EDITORIAL

Is there evidence to perform routine cholecystectomy in all porcelain gallbladder?

Porcelain gallbladder (PGB) is the calcification of the gallbladder (GB) wall from excessive calcium deposits. This is usually associated with a GB that is brittle and fragile and which appears bluish or whitish(Figure 1). GB calcification occurs in two ways: either selective mucosal calcification or diffuse intramural calcification.

Porcelain gallbladder is not considered to be a pre-malignant condition but has historically been treated with routine cholecystectomy because of the high association with cancer of the gallbladder (CaGB). This association has been well documented.

From the early 20th century, several studies emerged, reporting high incidences. In one study of,[4] 271-cholecystectomy specimens, adenocarcinomas were noted in 12.5%.[1] In another report from Argentina, CaGB was detected in 61.5% specimens.[2] In their analysis of 25,900 GB specimens, Stephen et al. found the incidence of gallbladder cancer and calcium deposition to be 7%.[3]

Several recent reports have indicated a much lower incidence of CGB, thus calling into question the long-accustomed practice of performing routine cholecystectomy in patients with PGB. A recent systematic review by Shnelldorfer found, in a subgroup of a 111-studies, the rate of gallbladder malignancy to be only 6%.[4] Another case series and systemic review report by Khan et al in 2011, noted the incidence of CaGB in patients with PGB to be 6%.[5] A systematic review by Machado in 2018, involving 60,781 patients, found the rate to be 6.3%.[6]

The reason for the decline in reported cases of malignancy associated with PGB include enhanced diagnosis before they cause symptoms because of improved modern imaging techniques, possible change in the natural history of the disease consequent on change in dietary or environmental factors, and readiness of patients to undergo less invasive surgery with the advent of laparoscopic cholecystectomy. This may result in the removal of PGBs well before their progression to malignancy.[7] The increase availability of high-quality imaging procedures has led to a corresponding decrease in the rate of detection of CaGB among patients with PGB.[3-5,8]

Most GB calcification are asymptomatic, as evidenced by high number of incidental findings of calcified gallbladder. Hence there is gross underreporting and a falsely high rate of malignancy being reported. The reasons for high rates in some reports include: publication bias, where publishers are deliberate at pushing 'rare' cases only for publication; selection bias, whereby cases are selected from a population of GB cancer patients rather than from the general population and sampling bias, since most cases published are from institutions with patients presenting with gallbladder-related complaints.[4] In summary, most PGB are asymptomatic and hence, undiagnosed resulting in an unreported pool of benign cases.

The cause of calcified GB is poorly understood but it is reported to be because of chronic inflammation. Abnormalities of calcium metabolism are thought to play a role in some cases.[5] Nevertheless, the association between PGB and CaGB is not in doubt.[3,5,9-15] A degeneration and regeneration process within the GB epithelium and a cavity containing stagnant chemical may lead to mucosal dysplasia, which may act as a carcinogenic process.[6]

Abdominal ultrasound scan and non-contrast

CT scan are effective ways to detect calcified gallbladder. However, diffuse malignancy may not be distinguished from inflammation by USS or CT scan. Routine MRI may equally show hyperintensity from either malignancy or inflammatory processes. In the event that CT scan is not conclusive, further investigation to detect malignancy is required. Diffusion-weighted magnetic resonance imaging (MRI) has been shown to increase diagnostic accuracy in PGB associated GB malignancy by showing linear hyperintense lines resulting from hypercellular tumor regions which distinguish it from benign lesions.[16]

There is, as of today, no set of reliable potential predictive indicators for early malignancy from a PGB. There are studies that suggest an association between cancer of GB and PGB where there is focal GB mucosal calcification rather than those with extensive calcification.[3,17,18] However, a recent systematic review did not support the view that the depth of calcification is a predictor of malignancy; hence, this factor should not be used as an indicator of the risk of developing malignancy in the future.[4]

The overall risk of malignancy is 0.8-6%.[6,19] Therefore, the role of prophylactic cholecystectomyis debatable , given that the risk of major complication of laparoscopic cholecystectomy is significant. The case for prophylactic cholecystectomy emphasizes the advantages of removing the gallbladder along with an existing, early or a potential malignancy. This could be potentially curative and avoids any legal implications froma delayed management. For this reason, a young, fit patient should be given the option for a prophylactic laparoscopic cholecystectomy, while a non-operative approach could be considered in older patients with significant comorbidity. Symptomatic patients should undergo cholecystectomy regardless of age if they are fit for the procedure.

There is a conversion rate of 5-25% from laparoscopic to open cholecystectomy because of the challenges associated with the brittle nature of the GB, difficulty with grasping and dissecting it.[5,8,20] There may also be an inability to obtain a critical view of the cystic duct and artery.[5] However, many have reported successful procedures. Frozen section is ideal during the laparoscopic cholecystectomy and, conversion to open when this reveals malignancy, should be followed by wedge resection of the liver and gallbladder bed and lymphadenectomy (extended/radical cholecystectomy).

In conclusion, recent evidence has shown that the incidence of cancer of the gallbladder from porcelain gallbladder is much lower than previously believed. Prophylactic cholecystectomy should be considered in young, fit patients. For asymptomatic patients with comorbidities exceeding the risk of cholecystectomy, non-operative management with prolonged follow up is recommended.

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