



Special article

Porcelain gallbladder: a clinical case and a review of the literature

Mariano Palermo,* Marcela Núñez, Guillermo E. Duza, Mercedes Giménez Dixon, Miguel O. Bruno, Francisco J. Tarsitano

Servicio de Cirugía Digestiva y Percutánea, Hospital Nacional Profesor Alejandro Posadas, Haedo, Buenos Aires, Argentina

ARTICLE INFORMATION

Article history:

Received July 14, 2010

Accepted September 21, 2010

Keywords:

Porcelain gallbladder

Diagnosis

Treatment

Gallbladder cancer

A B S T R A C T

Porcelain bladder is defined as calcification of the gallbladder wall. It is a rare condition and is seen in 0.06% to 0.8% of cholecystectomies. Its origin is still unknown.

We report two cases of patients with a porcelain gallbladder. One case is a 60 year-old male patient who was seen due to having biliary symptoms. The diagnosis was made by ultrasound and computed tomography, and he was surgically intervened by performing a partial cholecystectomy. The histopathology reported a gallbladder wall with sclerohyalinosis and dystrophic calcification foci. The other case is a 98 year-old female patient, whose form of presentation was incidental given that she suffered from symptoms of an intestinal obstruction. A cholecystectomy was performed with a good post-surgical outcome.

A series published in between 1950 and 1960 show that the porcelain bladder can be frequently observed in patients with cancer of the gallbladder, although this relationship is currently being rejected. The reason why these cases are being presented is because of their low incidence and the controversy over what treatment to use, due to its association with gallbladder cancer.

© 2010 AEC. Published by Elsevier España, S.L. All rights reserved.

Vesícula de porcelana. Caso clínico y revisión de la literatura

R E S U M E N

Vesícula en porcelana se define como la calcificación de la pared de la vesícula biliar. Es una rara entidad que se observa en el 0,06 a 0,8% de las colecistectomías. Su etiología sigue siendo desconocida.

Reportamos dos casos de pacientes con vesícula en porcelana. Un caso es un paciente masculino de 60 años que consulta por sintomatología biliar, se realiza el diagnóstico mediante ecografía y tomografía computada y es intervenido quirúrgicamente realizándose colecistectomía parcial con anatomía patológica que informa: pared vesicular con

Palabras clave:

Vesícula en porcelana

Diagnóstico

Tratamiento

Cáncer de vesícula

*Corresponding author.

E-mail address: palermomd@msn.com (M. Palermo).

esclerohialinosis y focos de calcificación distrófica. El otro caso es una paciente femenina de 98 años, cuya forma de presentación fue incidental dado que cursaba con cuadro de oclusión intestinal, se realizó colecistectomía con buena evolución postoperatoria.

Series publicadas entre los años 1950 y 1960 avalan que la vesícula en porcelana puede observarse con frecuencia en pacientes con cáncer de vesícula, aunque recientemente se ha desestimado este tipo de relación. El motivo por el cual se presentan estos casos es su baja frecuencia y su controversia en lo que al tratamiento se refiere por su relación con el cáncer de vesícula.

© 2010 AEC. Publicado por Elsevier España, S.L. Todos los derechos reservados.

Introduction

Porcelain gallbladder is defined as a calcification of the gallbladder wall. It is a rare condition and is seen in 0.06% to 0.8% of cholecystectomies. It was first described in 1929.¹⁻³

There are various hypotheses on the mechanism which causes porcelain gallbladder, but its aetiology remains unknown. Some authors maintain that it is an unusual manifestation of chronic cholecystitis.^{1,3,4}

Some series prove that porcelain gallbladder can frequently be observed in patients with gallbladder cancer, based on retrospective studies published between 1950 and 1960. However, more recently published articles reject this type of relationship, reporting that this condition has a low incidence in cancer cases. Nonetheless, there is still controversy about the relationship between porcelain gallbladder and gallbladder cancer.^{2,3}

This article reports of two patients that have porcelain gallbladder, explaining how the condition presented, its symptoms, diagnostic methodology, and treatment. We will also perform an extensive review of the literature.

Clinical case

Case I

Sixty-year-old male patient, smoker of 40 cigarettes/day, with symptoms of biliary colic. An ultrasound was performed, showing: moderate steatosis, common bile duct of 7.2 mm, and calcification in the gallbladder area with posterior acoustic shadowing, which is indicative of porcelain gallbladder.

