Case Report

Pure mucinous (colloid) adenocarcinoma of the gallbladder – a rare phenotype

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INTRODUCTION

Carcinomas with prominent stromal mucin deposition are rare in the biliary tract and ‘mucinous’ carcinomas in which extracellular mucin constitutes more than 50% of the tumor volume, are rarer still.[1,2] Those tumors in which the mucinous pattern comprises of at least 90% of the tumor are called ‘pure mucinous’ (colloid phenotype) carcinomas and are exceedingly rare in the gallbladder.[1,2] Approximately twenty cases of mucinous carcinoma (MC) of the gallbladder (GB) have been reported so far. We report a rare case of pure mucinous carcinoma of the gallbladder.

CASE HISTORY

A 55 year old woman presented with complaints of icterus for six months and dull aching pain in right hypochondriac region for ten days. She had history of pulmonary tuberculosis 30 years back which was cured with antitubercular treatment. She also had history of exposure to barium fumes in the past; however, details of the source and extent of exposure were not available. On examination, she had mild pallor and moderate icterus. Biochemical tests showed marked elevation of serum alkaline phosphatase (1363 U/L) with moderate increase in serum aspartate aminotransferase (316 U/L) and alanine aminotransferase (219 U/L). Ultrasonography revealed thickening of the GB wall, suggestive of carcinoma along with cholelithiasis and choledocholithiasis which was confirmed on CT scan and MRI. She underwent endoscopic retrograde cholangiopancreatography (ERCP) with stenting to relieve pain and biliary obstruction. Twenty days later, cholecystectomy with exploration of the common bile duct for stone removal was performed and the specimen was received piecemeal for histopathological examination. The specimen showed thickening of the wall with

ABSTRACT

Mucinous carcinomas are very rare in the biliary tract. Only twenty cases of mucinous carcinomas of the gallbladder have been reported so far of which the pure mucinous (colloid) phenotype is exceedingly rare. We report one such rare case of a 55 year old lady with history of exposure to barium fumes in the past, who presented to our hospital with features of biliary obstruction. Radiological examination revealed neoplastic thickening of the gallbladder along with cholelithiasis and choledocholithiasis. Cholecystectomy was performed and the specimen showed thickened gallbladder wall with a glistening grey white infiltrative growth. Microscopy showed pure mucinous (colloid) adenocarcinoma, the entire tumor being composed of pools of extracellular mucin with clusters of tumor cells floating in them with no other component.

Keywords: barium, colloid, cholelithiasis, gallbladder, mucinous adenocarcinoma.
the cut surface showing a grey white, focally glistening infiltrative growth [Figure 1]. Histopathological examination showed a tumor which was entirely composed of pools of extracellular mucin containing clusters of tumor cells [Figure 2]. The surrounding stroma showed extensive desmoplasia. A diagnosis of ‘pure mucinous (colloid) adenocarcinoma’ of the gallbladder was made.

**DISCUSSION**

A vast majority of the carcinomas of the GB are adenocarcinomas of the pancreatobiliary type while other subtypes such as papillary, clear cell and mucinous adenocarcinomas comprise the rest.[1,2] MCs are tumors in which extracellular mucin constitutes more than 50% of the tumor volume and are seen as mucin lakes containing scant clusters of floating carcinoma cells or signet ring cells.[1,2] These tumors are rare in the GB, and the mucinous pattern usually constitutes 50 to 90% of the tumor, admixed with areas of conventional adenocarcinoma, as often seen in the colon.[1,2] ‘Pure mucinous (colloid) carcinoma’, i.e. tumors with 90% or more mucinous pattern, as seen in the breast, are exceedingly rare in the gallbladder.[1–3] About twenty cases of MC of the GB have been reported so far. However, exactly how many of these had pure mucinous phenotype is unclear. Immunophenotypically, MCs differ from conventional gallbladder adenocarcinomas by MUC2 positivity, from intestinal carcinomas by an often inverse CK7/20 profile, from pancreatic mucinous carcinomas by CDX2 negativity, and from mammary colloid carcinomas by a lack of MUC6.[4] Unlike gastrointestinal MCs, they appear to be microsatellite stable.

In three recently published cases of MC of the GB,[5–7] the age was more than 45 years. Two of the patients were males and one was a female. Two had associated cholelithiasis while one had porcelain gallbladder. The tumor was diffusely infiltrating in two cases and in the other, it was located in the fundus of GB. In a recent analysis of 15 cases of MC of the GB,[4] the mean age was 65 years, and the female to male ratio was 1.1. A significant proportion of the cases (8 of 12, 67%) presented with the clinical picture and intraoperative findings that were interpreted as acute cholecystitis. Two cases had pure mucinous (colloid) pattern. Eight cases were of mixed-mucinous type, showing a mixture of colloid and noncolloid patterns. Five others had prominent signet-ring cells, both floating within the mucin (which constituted >50% of the tumor by definition) and infiltrating into the stroma as individual signet-ring cells in some areas.

Our patient was a 55 year old female with a diffusely infiltrating pure mucinous (colloid) adenocarcinoma and associated cholelithiasis.

Because of their extreme rarity, the risk factors, associated features, natural history and prognosis of MC of GB remain unknown. The risk factors for all GB carcinomas in general are gallstones, calcified “porcelain” gallbladder, choledochal cysts, polypoid lesions of the GB, sclerosing...
cholangitis, anomalous pancreaticobiliary duct junction, and exposure to carcinogens such as methylcholanthrene, O-aminoazotoluene and nitrosamines. Association with barium exposure is, however, not known. Emissions of barium may result from mining, refining, or processing of barium minerals, manufacturing of alloys, paper, soap, rubber, valves and linoleum, and as a component of welding fumes. Barium is also discharged in waste water from metallurgical and industrial processes. Inhalation of finely ground barium salts or fumes can lead to baritosis – a pneumoconiosis; however, there is no evidence till date that barium is carcinogenic. Though our case had history of exposure to barium fumes in the past, the significance of this association cannot be ascertained as yet.

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REFERENCES


