Florid Ducts of Luschka Mimicking a Well Differentiated Adenocarcinoma of the Gallbladder: A Case Report

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Citation

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Abstract

Ducts of Luschka are small bile ducts located within the gallbladder fossa. They appear to be a normal variant of the biliary anatomy. These ductules may be injured during cholecystectomy leading to bile leak and biliary peritonitis. We report here a cholecystectomy specimen with florid ducts of Luschka in an actively inflamed desmoplastic stroma, mimicking a well differentiated adenocarcinoma of the gallbladder. To our knowledge, no such cases have been reported in the English literature and this case highlights the fact that ducts of Luschka should be considered in the differential diagnosis of benign and malignant lesions of the gallbladder.

INTRODUCTION

While the majority of cholecystectomy specimens contain the rather mundane histological changes associated with chronic cholecystitis, a diverse spectrum of benign and malignant tumors also arise from the gallbladder ([1,2,3]). Due to their uncommon nature, pathological studies of gallbladder benign tumors and tumor-like lesions are rare and knowledge of the characteristics of these lesions is important because they frequently mimic the more ominous malignant neoplasms ([1,2,3]). We describe here a cholecystectomy specimen with florid ducts of Luschka mimicking a well differentiated adenocarcinoma of the gallbladder. To our knowledge, no such cases have been reported in the English literature.

CASE REPORT

A 91-year-old woman was referred with an 8 day history of right upper quadrant pain, nausea, vomiting and diarrhea. There was no history of fever, jaundice, anorexia or weight loss in the recent past. Her past medical history was significant for osteoporosis and her current medication included omeprazole, carbamazepine and co-amilofruse. Physical examination showed no significant abnormality. Laboratory tests demonstrated an increased CRP, WBC and mildly abnormal renal function. Liver function tests and serum tumor markers were all within the normal limits. Fecal culture was negative. Abdominal CT scan showed a distended gallbladder containing stones within the neck and body. The biliary tree was not dilated and the liver, spleen and both kidneys appeared normal. The pancreas was atrophic and diverticular disease was noted throughout the large bowel.

The patient underwent an open cholecystectomy. Intraoperatively, the gallbladder was dilated and congested. It was segmentally thickened and densely adherent to the liver. Opening drained purulent bile fluid with several gallstones measuring 5 to 20 mm in diameter.

The patient had an uneventful postoperative recovery but died from cardiac failure during the follow up period. A post mortem was not performed.

PATHOLOGIC FINDINGS

The cholecystectomy specimen was submitted for histopathological examination. Macroscopically, the gallbladder showed thickening of the fundus and body, particularly the bare area of gallbladder. The mucosa was largely necrotic and ulcerated. No localized tumor mass was seen. The serosal/external surface of the gallbladder was hemorrhagic and congested. The cut surface of the non-peritonealized bare area of the gallbladder showed marked thickening of the adventitial fibrous tissue with gelatinous areas.

Histologically, the thickened areas contained numerous ductules and tubules in a cellular stroma with varying-sized vessels, inflammatory cells and proliferative fibroblasts (Figure 1).

The ductules were small to medium-sized and were located within and at the periphery of the liver-side connective tissue. No similar ductules were identified within the submucosa or the muscularis propria. The ductules were lined by cuboidal to flattened biliary epithelium and were often surrounded by a dense collagenous collar (Figure 1). Some of the ductules were infiltrated by neutrophils and the lining epithelium showed regenerative and inflammatory atypia (Figure 1). Scanty eosinophilic debris was present in the ductules, but no bile pigment was seen. The adventitial connective tissue showed edema with a proliferation of fibroblasts and capillaries, giving a desmoplastic appearance.

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Figure 1

Figure 1: Florid ducts of Luschka mimicking a well differentiated adenocarcinoma of the gallbladder (1A & 1B, H&E staining) and (1C, pancytokeratin MNF116 immunostaining).