We performed a computed tomography which showed that the gallbladder was completely calcified and the walls' thickness had increased (Figure 1, Figure 2). No pathological results were found in the laboratory tests.

The patient underwent a planned partial cholecystectomy with a Pezzer's catheter, lavage and drainage.

The patient evolved satisfactorily, tolerating food on the second postoperative day, being discharged 5 days following surgery.

Two days after being discharged, he was readmitted to the surgery department due to abdominal pain, vomiting, fever and faecal discharge through the Pezzer's catheter. The night doctor performed the surgical intervention, confirming faecal peritonitis and necrosis of the hepatic flexure of the colon. A right colectomy with end-to-end anastomosis was

performed. Five days following surgery he tolerated liquid diet, and on the 10th day was discharged. He then received outpatient follow-up with external units. A month after surgery and following several intercurrents due to fever and purulent discharge through the Pezzer's catheter, he was hospitalised to plan a complete cholecystectomy.

During the reintervention, we partly resected the gallbladder which was calcified and completely adhered to the liver. Given the extent that the bladder had adhered to the liver, it was technically impossible to perform complete cholecystectomy. Furthermore, the bladder calcification was extremely close to the hepatic hilum, meaning that we decided that it would be unsafe to complete the cholecystectomy. The patient had good postoperative evolution. The anatomical pathology results showed a fragment of the gallbladder wall with sclerosis and hyalinosis, and dystrophic calcification foci.

Case II

Ninety-eight year-old female patient with history of high blood pressure, iron deficiency anaemia, and chronic arthritis in the lower limbs. She was admitted to the clinical medicine department for amputation of a lower limb due to moist gangrene. At the same time, she was suffering from abdominal pain, vomiting, and ileus that had developed over 48 hours. Abdominal palpation found that the abdomen was tense, painful on the right side, being more intense when decompressed. We performed an abdominal x-ray which

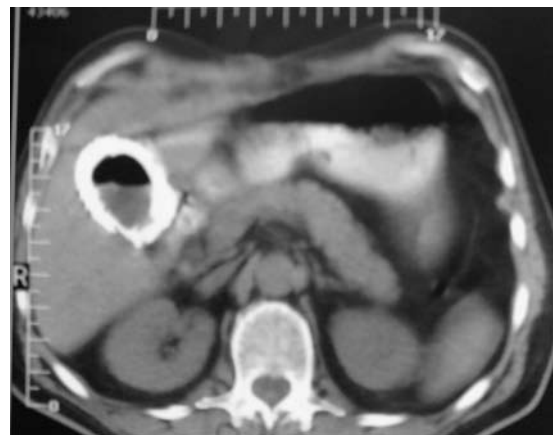


Figure 1 – CT: gallbladder with completely distended and calcified wall, with biliary sludge on the inside (liquid-liquid level). Indicative of porcelain gallbladder.



Figure 2 – CT scout: radiopaque mass with radiolucent centre at the right hypochondrium level.

showed that the colonic area was greatly distended and in the right hypochondrium and flank a calcified rounded mass with clear margins is observed (Figure 3). She had no symptoms that were compatible with biliary colic.

An emergency surgical intervention was performed, showing that the colonic area was greatly distended, with no evidence of tumour. In the right hypochondrium, we observed that the gallbladder was completely calcified and adhered to the duodenum and the transverse colon. The gallbladder was released from these structures and there



Figure 3 – Stand-up chest and abdomen x-ray: calcium mass with superposition of intestinal loops on the right hypochondrium.

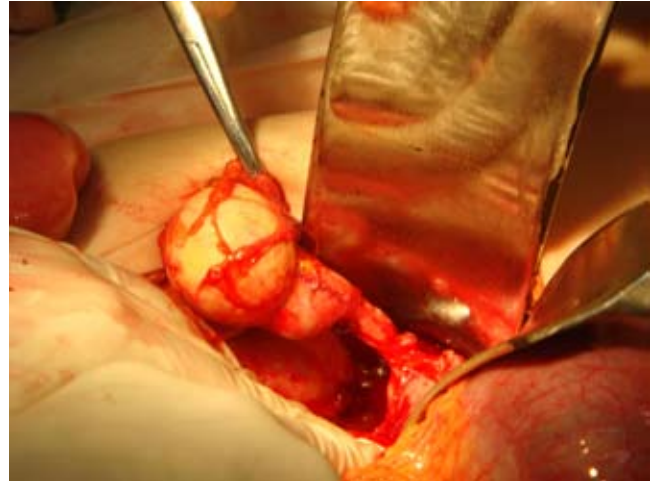


Figure 4 – Gallbladder with calcified walls, completely calcified until the cystic duct.



