Case Report

Gall bladder heterotopia: Uncommon two cases and review of variations

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Abstract

Background and Objectives: Heterotopia in the gallbladder is a rare condition where normal tissue occurs in an abnormal location. This case report aimed to describe two cases of heterotopia in the gallbladder, one with gastric mucosa and the other with pancreatic tissue. The objective is to provide a better understanding of the clinical presentation, histological findings, and associated anomalies of heterotopia in the gallbladder.

Materials and Methods: The cases were identified through patient records and macroscopic examination. Clinical data, radiological findings, and histopathological analysis were collected and analyzed.

Results: *Case 1* presented with intermittent abdominal pain and was diagnosed with cholelithiasis. Gross examination revealed a gallbladder with ulcerated mucosa and a cystic area. Histological examination confirmed the presence of gastric heterotopia. *Case 2* underwent laparoscopic cholecystectomy for a firm lesion in the neck of the gallbladder. Histopathological analysis showed chronic cholecystitis and heterotopic pancreatic tissue.

Conclusion: Heterotopia in the gallbladder is a rare condition associated with various types of heterotopic tissues. Gastric heterotopia is the most common type, followed by pancreatic, hepatic, thyroid, and adrenal heterotopias. The exact cause of heterotopia in the gallbladder is unknown, but it is believed to be a congenital disorder. Treatment options vary, and further studies are needed to understand the incidence and development of heterotopia in the gallbladder.

Keywords: Congenital disorder, gallbladder, gastric mucosa, heterotopia, pancreatic tissue

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Received: 30-03-2023, **Accepted:** 25-07-2023, **Published:** 29-11-2023

INTRODUCTION

Heterotopia refers to the occurrence of normal tissue in abnormal locations.[1] Despite its presence in almost every part of the gastrointestinal tract, heterotopic gastric mucosa in the gallbladder is rare.[2] The first case of this condition in the gallbladder was described by Egyedi in 1934.[3] Most patients with gastric heterotopia experience abdominal pain, with a median age of 36.6 years. The body-fundic type of heterotopic gastric mucosa is the most observed (60% of cases).[4]

Pancreatic heterotopia is considered a congenital disorder resulting from abnormal development of the embryonic foregut. It is often associated with conditions such as congenital choledochal cyst, enteric duplication cyst, and duplication of the gallbladder. This condition primarily affects adults, with a male-to-female ratio of 2:1.

Access this article online	
Quick Response Code:	Website: https://journals.lww.com/njgh
	DOI: 10.4103/njgh.njgh_2_23

How to cite this article: Robbi M, Chakravarthy RP, Rao Lomte JK, Madhuri V. Gall bladder heterotopia: Uncommon two cases and review of variations. Niger J Gastroenterol Hepatol 2023;15:52-6.

In contrast, hepatic heterotopia, including its occurrence in the gallbladder, is estimated to affect 0.24% to 0.47% of the population.[5,6] However, it remains challenging to evaluate accurately. The exact cause of heterotopia in the gallbladder is still unknown, but it is believed to be a congenital disorder. This paper presents two case reports of heterotopic gallbladder, highlighting this rare condition and providing insight.

CASE REPORT 1

An 18-year-old patient presented with intermittent abdominal pain of 15 to 20 days. She had mildly elevated transaminases with other laboratory evaluation within normal limits. Sonographic findings demonstrated partially distended gall bladder with echogenic sludge and calculus measuring 11 mm × 12 mm. Our diagnosis was cholelithiasis and she had laparoscopic cholecystectomy. Gross examination of the specimen showed a gall bladder measuring 6 cm × 2 cm. The gallbladder external surface was pale, the mucosa was ulcerated and there was a cystic area in the wall measuring 1 cm × 1 cm × 1 cm, the cyst was hemorrhagic and filled with central brownish material, wall thickness measured 0.2 to 1 cm. No stones were found [Figures 1A and B].

The histological examination showed a well-defined area in the gall bladder that contained gastric heterotopia. This tissue is surrounded by muscle and contains a central space filled with a uniform, reddish homogeneous material.

