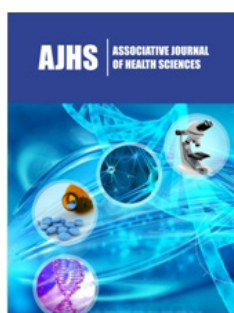


Hyperbilirubinemia 73mg/Dl After Acute Suppurative Cholangitis is Not Always Fatal, a Case Report

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Abstract

Background: Obstructive jaundice is a common health problem with various complications including liver dysfunction as well as systemic complications. Proper treatment of the underlying etiology should be the primary goal in management. However, different therapeutic approaches have been tried in lowering the bilirubin serum levels when treatment of the underlying cause is not feasible or unsatisfactory. These approaches include extracorporeal liver support (e.g., Molecular Adsorbent Recirculating System (MARS), plasma exchange, and charcoal. To the best of our knowledge, this is the first case of marked hyperbilirubinemia that was successfully managed with combined ERCP and plasma ultrafiltration.

Case presentation: We describe a case of marked hyperbilirubinemia (73mg\dl) following cholelithiasis and acute suppurative cholangitis that was successfully treated by combined plasma ultrafiltration and internal drainage through ERCP and biliary stenting.

Conclusion: The collaborative teamwork between gastroenterologist, endoscopist and nephrologist thorough the combined biliary drainage with ERCP and ultrafiltration could save the life of a patient with marked hyperbilirubinemia.

Keywords: Hyperbilirubinemia; Plasmapheresis; Cholangitis; Mortality

Abbreviations: ERCP: Endoscopic Retrograde Cholangiopancreatography; MARS: Molecular Adsorbant Recirculating System; CBD: Common Bile Duct, IHBC: Intrahepatic Biliary Channel; MRCP: Magnetic Resonance Cholangiopancreatography

Background

Obstructive jaundice is a common problem with different etiologies. It does occur due to interference with bile flow from the liver down to the duodenal papilla [1]. The hazards of obstructive jaundice include liver dysfunction as well as systemic complications. Disruption of the intestinal mucosal barrier as a consequence of the decrease of bile in the gut results in an increased absorption of endotoxins and inflammatory cytokines (TNF- α , IL-6) production. As a result, systemic inflammatory response syndrome occurs which may lead to multiple organ dysfunction syndrome. Fatal complications could occur such as hemodynamic instability and acute renal failure, cardiovascular suppression, immune compromise, coagulation disorders [2], so urgent and effective management is mandatory to avoid further organ damage, especially permanent liver damage [3].

Proper treatment of the underlying condition should be the primary goal in the management [4]. However, different therapeutic approaches have been tried in lowering the bilirubin serum levels when treatment of the underlying cause is not feasible or unsatisfactory. These approaches include extracorporeal liver support (e.g., Molecular Adsorbent Recirculating System (MARS) [5], plasma exchange, and charcoal hemoperfusion [1,6]. Plasma exchange is a safe and effective method for the clearance of bilirubin and has

been tried in many cases with acceptable success rates [7,8]. Acute suppurative cholangitis, conveys sepsis in the biliary system and is associated with a wide range of morbidity and mortality mainly in the elderly and high-risk populations. The disease clinically is characterized by fever (and chills), jaundice, pain, and even shock [9]. In most of the cases it follows obstructive jaundice of any etiology, although it is one of the documented adverse events of ERCP and seldom occurs without obstruction or interventions [10]. We describe a case of marked hyperbilirubinemia (73mg\dl) following cholelithiasis acute suppurative cholangitis successfully treated by combined plasma ultrafiltration and internal drainage through ERCP and biliary stenting.

