

Malignant Granular Cell Tumor of the Bile Duct

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ABSTRACT

A 56-year-old man presented to the emergency department with painless jaundice and weight loss. Abdominal ultrasound detected dilation of the common bile duct and the intrahepatic bile ducts. Follow-up with endoscopic retrograde cholangiography exposed a stricture of the common hepatic duct, with cholangioscopy identifying an infiltrating tumor. Biopsy revealed a granular cell tumor, which was confirmed by positive S-100 immunohistochemical staining. Surgical excision confirmed granular cell tumor of the bile duct with morphological features suggestive of malignancy.

INTRODUCTION

Granular cell tumors (GCTs) are thought to arise from Schwann-like mesenchymal cells. The most common location is the head and neck region; biliary tract GCT is rarely reported in the literature. GCT is almost always benign; however, malignant GCT has been described within the subcutis and dermis. Malignant biliary GCT has not been reported. Clinical and radiological presentation of GCT is similar to cholangiocarcinoma preoperatively, leading to extensive evaluation. However, biliary GCT is usually cured by complete excision alone, which is generally associated with good prognosis.

CASE REPORT

A 56-year-old African American man with a history of alcohol and tobacco use disorders presented with painless jaundice and weight loss. The patient stated that he had lost over 50 pounds during the past year. Physical examination was significant for scleral icterus, jaundice of the oral mucosal membranes, hepatosplenomegaly, ascites, and bilateral edema of the lower extremities. A hepatic function panel was notable for albumin of 2.6 g/dL, alkaline phosphatase of 957 IU/L, direct bilirubin of 4.7 mg/dL, total bilirubin of 7.7 mg/dL, aspartate aminotransferase of 98 IU/L, and alanine aminotransferase of 51 IU/L.

An abdominal ultrasound demonstrated severe intrahepatic biliary ductal dilatation measuring up to 1.1 cm on the left and 0.8 cm on the right, with the common bile duct measuring 1.5 cm. The gallbladder was distended with sludge with no findings of calculi. The liver measured 26 cm with homogenous parenchyma and no evidence of any masses. An endoscopic retrograde cholangiography (ERCP) was then performed. Deep biliary cannulation was achieved using a tapered catheter over a 0.018-in guidewire. After bile aspiration, the biliary tree was filled with dilute contrast. A subsequent cholangiogram revealed a stricture of the common hepatic duct (Figure 1). A small sphincterotomy was performed at the biliary orifice using a pull-type sphincterotome over a 0.025-in guidewire and a cutting current device. The stricture was dilated with a graduated tip dilator, with the largest dilator size being 10 Fr. Brushings from the stricture were taken, and a 10-Fr 12-cm straight plastic Cook stent (Cook Medical, Bloomington, IN) was placed within the bile duct. Cytology at the time was negative for malignancy, and no surgical intervention was planned at that time. A follow-up ERCP with cholangioscopy was planned for a visually directed biopsy of the mass.

During the follow-up ERCP, the straight plastic stent was found to be in place and was successfully removed by grasping the outer tip in the duodenum with a snare loop. Deep biliary cannulation was achieved using a sphincterotome over a 0.035-in guidewire,

and cholangioscopy was performed. Visualization of the common hepatic duct revealed an infiltrating tumor, with normal-appearing right and left hepatic ducts (Figure 2). Biopsy demonstrated clusters of cells with abundant granular cytoplasm highly suggestive of GCT (Figure 3). An immunostain for S-100 confirmed the diagnosis (Figure 4). Subsequently, the patient underwent resection of the extrahepatic bile duct with Roux-en-Y hepaticojejunostomy. The excised tumor was present throughout the distal bile duct and was

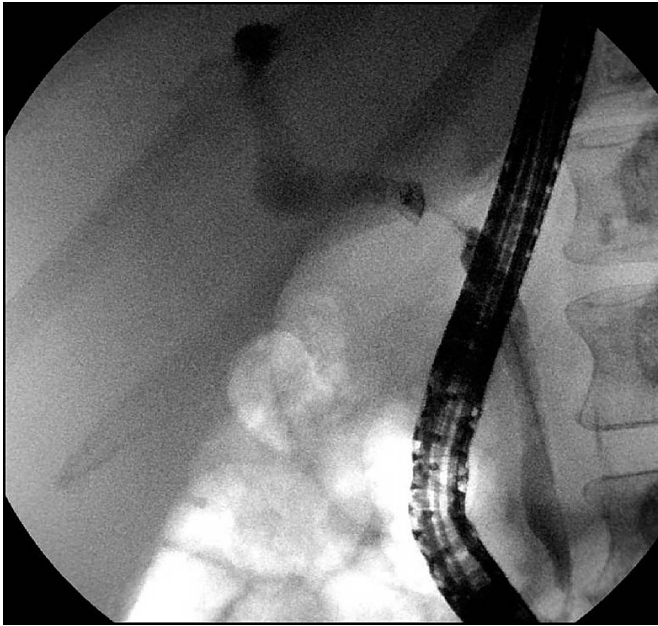


Figure 1. Endoscopic retrograde cholangiography demonstrating stricture of common hepatic duct.

