

# Post ERCP Cholecystitis Managed Successfully with Intravenous Amino Acid Infusion: A Case Report

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## Abstract

Cholecystitis is a rare complication of ERCP. A history of acute pancreatitis, history of chronic cholecystitis, gallbladder opacification, biliary metal stent placement, and high leukocyte counts before ERCP were established as potential risk factors for the occurrence of PEC. Identifying the risk factors for PEC may help prevent this adverse event. Intravenous amino acid infusion causes a dose related emptying of the gallbladder. High dose amino acid infusion associated with significant release of CCK from gut either directly or indirectly. CCK causes contraction and emptying of gallbladder. Amino acid infusion can be used to clear the contrast and prevent cholecystitis following ERCP.

**Keywords:** ERCP; PEC; Risk factors; Amino acid

## 1. Abbreviations

ERCP: Endoscopic retrograde cholangiopancreatography; CCK: cholecystokinin; PEC: post ERCP cholecystitis

## 2. Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) is widely used in diagnosing and treating of biliary and pancreatic diseases. Possible ERCP-related adverse events include acute pancreatitis, hemorrhage, perforation, cholangitis, and acute cholecystitis. It can lead to purulent cholecystitis and result in emergency operation or percutaneous transhepatic gallbladder drainage. Identifying the risk factors for post ERCP cholecystitis (PEC) may help prevent this adverse event. A history of acute

pancreatitis, history of chronic cholecystitis, gallbladder opacification, biliary metal stent placement, and high leukocyte counts before ERCP were established as potential risk factors for the occurrence of PEC. High dose amino acid infusion associated with release of cholecystokinin (CCK) from gut either directly or indirectly. CCK causes contraction and emptying of gallbladder. Amino acid infusion can be used to clear the contrast entered into gall bladder during ERCP and prevent cholecystitis following ERCP.

### 3. Case Presentation

A 16-year-old girl presented with insidious onset and progressive jaundice with pruritus and clay-colored stools for one week. There was no history of pain abdomen or fever. Her liver function tests showed conjugated hyperbilirubinemia (Total bilirubin- 11 mg/dL; Direct- 10 mg/dL) and serum alkaline phosphatase was 668 U/L (4 times ULN). The ultrasound of the abdomen showed cholelithiasis with dilated common bile duct (CBD) (diameter of 12 mm at hilum); distal CBD was obscured. MRI with MRCP showed cholelithiasis and lower CBD stone with dilatation of CBD and intrahepatic biliary radicles. She underwent elective ERCP. Cholangiogram revealed lower end CBD stricture with a filling defect above it along with a low insertion of cystic duct and contrast opacification of gall bladder (GB). Stricture was dilated with a CRE balloon, and two double pigtail (10 F and 7 F) stents were placed in the CBD across the stricture. She was started on antibiotics prophylactically for the prevention of post ERCP cholecystitis. She was kept nil per orally. On day 2 post-procedure, she reported right upper abdominal pain and fever. Murphy's sign was positive. Abdominal X-ray showed persistence of contrast in the GB. Ultrasound examination of abdomen showed a distended GB with thickened GB wall and sonological Murphy sign positivity. She was started on prokinetics (metoclopramide) with no response. We chose to treat her with amino acid infusion (TABLE 1) administered at a rate of 500 mg/kg/hr to aid clearance of contrast from GB. Post infusion abdominal X ray was repeated which showed complete clearance of contrast from GB and clinical resolution of symptoms. She was discharged after 24 hrs. She is doing well one month after the procedure and underwent elective laparoscopic cholecystectomy (FIG 1 & 2).

TABLE 1. Amino acid solution composition.

Isoleucine	0.5 g
Leucine	0.74 g
Lysine acetate	0.95 g
Lysine	0.66 g
Methionine	0.43 g
Phenylalanine	0.51 g
Threonine	0.44 g
Tryptophan	0.2 g
Valine	0.62 g
Arginine	1.2 g
Histidine	0.3 g
Alanine	1.4 g
Glycine	1.1 g
Proline	1.1 g

Serine	0.65 g
Tysorine	0.04 g
Taurine	0.1 g
Total aminoacids	100 g/L
Total nitrogen	16.2 g/L
Total energy	1680 KJ/L
Ph	5.5-6.3
Titration acidity	22 mmol/L
Theoretical osmolarity	930 mosm/L



FIG. 1. Cholangiogram showing opacification of the gall bladder.