Case Presentation

A 42-year-old heavy smoker male patient known to have liver cirrhosis for four years presented to our outpatient clinic at Kafrelsheikh University Hospital with one month right upper quadrant pain; colicky, radiate to the right shoulder, associated with fever and jaundice. The condition was associated with clay stool and dark urine. On examination, the patient was very toxic, with deep jaundice and splenomegaly but without ascites. Laboratory evaluation revealed: total bilirubin 55mg\dl, direct bilirubin: 39mg\dl, S. creatinine: 3mg\dl. Ultrasound examination revealed Intrahepatic Biliary Channel Dilatation (IHBC), dilated Common

Bile Duct (CBD): 16mm with multiple stones inside. ERCP was done with pus drainage and multiple stone extraction and plastic stent insertion; cholangitis was diagnosed. The patient was discharged on demand against medical advice, refused to stay at hospital and did not receive the prescribed antibiotics. Ten days later, the patient came back with severe right hypochondrial pain, deep jaundice, fever, and toxemia. Total bilirubin was 73mg\dl and direct bilirubin: 60mg\dl. Serum creatinine was 5mg\dl. Abdominal US revealed no IHBC dilatation. MRCP revealed distal CBD stricture and residual stones. Two sessions of plasmapheresis were done as a trial to reduce the markedly elevated bilirubin. As regard plasmapheresis was done by membrane plasmapheresis using a plasma flux filter P1 with about around 2400ml plasma volume exchanged during the session. The hemodialysis machine used for plasmapheresis was Fresenius 4008s hemodialysis machine. Two days after the second session, total bilirubin was: 37mg\dl, Direct bilirubin: 29mg\dl. Follow up abdominal ultrasound showed nonfunctioning stent, ERCP was done with removal of the old upward migrated occluded plastic stent (Figure 1) and insertion of a new plastic stent 10F\10cm. The patient was kept on antibiotics and follow up; and 3 days after the second ERCP, total bilirubin dropped to 15mg\dl and 10mg\dl direct bilirubin. Follow up the patient after 1 months revealed a functioning stent with total bilirubin 2mg\dl. Three months later the serum bilirubin was 1.2mg/dl.

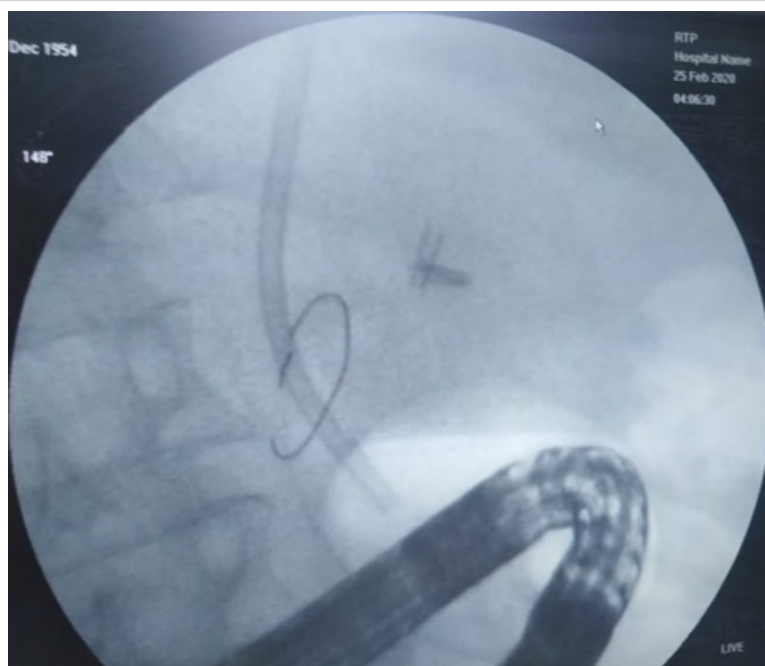


Figure 1: Upwards migrated stent noticed in ERCP.

