What is your diagnosis?

A 24-year-old female with multiple trauma, a victim of car accident as a passenger, presented to the emergency ward with blunt abdominal trauma less than 2 hours after the event. She had mild abdominal tenderness in the epigastric and periumbilical areas and gross hematuria. Rectal examination was normal. Bedside FAST ultrasonography of the peritoneal cavity did not reveal free fluid. Pelvic X-ray showed bilateral pubic rami fracture. She was hemodynamically stable and underwent CT scan to evaluate the intra-abdominal organs (Fig. 1).

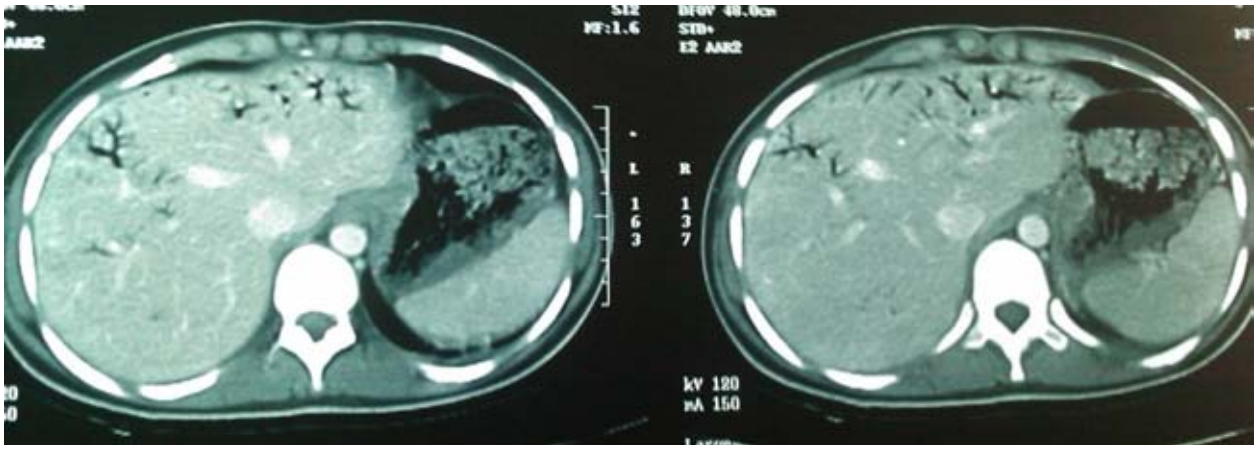

Fig. 1. Intravenous enhanced emergency CT scan of the upper abdomen.

What is your diagnosis?

Diagnosis: Hepatic Portal Venous Gas (HPVG) After Blunt Abdominal Trauma

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Standard abdominal sonography reported gas bubbles in the liver parenchyma, but no liver laceration or injury. CT scan showed gas bubbles in the portal radicals of the liver (Figs. 1 & 2) and extravasation of contrast media from the urinary bladder, no other soft tissue damage was detected. On IVP, extravasation from the bladder was confirmed. She was admitted to the ICU. The next day epigastric tenderness still persisted, she was stable and the WBC count did not rise. However, considering the presence of hepatic portal venous gas (HPVG), laparotomy was performed. Midline incision was made taking care not to enter the pelvic hematoma around the pubic rami fracture. A small amount (<100 ml) of thin serosanguinous fluid was found in the pelvic cavity without any evidence of hollow viscus injury (i.e. food particle, fecal contamination, pus, fibrin deposition). Hematoma was evident at extra peritoneal pelvic space. Urinary extravasation was confined to extraperitoneal space. Complete exploration of all intra- and extra-peritoneal organs including the digestive tube, the appendix, and the genitourinary tract was under taken. No other injury was found. No sign of injury such as ecchymosis, hematoma, contusion, ischemia, or necrosis was seen throughout the digestive tube. In the post-operative course, the patient did not experience any adverse event and was discharged after 2 weeks.

Fig. 2. Air is seen even in the central portal radicals.

Gas in the hepatic portal radicals is an ominous sign that generally indicates intestinal necrosis. The pathophysiology of gas bubble formation in the portal vein remains yet unclear despite various theories and experiments. Before the era of widespread availability of CT scan, HPVG was detected on plain abdominal X-ray which almost always demonstrates intestinal ischemia and necrosis findings, a dangerous situation that could be accompanied by 75% mortality.[1] Recent studies show that HPVG may also be seen in patients with inflammatory bowel disease, cholangitis and pancreatitis with no mortality. In some other conditions such as intra-abdominal abscess, gastric ulcer and intestinal distension HPVG leads to less mortality.[2] Thirteen cases of HPVG following blunt abdominal trauma have been reported.[3] In seven cases, intestinal necrosis was not found. This patient has the same condition. HPVG following blunt abdominal trauma may not necessarily indicate bowel necrosis. When found solely, not accompanied by any other findings of ischemic bowel injury, emergent laparotomy may be withheld unless another indication is present.

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