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Surgical versus Non-Surgical Intervention for Cholelithiasis

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Abstract

Upon successful completion of an Objective Structured Clinical Examination (OSCE) and oral defense, a literature review was performed based upon the case presented in the OSCE. The topic that was chosen was surgical versus non-surgical management of cholelithiasis in adults. A literature review was conducted through databases including PubMed and Clinical Key. The key words used include “cholelithiasis”, “cholecystectomy”, “surgical intervention”, “non-surgical intervention”, and “management”. The search was limited to English only, full-text, past 5 years, systematic reviews, meta-analysis, and randomized controlled trials. Various additional sources were reviewed such as UpToDate and the Society of American Gastrointestinal and Endoscopic Surgeons.

Current guidelines for cholelithiasis management recommend cholecystectomy with symptomatic patients, whereas asymptomatic patients with cholelithiasis warrant watchful waiting. There is also the patient population that may have symptomatic cholelithiasis and need a cholecystectomy, although they may not be surgical candidates. For these patients there are other options. The quality of life for an individual may be affected despite surgical or non-surgical intervention for cholelithiasis

Background

Cholelithiasis is a common problem in the United States. Many people live with gallstones and experience no symptoms, but there are many who become symptomatic and seek treatment. According to Afdhal and Zakko (2018), in the United States, an estimated 6.3 million men and 14.2 million women aged 20 to 74 have gallstones or have undergone cholecystectomy for gallbladder disease. Cholecystectomy is the recommended treatment for symptomatic gallbladder disease. Patients who have abdominal pain, also known as biliary colic and gallstones on imaging, cholecystectomy is recommended rather than expectant management. These patients are likely to have recurrent attacks of biliary colic and are at risk for complications. In patients who have a single episode of biliary colic without complications and wish to avoid surgery, expectant management may be a reasonable alternative. The patient must understand that postponing surgery may allow complications to develop.

A cholecystectomy poses a risk to any patient. These risks include infection, perforation, bleeding, and even death (Afdhal and Vollmer, 2020). The immediate post-operative course for patients may involve discomforts such as pain, nausea, and vomiting. The later effects of a cholecystectomy may cause people to have gastrointestinal discomforts such as inability to tolerate high-fat food and large meals, nausea, vomiting, and diarrhea life-long.

Through a literature review, we will explore if surgical versus non-surgical management of cholelithiasis affects quality of life for an adult patient with cholelithiasis. A case study will be presented that exemplifies classic symptoms for cholecystitis.

Case Report

Chief Complaint: Abdominal Pain

History of Present Illness: A 47-year- old female patient presents to the clinic with complaints of abdominal pain. After her evening meal the night before, she began to have sharp, right upper quadrant pain with nausea and vomiting. The pain radiated to the right mid back. She had similar episodes in the past, but never sought medical care. Since her episode last evening, she has been able to drink fluids and keep them down.

Review of Systems:

General: Negative for weight loss/gain, fever, chills, fatigue.

Skin: Negative for rash and itching.

HEENT: Negative for headache, visual changes, hearing changes, sore throat, nasal drainage, or neck masses.

Respiratory: Negative for cough or SOB.

Cardiovascular: Negative for palpitations, arrhythmia, or edema.

Gastrointestinal: Positive for pain, nausea and vomiting. Denies change in bowel habits.

GU: Negative for frequency, urgency, nocturia. Denies hematuria or flank pain.

Neuro: Negative for headache, dizziness, or lightheadedness.

Past Medical History: None

Past Surgical History: None

Social History:1-2 drinks of wine weekly

Medications: None

Allergies: None

Physical Exam:

Vital Signs: Temp: 99.5°F **BP:** 116/70 **HR:** 102 **Resp:** 20 **BMI:** 30 kg/m^2

Constitutional: Oriented to person, place, and time. She appears to be in no distress.

HEENT: Head normo- cephalic and atraumatic. Uvula is midline and oropharynx is clear and moist. Normal dentition. Pupils are equal, round and reactive to light and accommodation.

Neck: Supple.

Cardiovascular: Normal rate, regular rhythm, normal heart sounds and intact distal pulses. No edema.

Respiratory: Effort normal. No respiratory distress. Lung sounds clear bilaterally.

Abdominal: Soft. Bowel Sounds are normal. Tenderness to right upper and right lower quadrant upon palpation. Positive Murphy's sign.

Skin: Pink, warm, and dry, no lesions.

Neuro: Cranial Nerves 2-12 intact.

