

## Case Report

### Limy bile syndrome or milk of calcium bile: An unexpected encounter

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#### ABSTRACT

**Introduction:** Limy bile or milk of calcium bile caused due to precipitation of calcium salts in bile is an extremely rare condition of gall bladder, wherein the lumen of gall bladder is filled with chalky white paste like material. Not many cases have been reported till date.

**Aim:** In this exceptional case, we tried to correlate the radiological and surgical findings with the histopathology.

**Case study:** We hereby present an interesting case of a 59-year-old male who presented with dyspepsia and painful abdomen and was finally diagnosed with limy bile syndrome.

**Results and discussion:** The etiology of this rare entity is not fully understood, but it certainly has strong association with impacted stone at the neck of gall bladder and hyperparathyroidism. Females are more commonly affected than males. Patients usually present with complaints of painful abdomen and are commonly diagnosed radiologically, as a radiopacity in gall bladder. Cholecystectomy is the preferred method of treatment for this unusual condition and histopathologically chronic cholecystitis is seen along with presence of slender needle shaped crystals of calcium salts.

**Conclusions:** A thorough evaluation of the clinikoradiological and histopathological findings can sometimes bring to light many uncommon variants of common looking pathologies.

## 1. INTRODUCTION

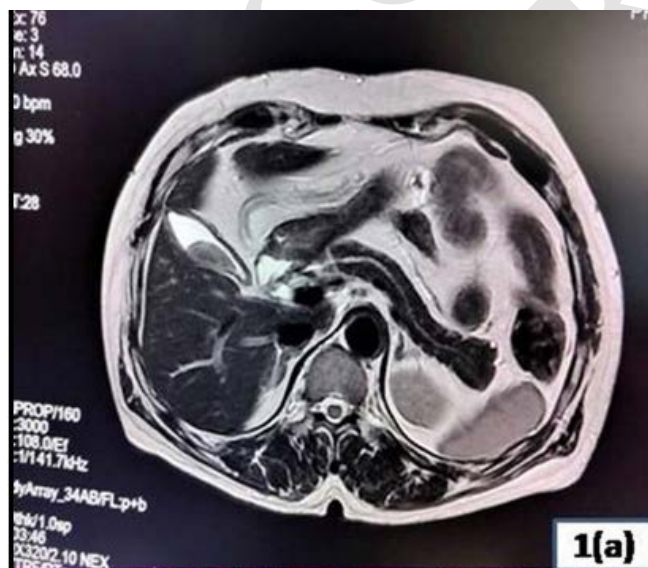
The contents of gall bladder may be of varied consistency, ranging from liquid to semi solid and solid. In liquid form the contents may be normal bile, mucocele and empyema. Different pigment stones and cholesterol stones may be present as solid contents. Apart from these more common findings, sometimes thick and mud like gall bladder sludge and even rarely semi solid deposits of calcium salts may be seen in the gall bladder. One such rare content of gall bladder is limy bile. Limy bile or milk of calcium bile is a very rare condition in which the gall bladder and uncommonly the common bile duct are filled with chalky white paste like radiopaque material. It is caused by precipitation of calcium salts in bile, especially calcium carbonate. It was described for the first time by Churchman in 1911 and around 300 cases have been reported since then.<sup>1</sup> Females are more commonly affected than males and individuals aged above 40 years have a higher predilection for this disease.<sup>2</sup> This condition is prevalent in 0.1% to 1.7% of patients who undergo cholecystectomy for cholelithiasis.<sup>3</sup> Most often this condition is a radiological diagnosis causing opacification of the gall bladder or the bile duct.<sup>2,4</sup>

## 2. AIM

We are hereby reporting an interesting case of limy bile in a male patient and tried to correlate the radiological and surgical findings with the histopathology.

## 3. CASE STUDY

A 59-year-old male patient came to the emergency department of our institute with complaints of dyspepsia and painful ab-



**Figure 1.** Magnetic resonance cholangiopancreatography image shows picture of chronic cholecystitis with sludge aggregate in gall bladder lumen, non dilated common bile duct and intrahepatic biliary radicals with clear lumen.

