Heterotopic Ossification of the Gallbladder Associated with Chronic Cholecystitis: A case Report

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Abstract
Heterotopic ossification in the gall bladder is a rare condition, with few reported cases. Its pathogenesis remains unclear, though chronic inflammation may predispose to the condition. An 18-year-old girl underwent laparoscopic cholecystectomy due to persistent upper quadrant pain, nausea, and postprandial vomiting. Preoperative ultrasound revealed a polyp with features of cholecystitis. The post-operative course was uneventful. Histopathological examination showed fibromuscular hyperplasia, infiltration of chronic inflammatory cells, including foamy histiocytes, in the lamina propria. Rokitansky–Aschoff sinuses were present. The polypoid area exhibited denuded epithelium, mature bone formation, and marrow elements without evidence of metaplasia, dysplasia or malignancy.

[Journal of Histopathology and Cytopathology, 2025 Jul; 9 (2):111-113]
DOI: https://www.doi.org/10.69950/jhc2025v9i2s7

Keywords: Heterotopic ossification, gall bladder, Chronic cholecystitis

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Introduction

Heterotopic ossification is rarely discovered during histopathological evaluation of cholecystectomy specimens. Persistent irritation and presence of chronic inflammation have been proposed as potential risk factors for metaplastic changes of mesenchymal stromal cells within the gallbladder wall or the deposition of calcium in necrotic or fibrotic tissue, followed by subsequent bone formation.

Case Report

A 18-year-old female presented to a tertiary care outpatient department with complaints of persistent intermittent right upper quadrant abdominal pain. The pain was not radiating, associated with nausea and postprandial vomiting. She had no history of fever, chills, rigor, altered bowel habits, or urinary symptoms. Laboratory investigations, including complete blood count, liver function tests, Urine analysis, and upper gastrointestinal endoscopy, were unremarkable. Ultrasound examination revealed a polyp in the gall bladder with features of chronic cholecystitis. The patient underwent laparoscopic cholecystectomy. The excised gall bladder measured 7x3 cm with a wall thickness of 0.3 cm. The mucosa appeared greenish with a 0.4 cm polypoid structure. No gallstones were identified. Histopathological analysis revealed infiltration of chronic inflammatory cells, fibrosis, and thickening of the muscularis, including foamy histiocytes in the lamina propria. Rokitansky–Aschoff sinuses were present. The polypoid focus showed denuded epithelium, mature bone formation, and bone

marrow elements. No evidence of malignancy was noted.

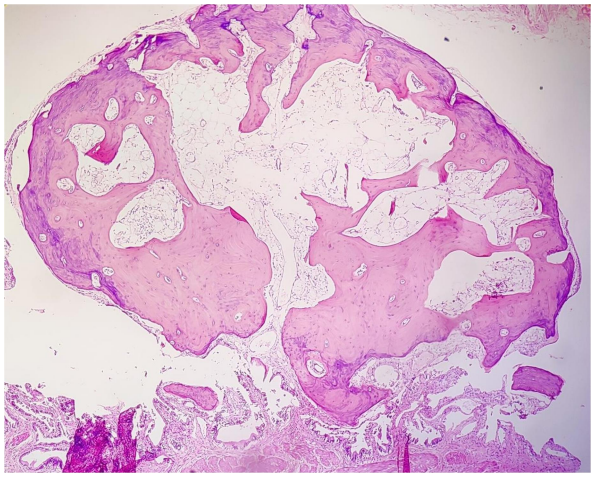

Figure 1. Showing bone and marrow elements covered by gall bladder mucosal epithelium

Discussion

Heterotopic ossification in the gall bladder is an exceedingly rare finding in the gall bladder wall, with fewer cases reported in the literature.[1-8] Indyk and shipton[2] described bone metaplasia in the gall bladder with subsequent cases[1-8] highlighting a relationship with chronic cholecystitis and cholesterol polyps. Of the reported cases, four were associated with cholelithiasis, and two involved ossification within cholesterol polyps. [1,4,6]

Rege and Vargas [8] reported intramuscular fasciitis-like proliferation in the gall bladder, while Chen[7] documented gallbladder osteomas. The other cases are heterotopic ossification without cholelithiasis. Yosepovich et al.[5] also described heterotopic bones in the gall bladder mucosa. In some cases, heterotopic bone with marrow elements was found, while others only showed osteoblastic rimming without marrow components. All the patients were adults; only Rege et al.[8] reported a unique case in a 7-year-old boy with sickle cell disease.

There are also two cases of metastatic gall bladder carcinoma showing stromal osseous metaplasia.[9,10,11] Micseh et al.[11] reported osseous metaplasia in both primary and secondary tumors, while Semra dogan noted cholecystitis associated with osseous metaplasia.[9] Laurens et al.[12] described ossification in the context of cholelithiasis without features of cholecystitis.

Normal subepithelial connective tissue in the gall bladder does not typically respond to osteogenic stimuli, likely due to the absence of intrinsic osteogenic properties. However, chronic inflammation and stromal fibroblastic activity may facilitate bone formation under specific pathological conditions.[9]

Conclusion

This report highlights a rare case of heterotopic ossification in the gall bladder associated with chronic cholecystitis. While the findings were incidental and of unclear clinical significance, the case underscores the potential role of chronic inflammation and stromal activity in promoting osteogenesis within the gallbladder mucosa. Further studies are required to elucidate the clinical implications and pathogenesis of this rare phenomenon.

Disclosure

The authors declared no competing interest

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