Figure 5 – Porcelain gallbladder. Anatomical pathology results: sclerosis and hyalinosis of the wall and dystrophic calcification foci.

was no sign of colon or duodenum fistula (Figure 4). A conventional cholecystectomy was performed, removing the whole gallbladder. Its walls were completely calcified and stony-hard. We observed lithiasis and biliary sludge. Although the patient's planned intervention was not due to symptoms of a biliary disorder, we decided to perform a cholecystectomy, given that she presented with a completely calcified gallbladder which adhered to the colon and duodenum, and because it was technically impossible to release it from these structures.

The patient had a satisfactory outcome, preserving intestinal transit, with diet tolerance and without any surgical complications. Anatomical pathology results showed: gallbladder wall with parietal sclerosis and hyalinosis and dystrophic calcification (Figure 5).

Given the rarity of this condition, we decided to document these two cases that were presented in our hospital, and reviewed the literature with regards the matter and its relationship with gallbladder cancer.

Discussion

Porcelain gallbladder is defined as a calcification of the gallbladder wall. It is a rare condition and is seen in 0.06% to 0.8% of cholecystectomies. It was first described in 1929.³ It is a rare manifestation of a chronic gallbladder disease. It is most observed in patients in their sixties and has a greater incidence in women (ratio 4-5:1).⁵ The aetiology of porcelain gallbladder is still unknown. Some hypotheses suggest that it is a rare manifestation of a chronic gallbladder disease due to gallbladder wall haemorrhage and its subsequent calcification. Other hypotheses maintain that this condition is due to calcium metabolism disorders. Some authors describe its association with giardiasis. Another possibility would be its relationship with chronic xanthogranulomatous cholecystitis.^{3,5-7}

Other possible causes are related to gallbladder lithiasis and chronic cholecystitis.

The incidence of cancer developing with porcelain gallbladder varies from 12% to 62% according to published studies.^{3,8} These data are based on retrospective studies that were published between 1950 and 1960. However, recent reviews suggest that the relationship between cancer and porcelain gallbladder is much weaker than that suggested in earlier decades.^{2,3} A review of 10 741 cholecystomised patients was performed, and 88 of them were due to gallbladder cancer and none showed calcification or any type of relationship with porcelain gallbladder. Fifteen (0.14%) of the cholecystectomy patients presented with porcelain gallbladder, but none of them was associated with gallbladder cancer. Ten (67%) visited the doctor for biliary colic symptoms or cholecystitis and the diagnosis was incidental in 5 (33%) asymptomatic patients. All of the specimens showed signs of chronic cholecystitis and parietal calcification. Nine (60%) were associated with gallbladder lithiasis. As we have previously mentioned, none of the patients with porcelain gallbladder had gallbladder cancer. The authors therefore suggest that this condition should be treated in a different way. However, we believe that although the reported incidence of cancer is low, prophylactic cholecystectomy should still be performed as there is a clear relationship with gallbladder cancer. Although gallbladder surgery² poses some risk, performing minimally invasive surgery reduces costs, hospital stay and the postoperative recovery is quicker for patients.

Another similar review performed on 25 900 cholecystectomy patients presented 150 cases of gallbladder cancer and 44 of porcelain gallbladder, where approximately 7% of the patients with porcelain gallbladder showed signs of gallbladder cancer.^{3,9}

Some authors recommend prophylactic cholecystectomy for porcelain gallbladder given the poor prognostics for gallbladder cancer, although the relationship between the two conditions is not as significant as was believed in previous years.

Kwon et al consider laparoscopic cholecystectomy to be an important contraindication for patients with porcelain gallbladder, given the risk for gallbladder cancer. These authors performed surgical interventions on 1608 patients

with porcelain gallbladder. They classified their patients as type I and type II, based on the computerised axial tomography with contrast, and the findings from the preoperative ultrasound. They performed laparoscopy on 10 type I cases, which did not show cancer in the calcification of the gallbladder walls. Three patients were classified as type II and underwent conventional surgery. One of these patients had gallbladder cancer and a hepatectomy and cholecystectomy were performed. They concluded that the preoperative classification for porcelain gallbladder patients is vitally important when deciding which technique to choose. They also suggest that patients with type I porcelain gallbladder could be intervened on using laparoscopy while patients with a greater risk of gallbladder cancer should be operated on using conventional open surgery.¹⁰ Although laparoscopic cholecystectomy is currently the gold standard for treating benign gallbladder disorders, we believe that the initial approach should be laparoscopy and if there are any difficulties using this technique, conventional surgery should then be used.