Psychiatric: She has a normal mood and affect.

Differential Diagnosis:

Cholecystitis

Biliary Pancreatitis

Choledocholithiasis

Labs/Imaging:

1. CBC, BMP, Amylase and Lipase drawn. Increased alkaline phosphatase, increased GGT, increased total and direct bilirubin, and elevated leukocytes.
2. An abdominal ultrasound was obtained and revealed cholecystitis

Assessment and Plan:

Patient has cholecystitis. A referral to surgery was placed for gallbladder removal. Patient encouraged to maintain a low-fat diet and drink plenty of fluids in the interim. If symptoms worsen, or unable to keep any fluids down, patient encouraged to visit the emergency department.

Literature Review

Surgical Intervention

According to the Society of American Gastrointestinal and Endoscopic Surgeons, the indications for gallbladder surgery have remained unchanged since 1992 (Overby, Apelgren, Richardson, and Fanelli, 2010). According to Overby, et al. (2010), The National Institute of Health (NIH) agrees that most patients with symptomatic gallstones are candidates for gallbladder surgery, if they have no serious underlying co-morbidities and can tolerate anesthesia. Gallbladder surgery is indicated when patients present with symptomatic cholelithiasis, biliary dyskinesia, acute cholecystitis, and pancreatitis. If a patient has cholelithiasis and is asymptomatic, surgery is not indicated. These are national guidelines that have been followed by surgeons for almost 30 years and give medical professionals strong evidence that cholecystectomy is the recommended plan for symptomatic cholelithiasis.

Certain circumstances can put a patient at a higher risk for having to undergo a cholecystectomy. Gallbladder (GB) sludge is defined as “a suspension of cholesterol monohydrate crystals or calcium bilirubinate granules mixed with mucin and proteins” (Lee, Kang, Hwang, Kim, and Hwang, 2015, p.594). The clinical significance of biliary sludge is related to cholelithiasis. A retrospective cohort study of patients who presented with typical

biliary pain showed that the likelihood of biliary events in patients with GB sludge over the course of 5 years was significantly higher (Lee et al., 2015). This study is limited in that it is a retrospective study, although the results show us that GB sludge can predispose patients to biliary events that could lead to cholecystectomy.

Acute Biliary Pancreatitis is a complication associated with cholecystitis. A randomized prospective study looked at early versus delayed cholecystectomy in patients with mild to moderate Acute Biliary Pancreatitis (ABP). This study looked at criteria such as recurrent biliary events, peri-operative complications, conversion rate, length of surgery, and total hospital length of stay between two groups. The results of this study found that there were no significant peri-operative complications, conversion rate to open surgery, and duration of surgery performed in patients who had a cholecystectomy with symptomatic cholelithiasis. On the other spectrum, the rate of recurrent biliary events was found in the delayed group, and the hospital length of stay was longer in the delayed group (Jee, Jarmin, Lim, and Raman, 2018). With the results of this study, it is safe to say that cholecystectomy can prevent further complication associated with cholelithiasis

Risks

Most invasive surgery comes with a risk. According to Afdhal and Vollmer (2020), risks that can occur during a cholecystectomy include bile duct injury, bile leaks, bleeding, and bowel injury. These complications can also be related to the type of patient selected for the cholecystectomy, underlying medical conditions of the patient, experience of the surgeon, and surgical approach.

In addition to the risks described earlier, Ciaula, Garruti, Wang, and Portincasa, (2018) claim that gallbladder removal may cause abnormal metabolic consequences such as alterations

in glucose, insulin, lipid and lipoprotein levels, liver steatosis, and the metabolic syndrome. These reports are due to alterations in the mechanisms involved in the transportation of bile acids.

Non-Surgical Intervention

Asymptomatic cholelithiasis involves expectant management. For those people who have symptomatic cholelithiasis and need a cholecystectomy and are not surgical candidates, other options exist. According to Zakko (2018), the options for non-surgical gallstone removal are oral dissolution therapy with bile acids, percutaneous cholecystostomy, and stone extraction. Extracorporeal shock wave lithotripsy is also an option, but this treatment is rarely used.

A retrospective review presented by Baron and Grimm (2015), looked at the outcomes of patients with both calculous and acalculous cholecystitis who were deemed not to be fit for surgery and instead underwent percutaneous and endoscopic (transpapillary or transmural) drainage. During the years 2011 to 2013, 73 patients were treated: 43 with percutaneous drainage and 30 with endoscopic drainage (24 transpapillary, 6 transmurally). The conclusion this study came to was that there were differences in the endoscopically treated patients in terms of resolution of cholecystitis, need for reintervention, mean pain scores, adverse events, and hospital length of stay.