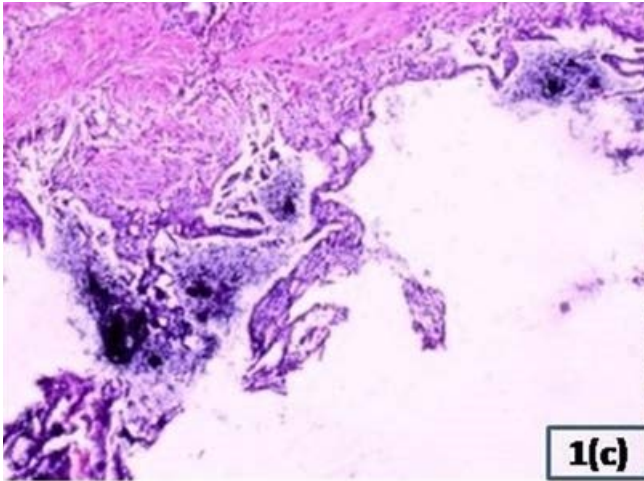
domen. There was no history of fever or vomiting. Laboratory investigations revealed that his liver enzymes, pancreatic enzymes, lipid profile, serum calcium and complete blood counts were within normal limits. Ultrasonography was done and reported as suspicious of mucocele of gall bladder with cholelithiasis and sludge aggregate in gall bladder lumen. Magnetic resonance cholangiopancreatography revealed picture of chronic cholecystitis with sludge aggregate in gall bladder lumen, non-dilated common bile duct and intrahepatic biliary radicals with clear lumen (Figure 1). The patient was managed surgically with laparoscopic cholecystectomy and adhesiolysis. The cholecystectomy sample was sent for histopathological evaluation. While grossing, the cut section of the sample showed chalky white paste like material mixed with bile (Figure 2). Microscopically we found features of chronic cholecystitis. The luminal aspect showed mucosal erosion and numerous rod shaped slender crystals (Figures 3 and 4). Hence a diagnosis of chronic cholecystitis with limy bile (milk of calcium bile) was made. The patient was discharged on the 3rd postoperative day without any complications. Currently he is under observation and is doing fine.

## 4. RESULTS AND DISCUSSION

Limy bile syndrome is an extremely rare entity, the etiology of which remains unknown. Impacted stones at the neck of the gall bladder and hyperparathyroidism are the two factors which have been most commonly associated with this condition.<sup>4,5</sup> Ever since this condition has been reported by Churchman in 1911, only about 300 cases have been reported in literature.<sup>1</sup> Individuals above 40 years of age, especially females are more commonly affected.<sup>2</sup> There is precipitation and crystallization of calcium carbonate in the gall bladder.<sup>6</sup> This leads to formation of putty like mate-



**Figure 2.** Grossly the cut section of gall bladder shows chalky white paste like material mixed with bile.

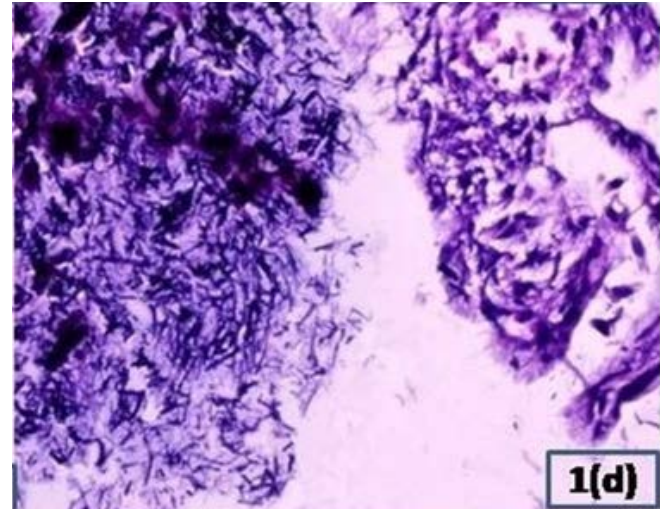


**Figure 3.** Photomicrograph show gall bladder mucosa showing features of chronic cholecystitis and crystals in the lumen (HE 100×).

rial in the gall bladder which is radiopaque in nature.<sup>1</sup> It is very difficult to differentiate limy bile from cholelithiasis ultrasonographically as it happened in our case.<sup>7</sup> Patients may come with vague complaints, may be diagnosed incidentally during radiography or may present with painful abdomen.<sup>3,6</sup> At times they may also present with complications like cholecystitis, cholelithiasis and obstructive jaundice due to the accompanying presence of cholelithiasis.<sup>4,8</sup> Cholecystectomy still remains the treatment of choice for limy bile of the gall bladder but in cases where the common bile duct is involved, common bile duct exploration with T-tube placement is required.<sup>9</sup> Histopathologically, chronic inflammatory condition of the gall bladder is most prevalent.<sup>10</sup> There is no clear-cut association of biliary or gall bladder malignancy with this condition and general consensus is surgical management once limy bile syndrome is suspected or diagnosed.<sup>2</sup>

## 5. CONCLUSIONS

- (1) Limy bile or milk of calcium bile is an exceptionally rare condition of the gall bladder and at times the common bile duct, characterized by presence of chalky white precipitates of calcium carbonate in these organs.
- (2) It is most commonly detected radiographically as a radiopacity in the gall bladder or common bile duct lumen, but can also be an incidental finding during cholecystectomy. Surgical management is the main modality of treatment.
- (3) We hereby present an extremely unusual case of limy bile syndrome diagnosed by presence of chalky white material in the gall bladder lumen grossly and slender needle shaped crystals microscopically. It is mostly reported in females, however here we are reporting a male patient having limy bile syndrome, which is even rarer.



**Figure 4.** Photomicrograph show mucosal erosion and numerous rod shaped slender crystals (HE 400×).

## Conflict of interest

Authors declare that they have no conflicts of interest.

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