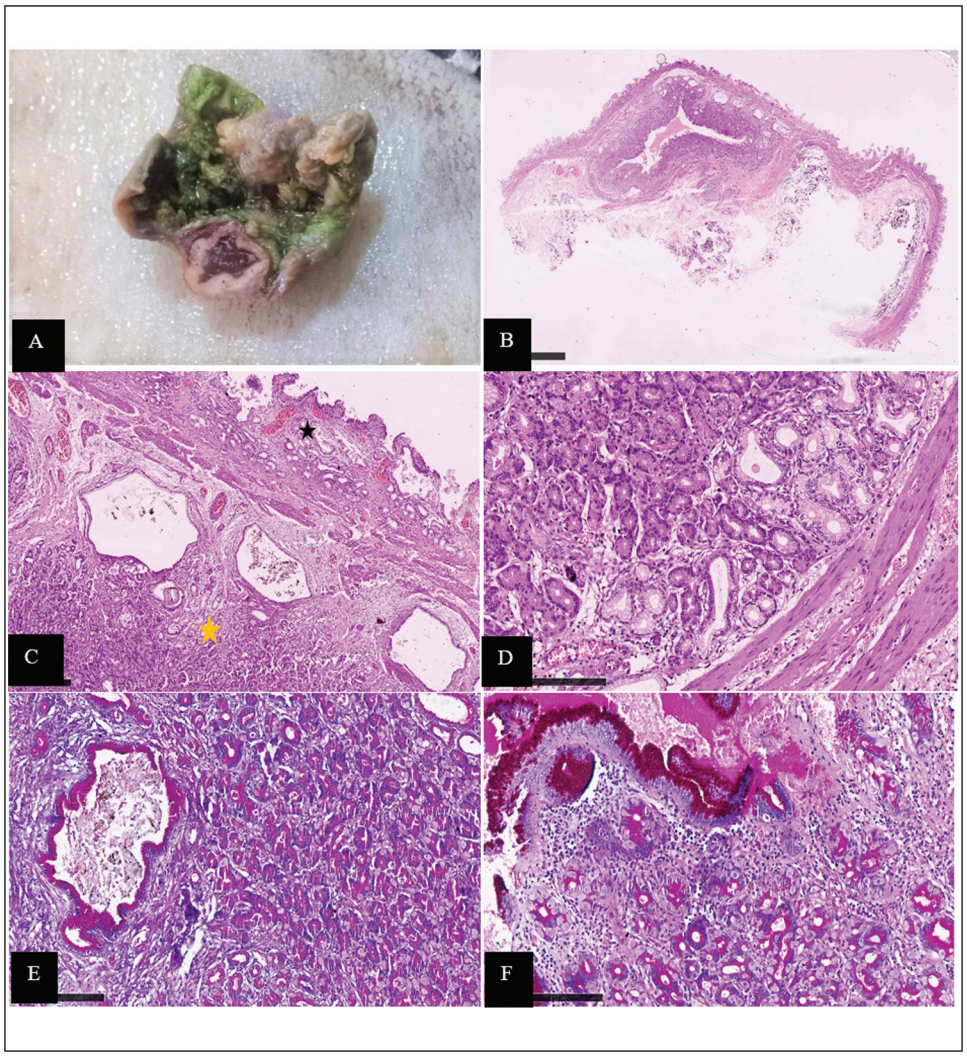

Figure 1: A series of histopathological images illustrating heterotopic tissue in the gall bladder. (A) A macroscopic image displays the gall bladder with a cystic lesion characterized by a thick wall and a central cyst filled with hemorrhage. (B) Providing a comprehensive perspective, a whole-mount view of the gall bladder with the cystic region is presented, with a scale bar of 5mm for reference. (C and D) Microscopic examination using Haematoxylin and eosin (H&E) staining reveals the presence of gastric heterotopia, featuring well-defined glands and gastric foveola (*) within the tissue, with a scale bar of 250 µm. (E and F) Further analysis using Alcian Blue/Periodic Acid–Schiff (ABPS) staining shows that the foveolar mucosa exhibits neutral characteristics, being Periodic Acid–Schiff (PAS) positive while Alcian Blue negative, with a scale bar of 250 µm. This image was acquired using a Nano Zommer from Hamamatsu.

