ORIGINAL RESEARCH PAPER

General Surgery

OPERATING AGAINST THE CURVE : TECHNICAL AND POSITIONING CHALLENGES DURING CHOLECYSTECTOMY IN A SEVERE KYPHOTIC PATIENT – A CASE REPORT

KEY WORDS: Kyphosis, gall stone disease, laparoscopic cholecystectomy

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ABSTRACT

Background: Gallstone disease is most often managed with laparoscopic cholecystectomy. However, patients with severe spinal deformities, particularly kyphosis, present unique anatomical challenges that may hinder safe laparoscopic access, occasionally necessitating conversion to an open approach. **Case Summary:** We report the case of a 65-year-old woman with advanced kyphosis who presented with symptomatic gallstones. Initial laparoscopic intervention was attempted, but distorted abdominal anatomy and restricted working space led to poor visualization. The procedure was converted to open surgery, and an open cholecystostomy was performed due to dense adhesions and difficulty in achieving critical dissection landmarks. **Conclusion:** Spinal deformities such as kyphosis can significantly complicate minimally invasive surgery. Preoperative assessment and readiness for conversion are crucial. In complex scenarios, open cholecystostomy remains a safe and effective alternative.

INTRODUCTION

Cholelithiasis is a prevalent condition commonly treated with laparoscopic cholecystectomy. This minimally invasive approach has become the preferred surgical method due to its reduced postoperative discomfort, shorter hospitalization, and quicker recovery. However, in patients with significant anatomical abnormalities like kyphosis, the altered intra-abdominal orientation and limited peritoneal volume can complicate laparoscopic procedures. Kyphosis, which is a deformity of the spine caused by ageing and longstanding osteoporosis, results in various surgical difficulties for laparoscopic cholecystectomy due to low lying costal arches, such as a small abdominal working space, disturbance of the surgical view and decreased controllability of the surgical instrument. Severe kyphosis, often associated with vertebral degeneration or longstanding osteoporosis, causes anterior displacement and crowding of abdominal organs, making trocar placement and safe dissection more difficult.

This case highlights a rare but clinically significant scenario wherein severe spinal curvature influenced both surgical access and decision-making, ultimately resulting in conversion to open surgery and performance of a cholecystostomy.

Case Report

We herein report the case of a 65-year-old woman with severe kyphoscoliosis presented with intermittent right upper quadrant abdominal pain lasting several months. The pain episodes were colicky, occasionally associated with nausea, but without fever, jaundice, or gastrointestinal bleeding. She had no prior history of abdominal surgery. Her medical history was notable for advanced thoracolumbar kyphosis resulting from osteoporotic vertebral compression.

Physical examination revealed a short-statured woman with severe forward spinal curvature and limited ability to lie supine. Abdominal palpation showed mild tenderness in the right hypochondrium without signs of peritonitis. Her blood work, including liver and pancreatic enzymes, was within normal limits. Xray of spine revealing severe concavity angle at thoracolumbar body [Figure 1]. Abdominal ultrasound showed a contracted gallbladder with multiple calculi but no evidence of acute cholecystitis or biliary obstruction.

Figure 1 showing severe kyphotic spine

After preoperative optimization, laparoscopic cholecystectomy was scheduled as literature suggested that laparoscopic cholecystectomy with port position modification was gold standard in kyphotic patients [Figure 2]. Intraoperatively, significant difficulty was encountered in establishing pneumoperitoneum due to anterior abdominal wall deformity and reduced peritoneal cavity volume. The altered organ orientation and limited scope mobility prevented proper visualization of Calot's triangle, and dissection was deemed unsafe. The procedure was converted to an open right subcostal approach.

Fig 2 showing position of patient at ot table with restricted flexed knee joint .

On exploration, the gallbladder was shrunken, fibrotic, and densely adherent to the surrounding omentum and duodenum. Due to the chronic inflammation and inability to safely identify critical anatomical landmarks, a cholecystostomy was performed, and a T-tube was placed for external drainage. The patient had an uneventful postoperative recovery and was discharged on the sixth postoperative day. A follow-up T-tube cholangiogram showed patent biliary ducts without obstruction, and the tube was subsequently removed.

Review of Literature

While laparoscopic cholecystectomy remains the gold standard for treating gallstone disease, spinal deformities such as kyphosis and scoliosis significantly complicate its execution. The altered topography of the abdominal cavity limits pneumoperitoneum efficiency and disrupts the anatomical view, particularly of the hepatobiliary triangle [1,2].

Several reports have documented higher conversion rates to open surgery in patients with significant spinal curvature due to restricted working space and disoriented anatomy [3]. In such patients, open cholecystectomy, or in select high-risk cases, cholecystostomy, is considered a safe alternative [4]. Cholecystostomy, although rarely performed in the current

laparoscopic era, remains relevant in scenarios where complete cholecystectomy is unsafe due to dense adhesions or anatomical obscurity [5].

DISCUSSION

The presence of severe kyphosis poses both diagnostic and therapeutic challenges during laparoscopic abdominal surgery. The spinal curvature shifts abdominal organs anteriorly and reduces the vertical dimension of the peritoneal cavity, limiting both insufflation and instrument triangulation. In this case, despite adherence to standard laparoscopic protocols, visualization of critical anatomy was insufficient, and continuing laparoscopically would have increased the risk of bile duct injury.

Prompt intraoperative conversion allowed safer management. Although complete cholecystectomy is the definitive treatment, in this scenario, cholecystostomy was a safer option. The decision to perform a cholecystostomy should be guided by the surgeon's assessment of operative risk versus benefit, especially in patients with distorted anatomy or chronic inflammation.

This case underscores the importance of anticipating surgical challenges in patients with spinal deformities. Preoperative imaging with cross-sectional modalities such as CT scans can provide valuable insight into organ positioning and help guide surgical planning.

CONCLUSION

Severe kyphosis can significantly alter abdominal anatomy, making laparoscopic procedures technically demanding and potentially unsafe. Surgeons should maintain a low threshold for open conversion in such patients. In complex cases where anatomy is obscured or dissection is hazardous, cholecystostomy remains a viable and safe option. Individualized surgical planning, including detailed preoperative imaging, is essential for optimizing outcomes in these anatomically challenging scenarios.

REFERENCES (Vancouver Style)

1. Zhang WJ, Liu YB, Wu GZ, et al. Management of cholelithiasis in patients with severe kyphosis: A case series. Surg Laparosc Endosc Percutan Tech. 2008;18(2):176–179.
2. Kim HH, Park HY, Lee KH. Laparoscopic cholecystectomy in a patient with kyphoscoliosis: A case report. J Korean Surg Soc. 2011;81(Suppl 1):S43–S46.
3. Quillin RC, Sweeney JF. Conversion of laparoscopic to open cholecystectomy: an analysis of risk factors. Am Surg. 2003;69(12):1061–1063.
4. Targarona EM, Balague C, Knook MM, et al. Laparoscopic surgery and surgical risk in the elderly patient. Best Pract Res Clin Gastroenterol. 2001;15(6):947–959.
5. Macintyre IM, Wilson RG, Nixon SJ, et al. Cholecystostomy: a valid option in high-risk patients with gallbladder disease. Br J Surg. 1991;78(11):1372–1373.