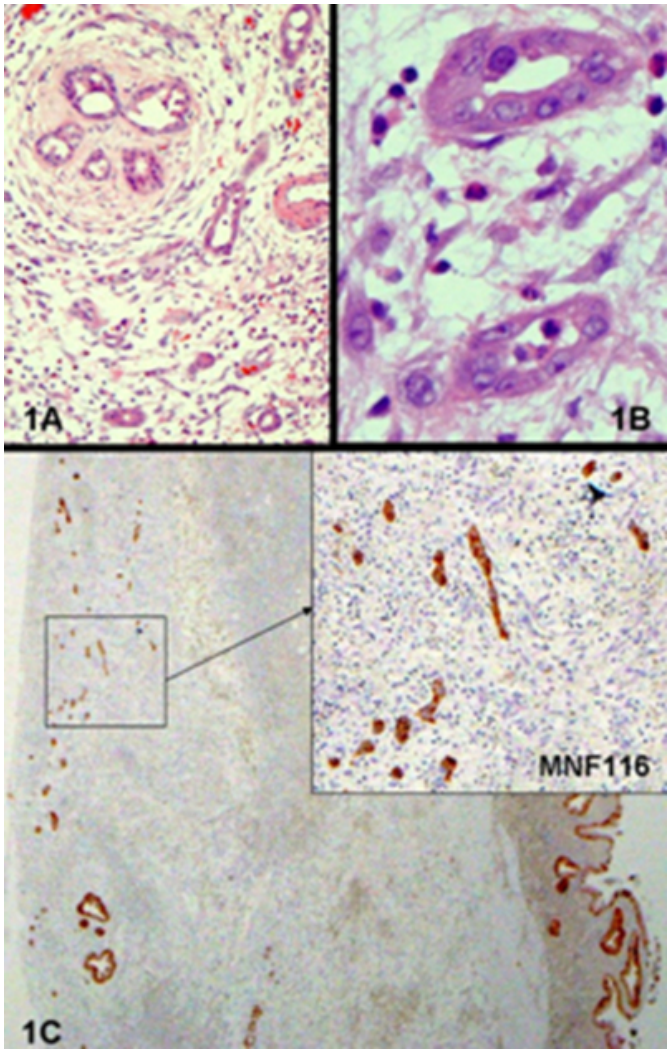
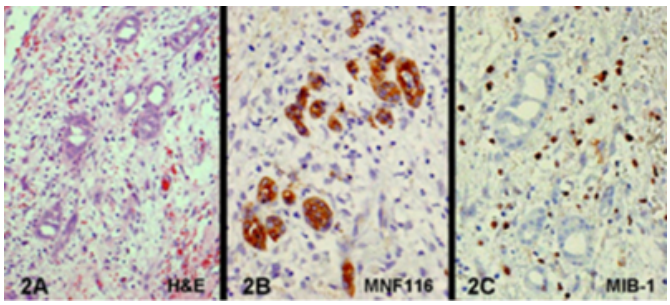


Figure 2

Figure 2: Groups of Luschka ducts in a desmoplastic stroma (1A) showing positive immunostaining for pancytokeratin MNF116 (2B) and a low proliferative index as evidenced by MIB-1 staining (2C).



The lining epithelium of the ductules was positive for cytokeratin (MNF116) and negative for p53 (Figure 2). Immunostaining for epidermal growth factor receptor (EGFR) was also negative. Stromal cells were immunoreactive for vimentin and smooth muscle actin. MIB-1 immunostaining showed a mild increase in the proliferative index of the stromal cells only, and no mitotic activity was seen in ductular epithelium (Figure 2).

The overlying mucosa was severely inflamed and flattened. Regenerative changes were noted in the epithelium, but no evidence of dysplasia was identified. The muscularis propria was hypertrophic. Elsewhere, the gallbladder showed acute transmural inflammation, edema, vascular congestion and hemorrhage. Occasional Rokitansky-Aschoff sinuses were noted throughout the gallbladder wall.

The morphological features and the topographical distribution of these ductules were consistent with ducts of Luschka. Therefore, the final diagnosis of this cholecystectomy specimen was cholelithiasis, acute cholecystitis and florid ducts of Luschka. The entire gallbladder was examined histologically and no invasive malignancy was seen.

DISCUSSION

Bile ducts of Luschka (also called supravesicular ducts) are small bile ducts located within the gallbladder fossa ([4,5,6]). This region of the gallbladder is not covered by serosa and thus there is continuity of the connective tissue layer of the gallbladder with the interlobular connective tissue of the liver. Ducts of Luschka are a fairly common histological finding, being present in up to 10% of cholecystectomy specimens ([4,5,6]). Histologically they are small, less than 1 mm diameter, ductules lined by cuboidal biliary epithelium

often associated with a collar of fibrous connective tissue. The physiological function of these ductules is not known. They appear to be a normal variant of the biliary anatomy ([6]). It has been hypothesized that bile is perhaps reabsorbed into the liver through these ductules ([4,6]), however although these ducts may communicate with intrahepatic bile ducts they usually have blind distal ends and do not open into the gallbladder. Their surgical significance lies in the fact that they can be injured during cholecystectomy and are a well recognized cause of bile leak and biliary peritonitis in both adults and children ([4,5,6]).

The differential diagnosis of Luschka ducts includes both benign and malignant lesions, such as Rokitansky-Aschoff sinuses, adenomyomatous hyperplasia and well differentiated adenocarcinoma.