Jansse, Hendriks, Natroshvili, and Bremers (2019) carried out a retrospective study looking at conservative management of cholecystitis by evaluating the effect of antibiotic agents, with or without gallbladder drainage in patients unfit for surgery. Patients were divided into three groups: those treated with antibiotic agents, those who received antibiotic agents in combination with percutaneous gallbladder drainage, and those whose treatment was only symptomatic. The conclusion was that cholecystitis can be treated with antibiotics, drainage, and pain medications,

although these treatments are a bridge to surgery (Jansse, Hendriks, Natroshvili, & Bremers, 2019). Surgery will mostly likely be necessary due to complications of gallbladder disease.

A multicenter, randomized, parallel-arm, non-inferiority study in 24 academic and non-academic hospitals in the Netherlands sought to compare the non-inferiority of a restrictive strategy with stepwise selection with usual care to assess (in)efficient use of cholecystectomy. The enrolled patients were aged 18-95, had abdominal pain, and gallstones or sludge found on abdominal ultrasound. For the restrictive strategy, five criteria were looked at in patients whom cholecystectomy was recommended. These criteria are: 1) severe pain attacks, 2) pain lasting 15–30 min or longer, 3) pain located in epigastrium or right upper quadrant, 4) pain radiating to the back, and 5) a positive pain response to simple analgesics. The findings in this study concluded that the restrictive strategy reduced cholecystectomies by 7.7% compared with usual care. The authors also conclude that current surgical treatment of patients with gallstones and abdominal symptoms is far from optimal and is not improved by implementing a more restrictive selection for cholecystectomy (Dijk, Wennmacker, Reuver, Latenstein, Buyne, Donkervoort, and Van Laarhoven, 2019). The findings in this study give physicians a reason to rethink the option of a cholecystectomy.

Quality of Life

The quality of life in an individual with cholelithiasis or one who had a cholecystectomy can be affected. The role of the gallbladder is to store bile and when the gallbladder is removed, patients may question how the body maintains itself after the gallbladder is removal. According to Feldman, Friedman, and Brandt (2016), the removal of the gallbladder alters daily biliary secretions, although not substantially. During a fasting state, bile acid may pool in the small

intestine and this may cause diarrhea. Diarrhea is a common symptom experienced after a cholecystectomy (Feldman, Friedman, & Brandt, 2016). In the context of quality of life, having to deal with diarrhea on a regular basis is not a pleasant outcome

A cholecystectomy can be performed either open or laparoscopically. A randomized controlled clinical trial sought to explore whether single-incision laparoscopic cholecystectomy, with the somewhat larger incision at the umbilicus, may lead to a worse postoperative quality of life, and more pain compared with the more classic 4-port laparoscopic cholecystectomy. The conclusion this study came to was that quality of life after a cholecystectomy did not differ considerably between single-incision laparoscopic cholecystectomy and 4-port laparoscopic cholecystectomy (Ito, Takai, and Takada, 2018).

In the context of the risks involved with a cholecystectomy, Loozen, Oor, Ramshorst, Santvoort, and Boerma, (2016) performed a study to examine the short and long-term outcomes of conservative treatment of patients with acute calculous cholecystitis. Conservative treatment was successful in 87% of patients with acute calculous cholecystitis and in 96% of patients with mild disease. In the long term, 22% of the patients developed recurrent gallstone-related disease. The authors concluded that conservative treatment of acute calculous cholecystitis seems reasonable and safe, especially in patients with mild disease (Loozen et al., 2016). During long-term follow-up of the participants, less than a quarter of the patients appeared to develop recurrent gallstone-related disease (Loozen et al., 2016).

Prevention

In terms of gallstone prevention, physical activity has been recommended for the prevention of gallstones. A systematic review examined how acute and chronic exercise

influenced gallbladder disease. Conclusions from this study reported that “physical activity seems likely to reduce the risk of both gallstones and gallbladder cancer” (Shephard, 2015).

Learning Points

- Cholecystectomy is the preferred treatment for acute cholecystitis for symptomatic cholelithiasis.
- Expectant management is the preferred treatment for asymptomatic cholelithiasis.
- Studies show that cholelithiasis can progress to cholecystitis and even more serious complications.
- Gallbladder sludge is a precursor to biliary events.
- A cholecystectomy may cause life-long gastrointestinal discomforts.
- Cholecystitis can be managed non-surgically with treatments such as oral dissolution therapy with bile acids, percutaneous cholecystostomy, and stone extraction.
- Physical activity is recommended for the prevention of gallstones.
- Quality of life can be altered in those individuals who have gallbladder disease due to post-cholecystectomy complications or the risk of progressing gallbladder disease.