Discussion

Our case developed progressive post ERCP cholestasis mostly due to inadequate antibiotic treatment of the underlying cholangitis due to premature discharge of the patient from the hospital without receiving the antibiotics. Renal impairment subsequently developed, and this markedly worsened the general

condition of the patient and threatened his life. The patient was managed with plasma ultrafiltration followed by drop of the total bilirubin. Unfortunately, obstruction of the stent occurred and ERCP was done with stone extraction, extraction of occluded upward migrated stent. Follow up serum bilirubin was done for 3 months till it came to normal. The presented case here had some interesting clinical aspects. First, the patient presented by one

month history of improperly treated cholangitis. We do not have enough data about this one-month history of illness, but we expect that the underlying chronic liver disease, that is quiet high in our community, directed physicians treating him to thought in hepatic decompensation. Consequently, we alarm all physicians treating patients with chronic liver disease to exclude other diagnoses to avoid further delays in proper management. Second, the patient admitted to our hospital with very high serum bilirubin (53mg\dl) due to suppurative cholangitis and this was obvious with the pus flowing from the CBD at time of sphincterotomy. In fact, we achieved internal drainage, but the patient insists on discharge and ignored antibiotic therapy. This point of extreme importance because suppurative cholangitis in patients with chronic liver disease would result in high morbidity and mortality and this had been reported in many publications and consequently clinicians treating patients with acute suppurative cholangitis should begin aggressive antibiotic therapy as early as possible.

Third, the exceptionally high level of bilirubin (73mg\dl) reported in this patient in the second admission. In fact, we searched the literature, and we did not find similarly high level. However, a case report by Khurram et al., reported marked elevation of direct bilirubin to the level of (17mg/dl) due to ceftriaxone use. Whereas Guimarães and Silva described a case of marked hyperbilirubinemia not responding to plasmapheresis due to sickle cell anemia with reported serum bilirubin level of 53mg/dl. Fourth, it seems also that this high bilirubin level affected the renal function with high creatinine level. Although broad spectrum antibiotic therapy was initiated, the general condition did not improve. At that time, we sought advice of our nephrology team. They performed two sessions of plasma ultrafiltration and consequently serum bilirubin dropped to 37mg\dl. It was reported in the literature that different methods of dialysis may benefit patients with hyperbilirubinemia. The majority of cases were presented with acute liver cell failure treated with MARS. In fact, plasmapheresis or ultrafiltration was tried in treatment of severe hyperbilirubinemia in the centers lacking the facility of artificial and bioartificial liver support. Tried plasma ultrafiltration to treat patients with high serum bilirubin awaiting liver transplantation and also it was tried in patients with cholestasis with variable rates of success. To the best of our knowledge, this is the first case of ultrafiltration in managing acute suppurative cholangitis with this exceptionally high level of serum bilirubin.

We believe that plasmapheresis is not the ideal treatment for this patient with jaundice due to cholangitis. However, jaundice was progressively increasing with impending renal failure. Also, sufficient biliary drainage was not achieved due to the presence of biliary stricture and stent migration. We were worrisome about a multi-organ failure cascade with renal shutdown, so we thought out of box to control the condition by reducing bilirubin load through plasmapheresis that could strive for the opportunity to cure and this was supported by evidence from literature. Plasmapheresis is a safe effective treatment that may improve the survival in cases with hyperbilirubinemia due to different disorders. Another study from china demonstrated that plasma exchange is an effective

method in lowering high levels of bilirubin with fewer side effects. Fifth, the collaborative teamwork. We assume that this patient would have been lost if not managed by the teamwork between gastroenterologist, endoscopist and nephrologist. Unfortunately, in communities lacking this collaborative health care system, patients like our patient would be lost. Our hospital support this team activity, and this reflected on the good outcome we obtained. This case reflect that marked hyperbilirubinemia is not always fatal with proper management. Sixth, the importance of follow up. Over a 3 months period this critically ill patient was recovered. However, we encourage not only our juniors but also our patients not to be depressed and insist on good outcome provided that proper team management is applied. Conclusion: The collaborative teamwork between gastroenterologist, endoscopist and nephrologist thorough the combined biliary drainage with ERCP and ultrafiltration could save the life of a patient with marked hyperbilirubinemia.

Declarations

- A. Ethics approval and consent to participate was done
- B. Consent for publication written informed consent was taken from the patient
- C. Availability of all data and material of the patient: Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.
- D. Competing interest: the authors declare that they have no competing interest.

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