

Case Report

Bouveret syndrome: two approaches one stone

Vysheki Satchithanandha, Ngee-Soon Lau, Ana Galevska, Charbel Sandroussi

Royal Prince Alfred Hospital, 50, Missendon Road, Camperdown, NSW 2050, Australia

*Corresponding author. Royal Prince Alfred Hospital, 50, Missendon Road, Camperdown, NSW 2050, Australia. E-mail: vysheki.s@gmail.com

Abstract

Bouveret syndrome is a rare cause of gastric outlet obstruction, a consequence of a large impacted gallstone leading to the formation of a bilioenteric fistula. We present a case of a 79-year-old female who presented with a history of persistent nausea and vomiting. Computed tomography of the abdomen revealed a large gallstone impacted in the second part of the duodenum, complicated by a cholecystoduodenal fistula, leading to gastric outlet obstruction. After nasogastric decompression, the patient underwent an upper gastrointestinal endoscopy and attempted stone retrieval which was unsuccessful. Consequently, she underwent laparotomy, gastrotomy, and extraction of the stone. This case highlights the pitfalls of managing Bouveret syndrome via an endoscopic or an open surgical approach.

Keywords: Bouveret syndrome; gallstone ileus

Introduction

Bouveret syndrome is a cause of gastric outlet obstruction, a direct complication of bilioenteric fistula formation in the proximal duodenum or pylorus, secondary to a large impacted gallstone. It is the cause of 1%–3% of all cases of gallstone ileus and primarily affects 74-year-old females [1], with stones >2.5 cm. The treatment involves endoscopic removal of the stone or various lithotripsy techniques, which can lead to complications such as distal enteric obstruction from stone fragmentation [2]. The optimal surgical approach remains a subject of ongoing debate with some advocating for enterolithotomy alone, particularly in older populations with significant comorbidities, as the necessity for a definitive biliary procedure is low. Moreover, considering the presence of a patent cystic duct, the likelihood of spontaneous fistula closure is high. We report a case of Bouveret syndrome during which lithotripsy was avoided, and a surgical approach was undertaken after a failed initial endoscopic attempt.

Case report

A 79-year-old female presented with a 5-day history of nausea, vomiting, and abdominal discomfort but no overt pain. She was hemodynamically stable. On examination, she had mild right upper quadrant tenderness but no signs of peritonism and a negative Murphy's sign. Computed tomography (CT) of the abdomen and pelvis revealed features suggestive of acute cholecystitis, complicated by cholecystoduodenal fistula with a large (3.5 cm) gallstone impacted at the second part of the duodenum (Figs 1 and 2), consistent with Bouveret syndrome. The patient was kept fasting and a nasogastric tube was inserted for gastric



Figure 1. Coronal CT image of abdomen demonstrating fistulous connection between the gallbladder and duodenum and a large gallstone.

decompression. She underwent a gastroscopy in an attempt to remove the impacted gallstone. However, the stone could not be retrieved due to its severe impaction, most evident on the pylorus side of the duodenum (Fig. 3).

Given the unsuccessful endoscopic attempt, the decision was made to relieve the gastric outlet obstruction surgically. The

Received: August 30, 2023. Accepted: September 21, 2023

Published by Oxford University Press and JSCR Publishing Ltd. © The Author(s) 2023.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

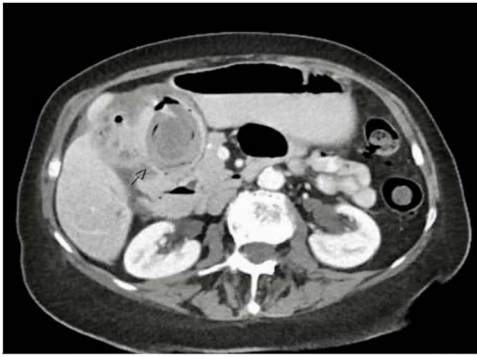


Figure 2. Axial CT image of abdomen demonstrating a fistulous connection between the gallbladder and duodenum and a large gallstone.



Figure 3. Large gallstone in pylorus side of the duodenum on endoscopy causing complete obstruction.

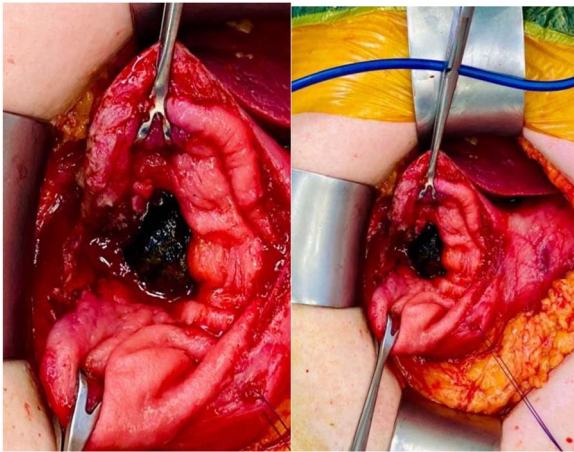


Figure 4. Mini laparotomy, gastrotomy, and extraction of large impacted gallstone causing gastric outlet obstruction.

patient underwent a mini laparotomy, gastrotomy, and extraction of gallstone (Fig. 4). The fistula was visualized communicating to the bile duct, and all stone fragments were retrieved through a longitudinal gastrotomy (Fig. 5). The gastrotomy was repaired with 4–0 polydioxanone (PDS), and an omentopexy was performed. The patient made an unremarkable recovery and was discharged home after 10 days.