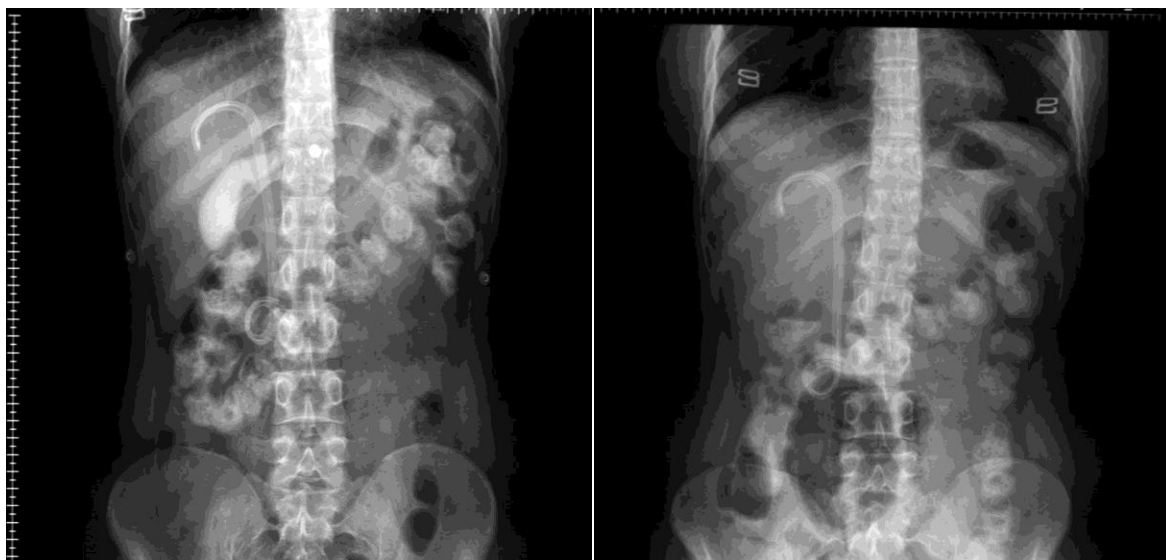


Figure 1 A

Figure 2 B

FIG. 2. Abdominal X ray showing contrast in the GB (2A) and clearance after amino acid infusion (2B).

#### 4. Discussion

Cholecystitis is a rare complication of ERCP with incidence rate of 0.5% to 5.2% and mortality rate of 0.04 [1]. Cholecystitis develops if gallbladder drainage is not performed due to the failure of cystic duct cannulation following the injection of contrast agents into the gallbladder. Bacterial translocation, contaminated contrast, and poor GB motility all exacerbate the possibility of post-ERCP cholecystitis [2]. A history of acute pancreatitis, history of chronic cholecystitis, gallbladder opacification, biliary metal stent placement, and high leukocyte counts before ERCP were established as potential risk factors for the occurrence of PEC [3]. Identifying the risk factors for PEC may help prevent this adverse event. The index patient had risk factors to develop cholecystitis like stones in the gallbladder, underwent endoscopic retrograde biliary drainage and had contrast opacification of the gallbladder. Various drugs were investigated for the treatment of biliary stasis including cholecystokinin and its analog, Sincalide, intravenous amino acid infusion, cholestyramine and dietary fat [4]. The work done by Nealon et al., demonstrates that intravenous amino acid infusion in humans causes a dose related emptying of the gallbladder [5]. High dose amino acid infusion associated with significant release of CCK from CCK-containing cells in the gut either directly or indirectly. CCK causes contraction and emptying of gallbladder.

#### 5. Conclusion

Identification of risk factors, prompt recognition and management will reduce the frequency and severity of post ERCP cholecystitis. Intravenous amino acid infusion facilitates GB contraction. It can be used to clear the contrast and prevent cholecystitis following ERCP.

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