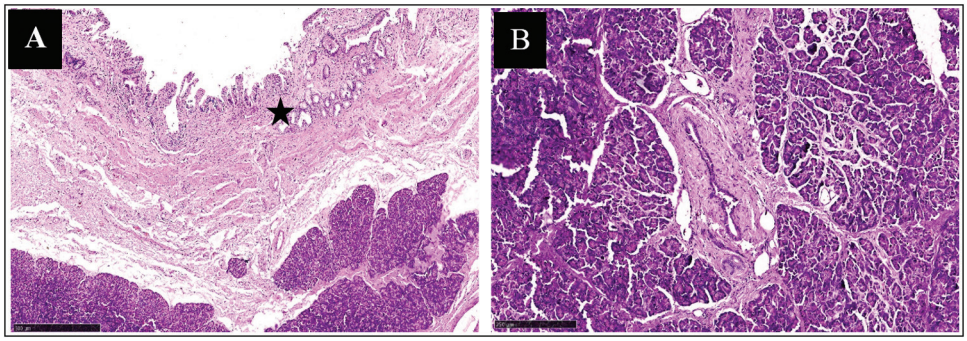

Figure 2: Microscopic images depicting pancreatic heterotopia within the gall bladder. (A) A digital slide image illustrates the presence of pancreatic tissue within the gall bladder, with a clear demarcation of the gall bladder mucosa denoted by (*). The scale bar is set at 500 µm. (B) Digital slide image showcases a duct within the pancreatic heterotopia along with adjacent pancreatic acini. This image was acquired using a Nano Zommer from Hamamatsu and scaled with a 500 µm reference bar for accurate measurements.

The tissue also has foveola, facing the central space and the surrounding muscle. The glands between the foveola contain cells that stain purplish (chief cells) and light pink (parietal cells) [Figures 1C-F].

CASE REPORT 2

A 33-year-old woman had a laparoscopic cholecystectomy and biopsy of a firm lesion in the neck of her gall bladder. The macroscopic findings showed that a partially excised gall bladder with a size of 6.5 cm × 3 cm × 1 cm has been received. The inner surface of the gallbladder appears velvety, and its wall thickness was 0.4 cm. Additionally, a small piece of soft tissue measuring 1 cm × 0.8 cm × 0.8 cm was also present.

The biopsy shows evidence of chronic cholecystitis, including sloughed-off mucosa, pyloric metaplasia, lymphocyte and plasma cell aggregates, smooth muscle hypertrophy, fibrosis, Rokitansky-Aschoff sinuses, and a chronic inflammatory infiltrate of lymphocytes and plasma cells. The section examined from the neck of gall bladder demonstrated pancreatic tissue organized into lobules, with the parenchyma within the lobules comprising acini and ducts, but no obvious islets of Langerhans were identified. The acini were spherical or tubular glands composed of secretory cells with granular cytoplasmic appearance. The duct system was composed of main, interlobular, intralobular, intercalated ducts, and centroacinar cells, with a few ducts showing squamous metaplasia. No atypical cells or malignancy is identified. The findings suggest chronic cholecystitis and heterotopic pancreatic tissue in the neck of the gall bladder [Figures 2A and B].

DISCUSSION

There are several types of heterotopias that can occur in the gallbladder. Gastric heterotopia, the most common type of heterotopia in the gallbladder, refers to the presence of gastric mucosa, or the lining of the stomach, in the gallbladder. This condition can occur in both adults and children and can present in various forms, including polyps, cysts, or nodules. The exact cause of gastric heterotopia in the gallbladder is unknown, but it is thought to be a congenital disorder.

Patients with gastric heterotopia are reportedly mostly young, with a median age of 36.6 years and a range of 3–80 years. Most patients (74.3%) present with abdominal pain, 50% describing it as colicky and 15% describing it as mild. Half of the patients with abdominal pain had a history of the symptom lasting more than 3 months. Other symptoms reported by patients included nausea (31.4%), jaundice (11.4%), and a quarter of the patients were asymptomatic. The gallbladder masses were found to have a mean diameter of 1.6 cm, ranging from 0.5 to 3 cm. Most of the masses were in the lower gallbladder, particularly in the gallbladder neck.[4]

Most Gastric heterotopia (60%) revealed heterotopic gastric mucosa of body-fundic type, which includes chief and parietal cells. Pyloric-type glands (20%) were the second most common, followed by antral-type mucosa (11.4%). Body mucosa (5.7%) and cardia-type mucosa have not been reported. Some patients (11.4%) revealed a mixed histologic finding with both fundic, and pyloric glands and one patient (0.3%) showed fundic and antral cells.[4] In 28.6% of cases, inflammation was reported and in half of those cases fibrotic findings were also present.[4]