From a morphological point of view, the Rokitansky-Aschoff sinuses of the gallbladder are of the typical pulsion-type pseudodiverticuli consisting of pouches of mucosa projecting through and beyond the proper muscle layers of the gallbladder so that they come to lie in the subserosal layer ([1,2]). These glandular spaces are generally larger and the lining epithelium is taller than that found in Luschka ducts. Anatomically, the Rokitansky-Aschoff sinuses are linked to the gallbladder lumen, but ducts of Luschka are solely located in the advantitial connective tissue and do not open into the gallbladder. Adenomyomatosis of the gallbladder is histologically composed of groups of Rokitansky-Aschoff sinuses accompanied by thickening of the muscular and mucosal layers ([1,2]). Depending on the location and the extent of the lesion, it is generally divided into fundic, segmental and generalized types. The localized variants (fundic or segmental) are the most common and are also known as an adenomyoma ([1,2,3]).

The Luschka ducts must also be distinguished from well differentiated adenocarcinoma. As shown in the current case, this differential diagnosis may become particularly difficult when numerous glandular structures are present in an actively inflamed, desmoplastic appearing stroma. Macroscopically, adenocarcinoma of the gallbladder usually appears as a pale, grey-white mucosal mass infiltrating into the wall ([1,3]). However, occasional cases are detectable only as subtle thickenings of the gallbladder wall that may be very difficult to distinguish grossly from benign lesions such as xanthomatous cholecystitis ([7]) and adenomyomatous hyperplasia ([1,2]). Microscopically, adenocarcinoma of the gallbladder is characterized by invasive glandular structures formed by cytologically atypical cuboidal or tall columnar cells with intracellular mucin, occasional goblet cells and endocrine cells. An intense desmoplastic reaction surrounding the invading glands is characteristic and useful in distinguishing true invasion from mimics ([1,3]). Helpful clues that favor the diagnosis of benign Luschka ducts include their specific location within the non-peritonealized gallbladder fossa, a densely collagenous collar surrounding the ductules and the lack of a truly infiltrative growth pattern. The degree of cytological atypia and the mitotic activity in an invasive adenocarcinoma typically exceeds that seen in benign Luschka ducts. Furthermore, lymphovascular and perineural invasion as well as glandular foci with a less well differentiated appearance may be seen in carcinoma specimens when the tumor is adequately sampled.

Immunohistochemistry may be helpful in distinguishing adenocarcinoma from florid reactive and inflammatory epithelial changes. In contrast to normal epithelium or reactive epithelial changes associated with cholecystitis, high grade dysplasia and adenocarcinoma often show a high proliferative index and diffuse nuclear labelling for p53 ([8,9,10]). Consistent with this observation, the ductular epithelium in this case was completely negative for p53. A mild increase in the proliferative index was seen in the stromal cells, but no mitotic activity was noted in the ductular epithelium. While this data is supportive, we strongly believe that the differential diagnosis rests upon the hematoxylin and eosin (H&E) findings and an awareness of these morphological features by pathologists is imperative to prevent misdiagnosis.

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References

1. Albores-Saavedra J, Henson DE, Klimstra DS. Tumors of the gallbladder, extrahepatic bile ducts and ampulla of Vater. In: Atlas of Tumor Pathology, 3rd series. Washington, DC: Armed Forces Institute of Pathology, 2000.
2. Levy AD, Murakata LA, Abbott RM, Rohrmann Jr CA.

Benign tumors and tumorlike lesions of the gallbladder and extrahepatic bile ducts: radiologic-pathologic correlation. RadioGraphics 2002; 22(2):387-413.
3. Hansel DE, Maitra A, Argani P. Pathology of the gallbladder: a concise review. Cur Diagn Pathol 2004; 10(4):304-17.
4. Mcquillan T, Manolas SG, Hayman JA, Kune GA. Surgical significance of the bile duct of Luschka. Br J Surg 1989; 76(7):696-8.
5. Braghetto I, Bastias J, Csendes A, Debandi A. Intraperitoneal bile collections after laparoscopic cholecystectomy: causes, clinical presentation, diagnosis, and treatment. Surg Endosc 2000; 14(11):1037-41.
6. Sharif K, de Ville de Goyet J. Bile duct of Luschka leading to bile leak after cholecystectomy - revisiting the biliary anatomy. J Pediatr Surg 2003; 38(11):21-3.
7. Pantanowitz L, Goldar-Najafi A, Nasser I. Xanthogranulomatous choledochitis mimicking cholangiocarcinoma. Pathol Int 2004; 54(3):213-5.
8. Kamel D, Paakko P, Nuorva K, Vahakangas K, Soini Yl. p53 and c-erb-2 protein expression in adenocarcinoma and epithelial dysplasias of the gall bladder. J Pathol 1993; 170(1):67-72.
9. Oohashi Y, Watanabe H, Ajioka Y, Hatakeyama K. p53 immunostaining distinguishes malignant from benign lesions of the gallbladder. Pathol Int 1995; 45(1):58-65.
10. Wistuba II, Gazdar AF, Roa I, Albores-Saavedra J. p53 protein overexpression in gallbladder carcinoma and its precursor lesions: an immunohistochemical study. Hum

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