Kianmanesh et al consider porcelain gallbladder as a precancerous lesion, alongside polyps over 1.5 cm, common bile duct cysts, and environmental dietary factors. They suggest that porcelain gallbladder is a risk factor for gallbladder cancer, especially when the mucosa becomes calcified. They also state that any chronic infection of the gallbladder is involved as a risk factor for malignant degeneration of the gallbladder.¹¹

As can be observed, there is still controversy with regards the relationship between porcelain gallbladder and gallbladder cancer.

We believe that diagnosis should include a patient interview, physical and laboratory examination, hepatobilio-pancreatic ultrasound to observe the characteristics of the gallbladder and nearby organs, direct abdominal x-ray to examine the site of the gallbladder (if calcified, it is easy to observe using this method) and a computed tomography with contrast to observe the gallbladder in more detail.^{12,13}

We believe that symptomatic patients should be treated with cholecystectomy. Asymptomatic patients should also be indicated prophylactic cholecystectomy given that there is a relationship with gallbladder cancer. Controversy remains although the percentage of patients with gallbladder cancer and porcelain gallbladder is lower than is published in past decades.

When complete cholecystectomy is possible, we believe that it is the best solution, if not, as was the case for our first patient; partial cholecystectomy can be performed when anatomopathological results are benign; and if it were to be associated with gallbladder cancer, a hepatectomy could be performed.

Conclusions

Porcelain gallbladder is a rare condition, and although its association with gallbladder cancer is controversial, risk of cancer is documented by different studies. We therefore believe that surgical treatment should be indicated

whether symptoms of cancer are present or not. The surgeon should choose the surgical method with which s/he is most confident.

Although there is not strong evidence on the relationship between porcelain gallbladder and gallbladder cancer, some risk has been described. As such, the preoperative study method must be more thorough in these patients.

REFERENCES

1. Polk HC. Carcinoma and calcified gallbladder. *Gastroenterology*. 1966;50:582-5.
2. Towfigh S, McFadden DW, Cortina GR. Porcelain gallbladder is not associated with gallbladder carcinoma. *Am Surg*. 2001;67:374-82.
3. Opantrny L. Porcelain gallbladder. *CMAJ*. 2002;166:933.
4. Castell HB, Williamson SL, Golladay ES, Fierdorek SC. Porcelain gallbladder in a child: a case report and review. *J pediatr Pediatr Surg*. 1990;25:1302-3.
5. Fukui T, Masaaki N, Uchida K, Matsushita M, Nishio A, Seki T, et al. Endoscopic biliary plastic stenting and successful intentional stent retrieval in a benign biliary stricture with mural spherical calcification and porcelain gallbladder. *Intern Med*. 2009;48:809-13.
6. Ashud H, Siegal B, Oland Y, Adam TG. Calcified gallbladder (porcelain gallbladder). *Arch Surg*. 1978;113:594-6.
7. Ros P, Goodman Z. Xanthogranulomatous cholecystitis versus gallbladder carcinoma. *Radiology*. 1997;203:10-2.
8. Cornell CM, Clarke R. Vicarious calcifications involving the gallbladder. *Ann Surg*. 2001;67:7-10.
9. Stephen AE, Berger DL. Carcinoma in the porcelain gallbladder: a relationship revisited. *Surgery*. 2001;129:699-703.
10. Kwon AH, Inui H, Matsui Y, Uchida Y, Hukui J, Kaniyama Y. Laparoscopic cholecystectomy in patients with porcelain gallbladder based on the preoperative ultrasound findings. *Hepatogastroenterology*. 2004;51:950-3.
11. Kianmanesh R, Scaringi S, Castel B, Flamant Y, Msika S. Precancerous lesions of the gallbladder. *J Chi (Paris)*. 2007;144:566.
12. Rooholaminni S, Tehrani N, Razavi M, Au A, Hansen G, Ostrzega N, et al. Imaging of gallbladder carcinoma. *Radiographics*. 1994;14:291-306.
13. Delpierre I, Tack D, Moisse R, Bouaka W, Delcour C. Cholecystoduodenal fistula in a porcelain gallbladder. *Eur Radiol*. 2002;12:2284-6.