References

Afdhal, N. H., & Zakko, S. F. (2018). Gallstones: Epidemiology, risk factors and prevention. Retrieved March 14, 2020, from https://www.uptodate.com/contents/gallstones-epidemiology-risk-factors-and-prevention

Afdhal, N. H., & Vollmer, C. M. (2020). Complications of laparoscopic cholecystectomy. Retrieved March 18, 2020, from https://www.uptodate.com/contents/complications-of-laparoscopiccholecystectomy?search=cholecystectomy&source=search_result&selectedTitle=2~150&usage_type=default&display_rank=2#H21

Baron, T. H., & Grimm, I. S. (2015). Nonsurgical management of cholecystitis: a tailored approach. *Gastrointestinal Endoscopy*, *82*(6), 1037–1038. doi: 10.1016/j.gie.2015.04.016

Ciaula, A. D., Garruti, G., Wang, D. Q.-H., & Portincasa, P. (2018). Cholecystectomy and risk of metabolic syndrome. *European Journal of Internal Medicine*, *53*, 3–11. doi:10.1016/j.ejim.2018.04.019

Dijk, A. H. V., Wennmacker, S. Z., Reuver, P. R. D., Latenstein, C. S. S., Buyne, O., Donkervoort, S. C., Van Laarhoven, Cornelius, J. H. M. (2019). Restrictive strategy versus usual care for cholecystectomy in patients with gallstones and abdominal pain (SECURE): a multicenter, randomized, parallel-arm, non-inferiority trial. *The Lancet*, *393*(10188), 2322–2330. doi: 10.1016/s0140-6736(19)30941-9

Feldman, M., Friedman, L. S., & Brandt, L. J. (2016). *Sleisenger and Fordtrans gastrointestinal and liver disease: pathophysiology/diagnosis/management* (10th ed.). Philadelphia, PA: Saunders/Elsevier.

Janssen, E. R., Hendriks, T., Natroshvili, T., & Bremers, A. J. (2019). Retrospective Analysis of Non-Surgical Treatment of Acute Cholecystitis. *Surgical Infections*. doi: 10.1089/sur.2019.261

Jee, S. L., Jarmin, R., Lim, K. F., & Raman, K. (2018). Outcomes of early versus delayed cholecystectomy in patients with mild to moderate acute biliary pancreatitis: A randomized prospective study. *Asian Journal of Surgery*, *41*(1), 47–54. doi: 10.1016/j.asjsur.2016.07.010

Lee, Y. S., Kang, B. K., Hwang, I. K., Kim, J., & Hwang, J.-H. (2015). Long-term Outcomes of Symptomatic Gallbladder Sludge. *Journal of Clinical Gastroenterology*, *49*(7), 594–598. doi: 10.1097/mcg.0000000000000202

Loozen, C. S., Oor, J. E., Ramshorst, B. V., Santvoort, H. C. V., & Boerma, D. (2016). Conservative treatment of acute cholecystitis: a systematic review and pooled analysis. *Surgical Endoscopy*, *31*(2), 504–515. doi: 10.1007/s00464-016-5011-x

Ito, E., Takai, A., & Takada, Y. (2018). Quality of life after single port laparoscopic cholecystectomy: a randomized clinical trial. *Surgery*, *20*, 353–359. doi: 10.1016/j.hpb.2018.06.176

Overby, D. W., Apelgren, K. N., Richardson, W., & Fanelli, R. (2010). SAGES guidelines for the clinical application of laparoscopic biliary tract surgery. *Surgical Endoscopy*, *24*(10), 2368–2386. doi: 10.1007/s00464-010-1268-7

Shephard, R. J. (2015). Physical Activity and the Biliary Tract in Health and Disease. *Sports Medicine*, *45*(9), 1295–1309. doi: 10.1007/s40279-015-0346-3

Zakko, S. F. (2018). Overview of nonsurgical management of gallbladder stones. Retrieved March 19, 2020, from https://www.uptodate.com/contents/overview-of-nonsurgical-

management-of-gallbladder-stones?sectionName=MANAGEMENT&search=gallstones&topicRef=673&anchor=H2729867108&source=see_link#H2729867108