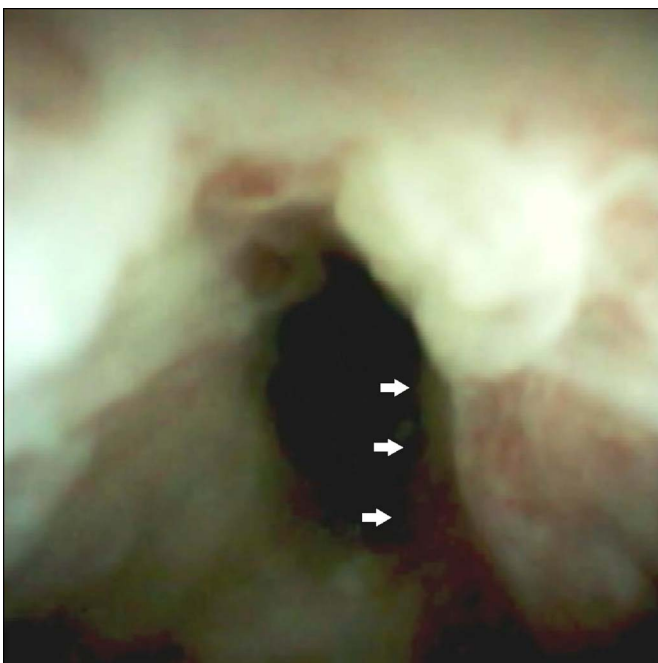


Figure 2. Infiltrating tumor (arrows) seen on cholangioscopy.

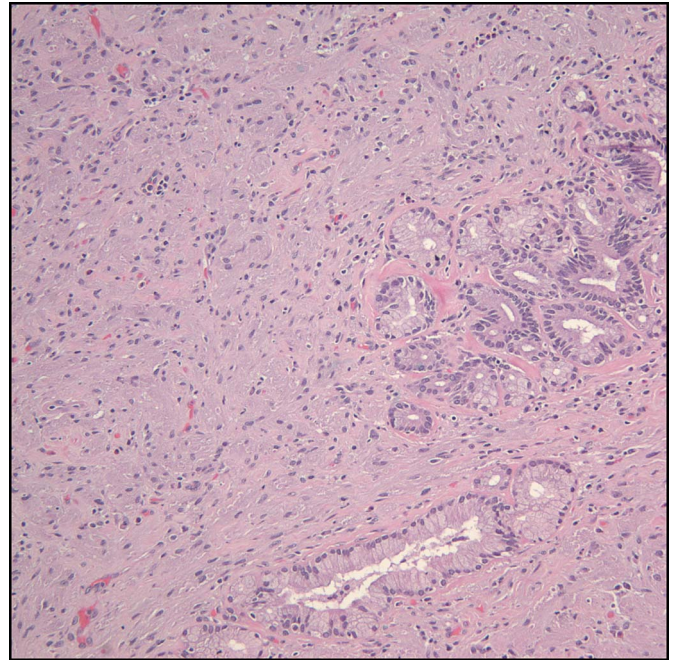


Figure 3. Hematoxylin and eosin stain (200×) of granular cell tumor surrounding the biliary epithelium.

estimated to be at least 3.5 cm. Surgical pathology confirmed GCT of the bile duct with morphological features suggestive of malignancy, including nuclear pleomorphism, high nuclear cytoplasmic ratio, and prominent and vesicular nucleoli (Figure 5). The patient's postoperative course was uneventful, and the patient has been asymptomatic 7 months postoperatively.

DISCUSSION

Originally termed granular cell myoblastoma due to the belief that they originated from striated muscle, GCTs are now thought to originate from Schwann-like mesenchymal cells.¹ Histologically, GCTs are composed of eosinophilic cells that contain cytoplasmic granules. They generally appear as clusters or sheets with diffuse infiltration around surrounding structures. Immunohistochemically, these tumor cells stain positively for Schwann cell-related antigens, including S-100 protein and vimentin.² Although extremely uncommon, about 2% of all GCTs have been described as malignant. These tumors exhibit rapid growth, a size greater than 4 cm, necrosis, pleomorphism, and increased mitotic index.³ Documented cases have been described within the subcutis and dermis. Our case appears to be the first published instance of malignant GCT within the biliary tree.