Hepatic heterotopia can occur in various sites, such as the gallbladder, hepatic ligaments, omentum, retroperitoneum, and thorax. The most common location is on the surface of the gallbladder. The exact incidence of this condition is difficult to assess, but it is estimated to occur in 0.24% to 0.47% of the population.[5,6]

There are several theories that have been proposed to explain the development of ectopic liver, including the formation of an accessory lobe of the liver, migration or displacement of liver tissue, entrapment of hepatocyte-destined mesenchyma, and trapping of cells in the region of the foregut.[7-11] The vascular supply of gallbladder-associated ectopic liver tissue is not well understood, with three different theories proposed. Surgical intervention is necessary to determine the exact vascular supply and avoid bleeding during surgery.[12-16]

Hepatic heterotopia tissue resembles normal liver tissue in its histology, with regular lobules, central veins, and normal portal areas. However, there have been reported cases of unusual architecture with the absence of the hexagonal lobule pattern. Ectopic liver tissue can undergo various changes such as fatty changes, hemosiderosis, cirrhosis, hepatitis, or malignant degeneration to hepatocellular carcinoma (HCC). The risk of HCC is increased in ectopic liver tissue compared to the main liver, but the exact reason for this is unclear. Many cases of HCC related to ectopic liver tissue are not associated with cirrhosis in the main liver.[17]

Pancreatic heterotopia in the gallbladder is a condition in which pancreatic tissue is found in the gallbladder. Pancreatic heterotopia was first described by Poppi in 1916.[18] We reviewed cases from India and found that all patients are predominantly adults with age ranging from 3 months to 63 years old, and male to female ratio is 2:1. All cases involved cholecystitis, cholelithiasis, or both present. Nearly 50% of cases also have associated anatomical anomalies such as congenital choledochal cyst (CC), enteric duplication cyst (EP), Choledochal Cyst type IVA, and duplication of the gallbladder. The lesions are found in various locations within the gallbladder, including the neck region and fundus area. This condition is believed to be a congenital disorder, resulting from abnormal development of the embryonic foregut.[19-21]

Thyroid heterotopia is a rare congenital condition in which thyroid tissue is present outside of its normal location in the neck. One of the rarest sites of ectopia is gallbladder. It is characterized by the presence of thyroid tissue in the gallbladder wall. Analyzing them showed that all cases involved adult patients, with a range of ages from 29 to 76 years old and all of them were female. The ectopic thyroid tissue was found in various locations within the gallbladder, including the neck region and fundus area. In all cases, the patients had cholecystitis or cholelithiasis present, and no associated anatomical anomalies were reported.[22-26]

The ectopic thyroid tissue was composed of colloid-filled follicles lined by cuboidal to flattened cells with bland nuclei and no cellular or architectural atypia was noted. Immunohistochemistry staining for thyroglobulin and thyroid transcription factor-1 (TTF-1) was performed in some cases and showed cytoplasmic staining of the follicular cell and the colloid. Follow-up for 2.5 years in one patient revealed no thyroid nodules or suspicious enlarged lymph nodes, and no other symptoms or complications were reported.[22-26]

Adrenal heterotopia reported case was a well-encapsulated nodule composed mainly of zona fasciculata type cells. The proximity of such rests to internal genitalia and kidneys can be explained by the development of adrenals from mesothelial cells and their larger size in fetal life. However, the presence of heterotopias in the absence of normal adrenals is less easily explainable. Other reported cases of ectopic adrenal tissue include suprarenal sittings, intrapulmonary adrenal rests, and adreno-renal or adreno-hepatic heterotopias.[27]

There is currently no consensus on the best treatment for heterotopia in the gallbladder. Some experts recommend surgical removal of the gallbladder, while others suggest a wait-and-see approach, with close monitoring and repeat imaging to ensure the lesion is not growing. The decision on treatment will depend on the size and location of the lesion, as well as the patient's symptoms and overall health.

It is important to note that heterotopia in the gallbladder is a rare condition and the incidence is very low. Not much is known about the natural history of this condition and the long-term outcomes are not well studied. However, with the increasing use of advanced imaging techniques, heterotopia in the gallbladder is being diagnosed more often.

CONCLUSION

We report two cases of heterotopic gallbladder, one with gastric mucosa and one with pancreatic tissue. These are rare conditions that can cause abdominal pain and complications such as cholecystitis and cholelithiasis. The diagnosis is usually made after histopathological examination of the resected gallbladder. The treatment of choice is cholecystectomy, which provides relief of symptoms and prevents further complications.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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