

# Emergency Imaging

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Figure 1

**A** 67-year-old woman without a significant medical history presents to the ED with diffuse abdominal pain. Abdominal radiographs were obtained and the upright image is shown above (Figure 1).

**What is the diagnosis?  
Is additional imaging necessary? If so, why?**

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## ANSWER



Figure 1



Figure 2



Figure 3

**W**hile the upright abdominal radiograph (Figure 1) does not show evidence of bowel obstruction (eg, dilated loops of bowel) or free air (eg, air layering under the diaphragm), there is blunting of the costophrenic angle (white arrow, Figure 2), indicating the presence of a pleural effusion and an oval calcified structure (black arrows, Figure 2) in the right upper quadrant. This calcified structure has the shape of, and is situated in, the expected location of the gallbladder.

The differential diagnosis for a calcified round or oval right upper quadrant lesion includes gallbladder wall calcification, large calcified gallstone, or possibly, calcified right renal cyst. Based on the lateral location in this case, renal cyst is unlikely. Ultrasonography is typically

the imaging modality of choice for suspected gallbladder pathology because of its ability to directly evaluate the gallbladder wall and lack of ionizing radiation. However, since calcification reflects sound waves, its ability to characterize calcified lesions is limited. Therefore, computed tomography (CT) was ordered to further evaluate the radiograph findings. CT axial and coronal images revealed diffuse gallbladder wall calcification (white arrows, Figures 3 and 4).

Gallbladder wall calcification, also known as “porcelain gallbladder,” is a rare finding, occurring only in an estimated 0.1% to 0.2% of all patients with gallbladder stones.<sup>1</sup> Although usually an asymptomatic finding, this condition was historically treated with prophylactic

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Figure 4

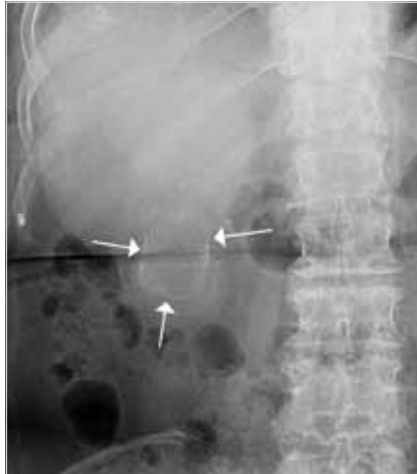


Figure 5

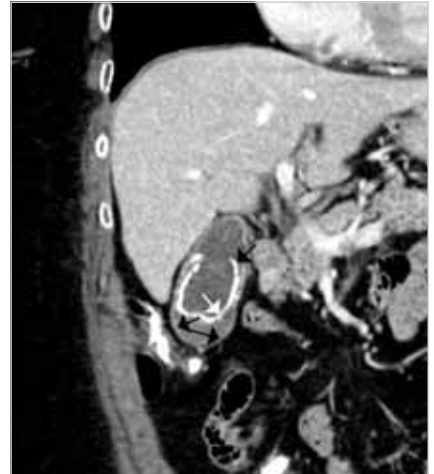


Figure 6

cholecystectomy due to reported associated malignancy rates as high as 62%.<sup>2</sup> Recent studies, however, suggest the association between gallbladder carcinoma and porcelain gallbladder is significantly lower than previously believed, with one review demonstrating only a 3% risk for malignancy. These studies also suggest prophylactic surgery may not be necessary and that the majority of patients may be followed utilizing serial imaging.<sup>1,2</sup>

Large gallstones can mimic a porcelain gallbladder on radiography.<sup>3</sup> For example, in Figure 5, an abdominal radiograph taken from another patient shows a structure in the right upper quadrant (white arrows) that is similar in appearance to the calcified gallbladder seen in this case (Figures 1 and 2). CT examination in the second

patient, though, reveals a large calcified gallstone (white arrows, Figure 6) within a normal gallbladder (black arrows, Figure 6). Therefore, identifying and confirming the presence of a porcelain gallbladder is important to ensure appropriate patient follow-up care. The patient in this case continues to be followed without any evidence of malignancy.

#### REFERENCES

1. Schnelldorfer T. Porcelain Gallbladder: A benign process or concern for malignancy? *J Gastrointest Surg.* 2013;17(6):1161-1168.
2. Khan ZS, Livingston EH, Huerta S. Reassessing the need for prophylactic surgery in patients with porcelain gallbladder. *Arch Surg.* 2011;146(10):1143-1147.
3. Park JH, Park do H, Park SH, Lee SH, Chung IK, Kim SJ. Rim calcification of gallbladder stones: mimicking porcelain gallbladder. *Gastrointest Endosc.* 2006;63(7):1067-1068.