

Pneumobilia after blunt trauma of abdominal wall caused by car crash with hepatic rupture

Araba kazasının neden olduğu karın duvarı künt travmasında gelişen karaciğer rüptürü sonrası pnömobilite

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Abstract

Pneumobilia is the presence of air in the biliary system. It mostly indicates a connection between the biliary system and the gastrointestinal tract, although it can also occur after trauma. The best diagnostic modality of pneumobilia is computed tomography (CT). We herein present a 32-year-old male patient with pneumobilia due to hepatic rupture caused by abdominal trauma after car crash. The instability of the patient and hepatic rupture were the reasons of surgical treatment. The surgeon should know that pneumobilia and portal venous gas are easily confused. While mortality risk of pneumobilia is lower than that of portal venous gas, in such conditions the patient should be operated, because chance of cure is quite high.

Keywords: Pneumobilia, Hepatic rupture, Abdominal trauma, Blunt trauma

Öz

Pnömobilite, biliyer sistemde hava varlığıdır. Çoğunlukla biliyer sistem ile gastrointestinal sistem arasındaki bağlantıyı gösterir, ancak travmadan sonra da ortaya çıkabilir. En iyi tanısal radyolojik tetkik, bilgisayarlı tomografidir (BT). Bu yazıda, trafik kazası dolayısıyla gelişen karın travmasının neden olduğu hepatic rüptüre bağlı pnömobilite ile prezente olan, 32 yaşında bir erkek hasta sunulmaktadır. Hastanın cerrahi endikasyonları, instabilitesi ve hepatic rüptürü. Cerrahlar pnömobilite ve portal venöz gazın kolayca karıştığını bilmelidirler. Pnömobilitenin mortalite riski portal venöz gazinkinden daha düşük olmakla birlikte, bu gibi durumlarda hasta kesinlikle ameliyat edilmelidir, çünkü iyileşme şansı oldukça yüksektir.

Anahtar kelimeler: Pnömobilite, Hepatic rüptür, Karın travması, Künt travma

Introduction

Pneumobilia is presence of gas in the biliary tree. There are several conditions associated with pneumobilia: 1) Dysfunction of the Oddi sphincter (OD), 2) Spontaneous biliary fistula, 3) Surgical biliary-enteric anastomosis [1] and rarely, 4) Abdominal trauma [2]. Pneumobilia caused by blunt trauma is exceedingly rare and does not need any specific treatment. We herein present a case of a 32-year-old male patient with pneumobilia due to liver rupture after abdominal blunt trauma.

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Case presentation

A 32-year-old male was admitted to the emergency department after a car accident. He was driving at 60 kilometers per hour and not wearing a seatbelt. Physical examination showed bruises on the extremities and epigastric area. The abdomen was diffusely tender. Laboratory values were as follows: WBC: 8.84×10^3 , HGB: 7.8 g/dL, elevated liver function tests (aspartate transaminase 943 iU/L, alanine transaminase 897 IU/L), blood pressure: 90/50 mm Hg, heart rate (HR): 130 beats/min, respiratory rate (RR): 23 breaths/min, and oxygen saturation (SpO₂): 91% while breathing room air. An abdominal X-ray showed fluid in the abdomen.

The initially performed brain computed tomography (CT) did not show any cerebral lesions and the clinical condition was marked by hypotension and confusion. Later an abdominal CT showed Grade 3 liver laceration that involved hepatic rupture (crosses) (Figure 1), hemoperitoneum and pneumobilia (arrows) (Figure 2). An exploratory laparotomy was performed; about 1.5 liters of blood was observed in the right and left quadrants and a rupture was seen between 5th and 6th segments of the liver. All abdominal viscera were otherwise normal. The liver rupture was coagulated, a hemostatic sponge was placed, and the rupture was sutured with 3-0 vicryl. The peritoneal cavity was irrigated with physiologic solution. The layers of the abdomen were closed after achieving hemostasis. Postoperative period was uneventful. Patient's written consent and ethical approval were obtained (Decision No: LMC CS008).



Figure 1: Hepatic rupture (crosses)



Figure 2: Pneumobilia (arrows)

Discussion

Air present in the intrahepatic biliary tract is called pneumobilia [3]. When there is no surgically formed entero-biliary anastomosis, most pneumobilia cases are related to gallstones. Other causes include emphysematous cholecystitis, pyogenic cholangitis, and abdominal trauma [4]. Pneumobilia is diagnosed with ultrasonography, plain radiography, or CT. In ultrasonographic examination, the liver is observed to have a "stripped appearance." Plain radiography showed sword-shaped lucency in the area where air is present. However, CT is the easiest way of detecting pneumobilia, which readily reveals gas within the liver [5]. It is important to differentiate pneumobilia from portal venous gas. In pneumobilia, air follows the centripetal flow of bile and locates around the hilum. In portal venous gas, air follows the centrifugal flow and can be found near the hilum and towards the periphery [6]. Portal venous gas is associated with a high mortality rate (75-90%) [7].

In our case, in the absence of gallstones, cholecystitis, cholangitis and Oddi sphincter dysfunction lead us to believe that it is due to liver rupture. Pneumobilia and hepatic rupture were diagnosed while a CT was performed to identify the source of fluid in abdomen. According to the World Society of Emergency Surgery (WSES) liver injury scale, all instable patients with Grade IV laceration should be operated immediately [8]. Asymptomatic pneumobilia patients with bilioenteric fistula need surgical treatment while those with pneumobilia caused by blunt trauma does not [9]. In this case the operation was performed because of the instability and the hepatic rupture.

Conclusion

After investigating the literature and many cases of pneumobilia, we found that blunt abdominal trauma was a rare cause of pneumobilia. In comparison to portal venous gas, pneumobilia due to blunt trauma has a lower mortality risk which makes it treatable with surgery.

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