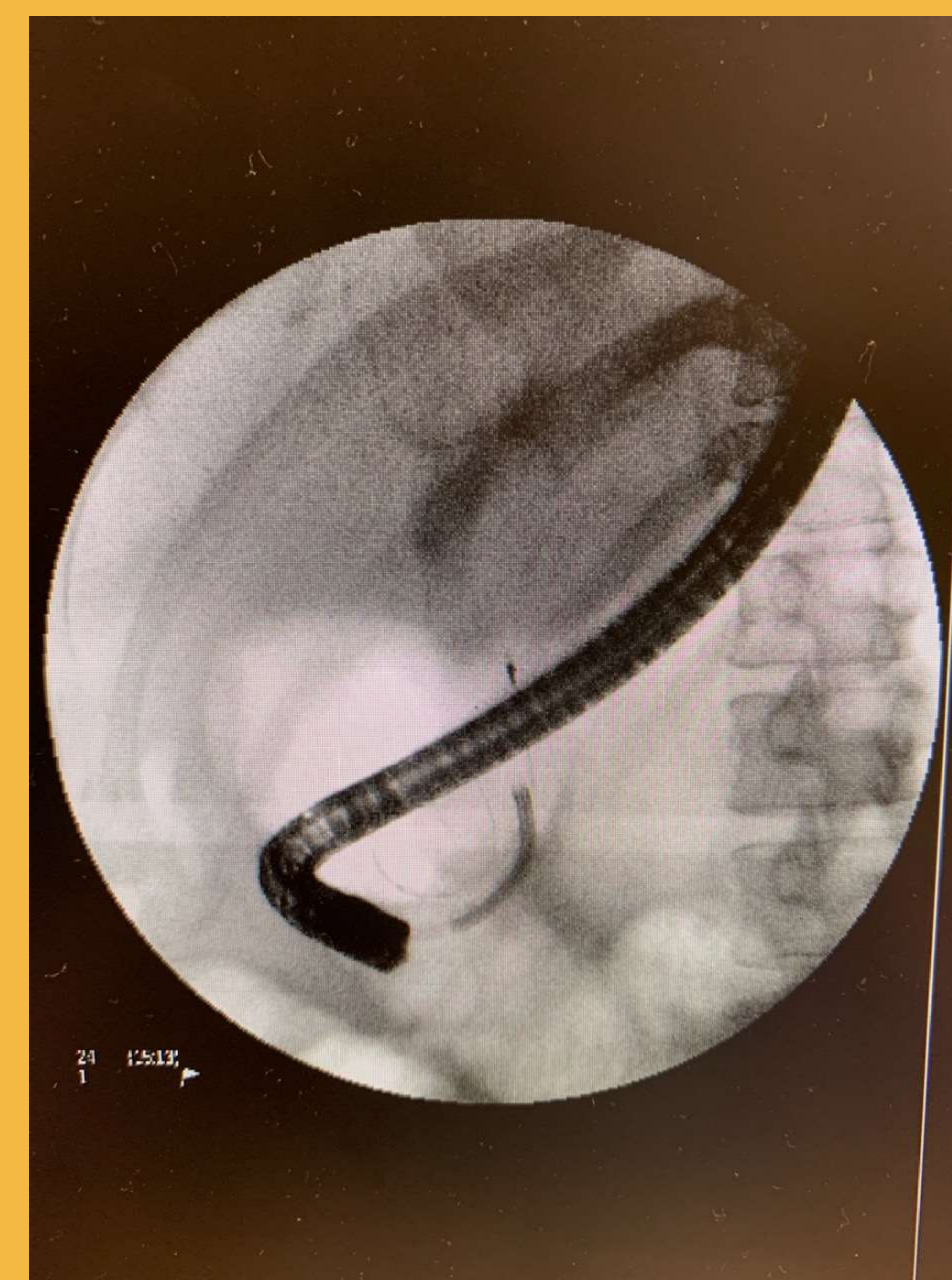
CASE DESCRIPTION (CONT.)

- During the ML attempt, the basket handle snapped with the basket and stone impacted in the CBD
- The basket wires near the handle were cut to remove the scope, which was then removed entirely and reinserted beside the wires
- A cholangioscope was then introduced alongside the wires and extensive EHL eventually fractured the impacted stone and basket (Image 2)
- After additional stone removal, two plastic biliary stents were placed. Final cholangiogram demonstrated residual medium-sized stone fragments and an overall 70% decrease in stone burden
- The patient underwent repeat ERCP in one month with stent removal and definitive clearance of the stones

Image 1: Impacted Basket and Stone in CBD



Image 2: Cholangioscopy for EHL and Basket Removal



DISCUSSION

- Retrieval basket impactions, while rare, are medical emergencies that require prompt attention and ingenuity
- In most cases, extra-endoscopic ML and/or a break-away tip mechanism can alleviate basket impactions
- In this case, these fail-safe mechanisms both failed, which has not yet been reported in existing literature
- In the event of ML failure, alternative options for other basket types have included retrieval with a balloon catheter, use of a second ML basket to capture the first, or extracorporeal shock-wave lithotripsy
- In the event of prior reports of break-away tip failure, argon plasma coagulation and manipulation of severed wires has demonstrated success
- Our approach using cholangioscopy with EHL alongside the basket wires provides another potential therapeutic option

CONCLUSIONS

- In the face of failed ML and Trapezoid basket break-away mechanisms, we describe a treatment approach comprised of cholangioscopy with EHL to fracture the stone and allow for basket removal
- Our approach provides a framework for how to approach this challenging and potentially life-threatening complication

REFERENCES

- Adler DG, Conway JD, Farraye FA, Kantsevov SV, Kaul V, Kethu SR, Kwon RS, Mamula P, Pedrosa MC, Rodriguez SA, Tierney WM. Biliary and pancreatic stone extraction devices. *Gastrointestinal endoscopy*. 2009 Oct 1;70(4):603-9.
- Chavalitdhamrong D, Donepudi S, Pu L, Draganov PV. Uncommon and rarely reported adverse events of endoscopic retrograde cholangiopancreatography. *Digestive Endoscopy*. 2014 Jan;26(1):15-22.
- Schutz SM, Chinae C, Friedrichs P. Successful endoscopic removal of a severed, impacted Dormia basket. *American Journal of Gastroenterology (Springer Nature)*. 1997 Apr 1;92(4).
- Katsinelos P, Germanidis G, Chatzimavroudis G, Pilpilidis I, Zavos C, Kountouras J. Biliary sphincter dilation: a novel approach for management of a biliary basket impaction. *Endoscopy*. 2008 Nov;40(11):958-.
- Maple JT, Baron TH. Biliary-basket impaction complicated by in vivo traction-wire fracture: report of a novel management approach. *Gastrointestinal Endoscopy*. 2006 Dec 1;64(6):1031-3.
- Mutignani M, Gabbriellini A, Murali N, Perri V, Costamagna G. Novel methods of management of trapped dormia baskets in the pancreatic and biliary ducts. *Endoscopy*. 1997 Feb;29(02):129-30.
- Caluag MC, Ho KY. Successful endoscopic retrieval of an impacted trapezoid basket with severed traction wires. *Endoscopy*. 2005 Apr;37(04):407-.
- Purohit T, Garg M, Kulkarni A, Thakkar S. Argon plasma coagulation for extraction of an impacted Trapezoid basket in the pancreatic duct. *ACG Case Reports Journal*. 2015 Apr;2(3):139.