GCTs are uncommon and mostly benign soft tissue tumors, with Lack et al estimating an overall incidence of 0.03% after examining 410,000 surgical specimens over 32 years.⁴ After reviewing 110 cases at their institute, they found that GCTs arise predominantly within the tongue, skin, and subcutaneous tissues in patients aged 40–60 years.⁴ However, it

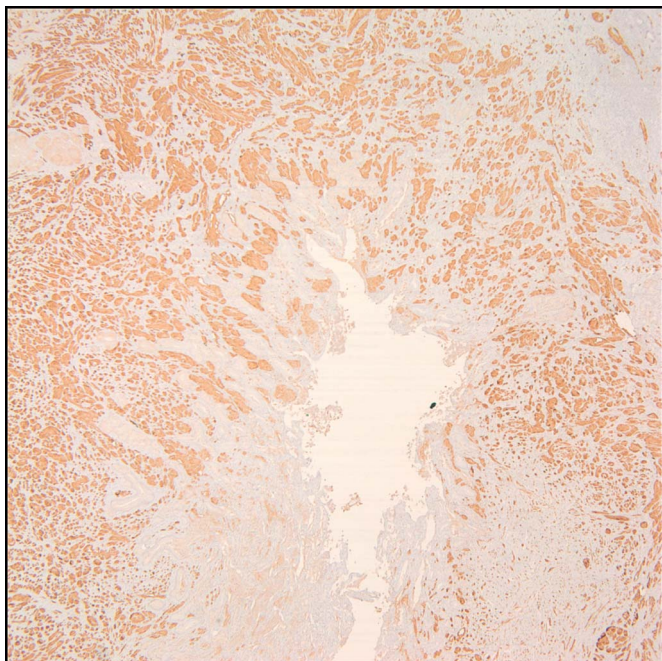


Figure 4. Immunostain positive for S-100 (40×).

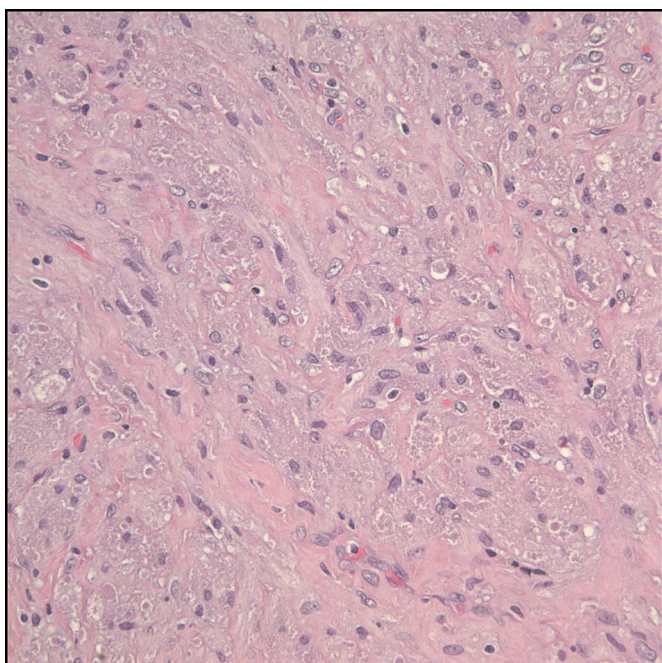


Figure 5. Hematoxylin and eosin stain (200×) showing nuclear pleomorphism, high nuclear-cytoplasmic ratios, and prominent nucleoli.

has been found that GCTs can originate anywhere in the body. Another study reviewing 74 cases of GCT estimated that 5%–11% of GCTs occur within the gastrointestinal tract, with the esophagus being the most commonly effected organ.⁵ Approximately 80 cases of biliary tract GCTs have been documented within the literature, representing less than 1%

of all GCTs. Nonetheless, GCTs are the most common benign nonepithelial tumor of the extrahepatic biliary tract.⁶

GCTs of the biliary tree are most commonly seen in young African American women. Our case differentiated from this conventional presentation with an African American man in his 50s. GCTs generally arise at the meeting of the cystic, hepatic, and common bile duct, often resulting in obstruction. Therefore, these patients typically present with either abdominal pain or jaundice.⁷ This is seen in our case as the patient presented with painless jaundice. Because of a presentation and imaging resembling gallstones or obstructing carcinoma, GCTs are rarely diagnosed preoperatively. Typical diagnostic tools used in the visualization of the biliary tree are nonspecific and unable to identify GCTs.⁸ This was evidenced in our case as the initial thought following ERCP was cholangiocarcinoma.

Because of its resemblance to malignant causes of strictures of the biliary tree, many patients with GCT are treated with extensive surgical treatments such as the Whipple procedure. However, treatment with surgical excision with tumor-free margins followed by hepaticojejunostomy has been found to be satisfactory in the treatment of GCTs.⁶ In addition, endoscopic stenting can be used as a temporary measure to alleviate obstruction in these patients. Reoccurrence is possible with positive margins, and patients should be followed postoperatively. Because of the malignant nature of our patient's tumor, follow-ups have been regularly scheduled every 6 months for the first 3 years postoperatively, then annually for the following 2 years. Thus far, our patient has had no complications or signs of reoccurrence 7 months following surgery.

DISCLOSURES

Author contributions: PL Quinn acquired data and wrote and edited the manuscript. E. Abdelfatah, MA Galan, SK Ahlawat, and RJ Chokshi acquired data and edited the manuscript. All authors approved the final version. RJ Chokshi is the article guarantor.

Financial disclosure: None to report.

Informed consent was obtained for this case report.

Received February 16, 2019; Accepted June 26, 2019

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