CASE REPORT

Gallbladder Pseudodiverticulosis Mimicking a Multiseptate Gallbladder with Stones

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Gallbladder diverticula have the appearance of hernia-like protrusions of the gallbladder wall. This disorder may not be diagnosed until surgically resected because it has no clinical significance unless there are associated diseases. Gallbladder pseudodiverticula have an acquired cause, multiple fundal lesions, an association with gallstones, internal saccular lesions without external hernia-like protrusions, and little to no smooth muscle in the gallbladder wall. We report a unique anomaly of multiple pseudodiverticula presenting with calculous cholecystitis, which was pathologically different from true diverticula and had a unique shape similar to a bunch of grapes and a septation infilling pattern on endoscopic retrograde cholangiography. (*Gut and Liver* 2009;3:134-136)

Key Words: Gallbladder; Pseudodiverticulum

INTRODUCTION

Diverticular diseases of the gallbladder are unusual congenital or acquired diseases occurring only in 0.1% to 0.2% of cases in previous studies of resected gallbladder specimens.¹⁻³ These diseases are divided into congenital (true) diverticula and acquired pseudodiverticula according to different developmental, clinical, and pathological features.^{4,5}

We describe a unique imaging case of pseudodiverticulosis of the gallbladder mimicking multiseptate gallbladder accompanied with multiple stones, as confirmed by surgical operation.

CASE REPORT

A 70-year-old woman presented with right upper quadrant abdominal pain radiating to the right lower abdomen; the pain had begun to aggravate the subject 8 to 9 hours earlier. Her medical history contained no significant events or diseases. Clinical examination revealed mild tenderness in the right upper quadrant of the abdomen. Laboratory tests revealed the followings: white blood cell count, $8.900 \times 10^9/L$; hemoglobin, 13.4 g/dL; amylase, 36 IU/L; aspartate aminotransferase, 42 U/L; alanine aminotransferase, 50 U/L; and alkaline phosphatase, 162 IU/L.

Fig. 1. Endoscopic retrograde cholangiography showing multiple linear septated radiolucent defects and multiple variable-sized saccular filling defects in the gallbladder lumen.

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Abdominal ultrasonography revealed multiple hyperechoic lesions in the gallbladder and linear septum-like structures in the fundus of the gallbladder. Subsequently, endoscopic retrograde cholangiography (ERC) was performed to evaluate the lesion; it showed multiple linear septated radiolucent defects and a diffusely scattered bunch of grape-like saccular filling defects in the elongated gallbladder (Fig. 1). Operative findings showed a normal outer surface of the elongated gallbladder without any protruding lesions fixed on the gallbladder fossa of the liver (Fig. 2). Grossly, multiple black stones and a round sacc-

Fig. 2. Operative finding of a dilated gallbladder with a normal outer surface and no outpouching lesions.

ular lesion with an intervening septum-like structure were noted on the dissected gallbladder specimen (Fig. 3). Microscopic findings showed mucosal gland structures downsloping into a thin muscle layer (characteristically, the muscle layer is not thickened), which was different from adenomyomatosis (Fig. 4).

DISCUSSION

Gallbladder anomalies are diversely classified according to the shape and position of the Phrygian cap, multiseptation, and diverticula. ERC can be helpful in making a diagnosis and in the differentiation of these anomalous

Fig. 3. Gross findings of a dissected specimen of gallbladder revealing multiple black stones and round saccular lesions with an intervening septum-like structure.

Fig. 4. Microscopic findings: (A) the muscular layer was not thickened (H&E stain, orig. mag. $\times 10$), and (B) mucosal gland structures downsloping into the thin muscle layer were also evident (H&E stain, orig. mag. $\times 100$).

Table 1. Differential Diagnosis of Gallbladder Pseudodiverticulosis, Congenital Diverticula, and Adenomyomatosis

	Pseudodiverticula	True diverticula	Adenomyomatosis
Cause	Acquired	Congenital	Acquired
Clinically, Calculi	Usually present	Usually no clinical significance	Pigmented debris or calculi
Gross findings	Normal surface contour	Outpouching of the entire gallbladder wall	Usually normal surface
Microscopic findings	Mucosal herniation through the muscle layer (incomplete herniation) and muscular thinness	Normal wall structure	Deep and branching Rokitansky-Aschoff sinus with hyperplasia of the muscular layer (3 to 5 times)

diseases. One septum or fold of the gallbladder between the fundus and the body is called the "Phrygian cap;" whereas, multiseptate gallbladders are characterized by multiple internal septa of various sizes, and a faintly bosselated external surface.⁶⁻⁸ Gallbladder diverticulum is an unusual congenital disease, which has the appearance of a hernia-like protrusion of the normal gallbladder wall. This disorder may not be diagnosed until surgically resected because it has no clinical significance unless there are associated diseases.¹⁻³ Gallbladder pseudodiverticulum is a different type of adenomyomatosis pathologically, and can be differentiated from other similar anomalies based on some important factors. Pseudodiverticula have an acquired cause, multiple fundal lesions, an association with gallstones, internal saccular lesions without external hernia-like protrusions, and little to no smooth muscle in the gallbladder wall (Table 1).^{7,8}

In our case, ERC revealed a unique shape similar to a bunch of grapes and a septation infilling pattern, contrasting with the fundus of a lengthened gallbladder. We found a multiseptate gallbladder; it was characterized by a "honeycomb" multicystic pattern and further characterized by multiple fixed lucent defects within an opacified gallbladder. However, operative findings showed a grossly normal gallbladder without any outpouches of the wall or inflammatory changes, and we could see multiple saccular outpouches internally with multiple gallstones when the gallbladder was opened. Histopathologic examination revealed multiple pseudodiverticula, which were characterized by multiple downslappings of the mucosal gland to a thin muscle layer of fundus. This lesion was different

from the fundal type of lesion that is typical of adenomyomatosis or true diverticula, in terms of the definitive muscle thinness.

In summary, we diagnosed a unique, acquired anomaly of multiple pseudodiverticula presenting with calculous cholecystitis, which was pathologically different from true diverticula, adenomyomatosis, or multiseptate gallbladders.

REFERENCES

1. Gross RE. Congenital anomalies of the gallbladder; a review of one hundred and forty eight cases with report of a double gallbladder. *Arch Surg* 1936;32:131-162.
2. Kramer AJ, Bregman A, Zeddies CA, Guynn VL. Gallbladder diverticulum: a case report and review of the literature. *Am Surg* 1998;64:298-301.
3. Williams I, Slavin G, Cox A, Simpson P, de Lacey G. Diverticular disease (adenomyomatosis) of the gallbladder: a radiological-pathological survey. *Br J Radiol* 1986;59:29-34.
4. Garg P, Dass B. Multiple diverticula of gall bladder. *Indian J Gastroenterol* 1998;17:32-33.
5. Sirakov M, Trichkov V, Megdanski Kh, Mürmarov M, Trichkov Zh. Diverticula and pseudodiverticula of the gallbladder in chronic calculous cholecystitis. *Khirurgiia (Sofia)* 1996;49:35-36.
6. Foster DR. Triple gall bladder. *Br J Radiol* 1981;54:817-818.
7. Kramer EL, Rumancik WM, Harkavy L, Tiu S, Banner HJ, Sanger JJ. Hepatobiliary scintigraphy of the compartmentalized gallbladder. *AJR Am J Roentgenol* 1985;145:1205-1206.
8. Edell S. A comparison of the "phrygian cap" deformity with bistable and gray scale ultrasound. *J Clin Ultrasound* 1978; 6:34-35.