Discussion

Bouveret syndrome remains a topic of debate, in regard to its management. This case demonstrates the success of a surgical approach after initial endoscopic attempts were unfruitful. The decision to opt for direct surgical intervention over lithotripsy exemplifies the intricate clinical choices surgeons must navigate when deliberating between minimally invasive and open surgical methods.

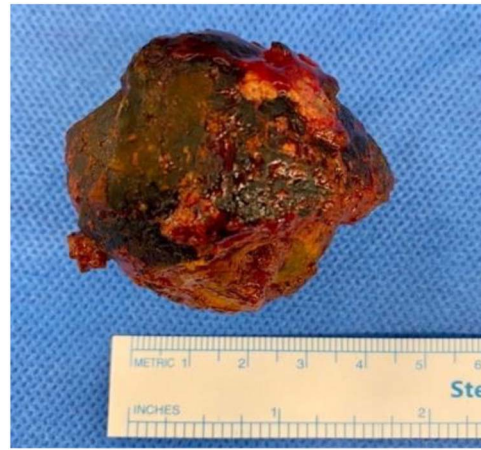


Figure 5. Large gallstone retrieved during laparotomy measuring up to 4 cm in diameter.

Endoscopy and lithotripsy modalities are preferred due to their lower mortality and morbidity rates compared with surgery (1.6%–17.3%) [3]. However, endoscopic intervention has a lower success rate compared with surgical intervention (43%–94.1%) [4]. Endoscopic management frequently requires adjuncts due to complexities involved. Endoscopy alone is most effective with smaller stones (<2–3 cm) [5], as complete closure of cholecystoduodenal or cholecystogastric fistulas via endoscopy is not the norm. Furthermore it is often unnecessary [6] due to the spontaneous closure of fistulas.

Larger calcified stones (>2–3 cm) becomes challenging for endoscopic retrieval, prompting the use of lithotripsy to disintegrate the stone. However, the drawback of electrohydraulic lithotripsy lies in its potential to inadvertently focus shock waves on the intestinal wall, resulting in bleeding and perforation [7]. Laser lithotripsy offers precise energy targeting the stone with minimal tissue damage [8]. However, a significant complication of laser includes iatrogenic distal gallstone ileus due to stone fragments [9, 10]. Recent evidence shows that less than two-thirds of published cases have been successfully treated via lithotripsy [11].

Surgery has demonstrated higher success rates in the past; however, it is associated with significant morbidity (37.5%) and mortality (11%) [12]. Surgical options encompass open gastrotomy, pylorotomy, or duodenotomy, especially when endoscopy proves ineffective. These choices are employed when stones can be manoeuvred to a favourable location for extraction. In instances where open surgery encounters challenges accessing stone-impacted areas, endoscopy serves as an adjunct to reposition the stone to be more accessible for an enterotomy.

The management of Bouveret syndrome remains a personalized process of the patient's unique circumstances. As medical advancements continue to unfold, it may further refine the approach to this rare condition.

Conflict of interest statement

None declared.

Funding

None declared.

References

1. Cappell MS, Davis M. Characterization of Bouveret's syndrome: a comprehensive review of 128 cases. *Am J Gastroenterol* 2006;**101**: 2139–46.
2. Wang F, Du ZQ, Chen YL, et al. Bouveret syndrome: a case report. *World J Clin Cases* 2019;**7**:4144–9.
3. Dumonceau JM, Devière J. Novel treatment options for Bouveret's syndrome: a comprehensive review of 61 cases of successful endoscopic treatment. *Expert Rev Gastroenterol Hepatol* 2016;**10**:1245–55.
4. Ong J, Swift C, Stokell BG, et al. Bouveret syndrome: a systematic review of endoscopic therapy and a novel predictive tool to aid in management. *J Clin Gastroenterol* 2020;**54**: 758–68.
5. Caldwell KM, Lee SJ, Leggett PL, et al. Bouveret syndrome: current management strategies. *Clin Exp Gastroenterol* 2018;**11**: 69–75.
6. Alsolaiman MM, Reitz C, Nawras AT, et al. Bouveret's syndrome complicated by distal gallstone ileus after laser lithotripsy using holmium: YAG laser. *BMC Gastroenterol* 2002;**2**: 15.
7. Binmoeller KF, Brückner M, Thonke F, Soehendra N. Treatment of difficult bile duct stones using mechanical, electrohydraulic and extracorporeal shock wave lithotripsy. *Endoscopy* 1993;**25**: 201–6.
8. Lv S, Fang Z, Wang A, et al. Choledochoscopic holmium laser lithotripsy for difficult bile duct stones. *J Laparoendosc Adv Surg Tech A* 2017;**27**:24–7.
9. Dumonceau JM, Delhaye M, Devière J, et al. Endoscopic treatment of gastric outlet obstruction caused by a gallstone (Bouveret's syndrome) after extracorporeal shock-wave lithotripsy. *Endoscopy* 1997;**29**:319–21.
10. Reinhardt SW, Jin LX, Pitt SC, et al. Bouveret's syndrome complicated by classic gallstone ileus: progression of disease or iatrogenic? *J Gastrointest Surg* 2013;**17**:2020–4.
11. Hendriks S, Verseveld MM, Boevé ER, Roomer R. Successful endoscopic treatment of a large impacted gallstone in the duodenum using laser lithotripsy, Bouveret's syndrome: a case report. *World J Gastroenterol* 2020;**26**:2458–63.
12. Pavlidis TE, Atmatzidis KS, Papaziogas BT, Papaziogas TB. Management of gallstone ileus. *J Hepatobiliary Pancreat Surg* 2003;**10**: 299–302.