A Mega Gall Bladder Refuting "Courvoisier's Law"

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Abstract

Gall Bladder stone is a very common surgical problem. As per Courvoisier’s law the gallstone disease and gallbladder distension do not go hand in hand in lieu of gallstone-induced fibrosis impairing the gall bladder distensability. The present case clearly shows that gallbladder organ distensibility remains unaffected in patients with stone pathology. Although, Courvoisier’s phenomena is observed in some cases, the underlying pathogenic mechanism does not appear to be related to gallstone induced fibrosis.

Introduction

Gall Bladder stone is a very common surgical problem. As per Courvoisier’s law the gallstone disease and gallbladder distension do not go hand in hand in lieu of gallstone-induced fibrosis impairing the gall bladder distensability. The present case clearly shows that gallbladder organ distensibility remains unaffected in patients with stone pathology. Although, Courvoisier’s phenomena is observed in some cases, the underlying pathogenic mechanism does not appear to be related to gallstone induced fibrosis.

Case Report(s)

A 75-year-old female patient presented to surgical outpatient with more than 10 years history of dyspeptic symptoms and right upper quadrant abdominal pain that worsened in the last few months, prior to presentation. There was no past admission for cholecystitis, cholangitis, pancreatitis or obstructive jaundice. Family, past and personal history was not contributory. Abdominal examination was grossly normal except for a palpable gall bladder. All the blood and urine examination including liver function tests and amylase, were within normal reference range. Ultrasound examination of abdomen showed choledolithiasis with normal gallbladder wall thickness and liver echo-texture. There was no abnormality in the biliary tree. In view of symptomatic choledolithiasis, patient was booked for a laparoscopic cholecystectomy.

Intra-operatively, a hugely distended gall bladder extending from the inferior border of the liver till the umbilical port was found (Figure-1). The CBD, liver and rest of the peritoneal cavity were within normal limits. Despite the intraoperative difficulty to grasp such a huge gall bladder, the operation could be accomplished with standard American four-port technique without any complication. Needle decompression of 294 mill-litre of bile was done at the outset to reduce the size of the gall bladder. During dissection, there was an inadvertent tear in the gall bladder wall resulting in considerable spillage of bile. A suture was placed to secure the leak.

Gross examination of the specimen revealed a gallbladder of dimension 17.5 cm x 3.5 cm (normal gall bladder dimension is 7-10cm) approximately with residual bile amounting to 66mL (normal capacity of a gall bladder is 30-50mL)(Figure 2). Gall bladder wall thickness and interior mucosal lining were within normal limits. Histo-pathological examination of the gallbladder was unremarkable. Patient's post-operative recovery was uneventful. Patient was further investigated postoperatively by CT scan abdomen and pelvis, MRCP, and upper GI endoscopy, which did not show any obstructive pathology in the biliary tract or pancreas. These tests were not indicated prior to the surgery in lieu of normal preoperative investigations.

Discussion

Enlarged gall bladders are found in conditions like mucocele of the gall Bladder, empyema of gall bladder, malignant obstruction of CBD, and gall bladder carcinoma. Traditionally, the Courvoisier's law is widely described in relation to palpable gall bladder, which states, "In the presence of a palpable gall bladder, painless jaundice is unlikely to be caused by gallstones". Courvoisier's law was named after Ludwig Georg Courvoisier, a surgeon from Basel, Switzerland, who was one of the first surgeons to remove gallstones from the common bile duct. In 1890, Courvoisier published the book Casuistisch-statistische Beiträge zur Pathologie und Chirurgie der Gallenwege, a manual on biliary surgery in which he introduced this medical sign known as Courvoisier's law. The pathogenic mechanism purported behind this observation was that, gallstone disease is a chronic condition that results in a shrunken, fibrotic gall bladder, precluding any organ
distension. On the contrary, in malignant obstruction, where the gall bladder pliability is unaffected, huge distension of the organ is a common finding.

Even though the patient is not jaundiced, this case shows the immense distensible capacity of this organ, that is maintained even amidst the so-called ‘chronic gall stone induced fibrosis’ in a patient who has been suffering from this gall stone disease since a decade with several episodes of biliary colic. The observations not only refutes the popular belief correlating gall stone induced fibrosis and non-distensibility of gall bladder, but also points to the possibility of alternate underlying pathogenic mechanisms. Furthermore, normal gallbladder wall thickness in this case, also shows that gallstone induced fibrosis doesn’t necessarily take place in every case of long standing gall stone disease.

Recent in vitro experiments showed that gallbladder dispensability is similar in stone and non-stone pathologies. A study done by Chung et al shows that pliability of the gall bladder was equal in the gall stones, peri-ampullary cancer and in normal subjects. In view of the lack of support to the classical explanation, the following alternate explanations are more likely.

1. CBD Stones causes partial and intermittent obstructions (due to “ball-valve” action of stone) leading to less consistent intraductal pressure elevations, and less gallbladder distension. In contrast, malignant diseases cause progressive and total bile duct obstruction leading to more consistent intra-ductal pressure elevation and gall bladder distension.

2. Secondly, the chronicity of obstruction is longer in malignancy as compared to gall stone disease leading to intra-ductal hypertension and gall bladder distension of greater magnitude in the former cases.

Conclusion

Gall bladder distensibility remains unaffected in patients with gallstone disease. The unlikelihood of CBD stone causing a palpable gallbladder in an obstructive jaundice patient (as described by Courvoisier) is because of intermittent and non-consistent bile duct obstruction rather than gallstone induced fibrosis of the gall bladder.

Legends of the figures

Figure– 1: The intra-operative view of the hugely distended gall bladder.

Figure–2: Post-operative gall bladder specimen containing residual bile following 294 mill-litres of bile aspiration and considerable spillage intra-operatively.

References

Illustrations

Illustration 1

Figure 1 The intra-operative view of the hugely distended gall bladder.

Illustration 2

Figure 2 Post-operative gall bladder specimen containing residual bile following 294 mill-litres of bile aspiration and considerable spillage intra-operatively.