Laceration of Post-Hepatic Inferior Vena Cava and Right Renal Artery Caused by Blunt Thoracoabdominal Injury

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Abstract A man was admitted to hospital due to a blunt injury on the right side of thoracic back. The computed tomography scanning showed absence of free air or fluid in the abdominal cavity, bleeding in the right hepatic lobe (segments 7 and 8), filling defect in the junction between the right hepatic vein and inferior vena and in the posthepatic inferior vena, nonvisualization and medium dose of pleural effusion in right chest; there was complete occlusion and thrombogenesis in the right renal artery, nonvisualization in the right kidney. Repair of the right liver and posthepatic inferior vena, partial excision of middle lobe of right lung, excision of right kidney, and internal fixation of rib were performed. The patient underwent an uneventful recovery without occurrence of complications.

Keywords Laceration · Posthepatic inferior vena cava · Right renal artery

A 37-year-old coal miner was crushed by a stone weighing 200 kg from a 3 m-high roof while at work. At the accident scene, he complained of dyspnea, and right chest and upper abdominal pain, but no loss of consciousness. Because of no improvement in the disease condition, he was transferred to

our hospital for better treatment. Primary survey revealed stable hemodynamics, intact airway, respiratory rate 32 times/min, tenderness in the right lower thorax, sighs of friction feeling, flatness on percussion over the lower right lung field, no breath sound on auscultation. Meanwhile, his abdomen was flat without abdominal distention, but presented with peritonitis signs including tenderness on the right upper abdomen, rebound tenderness, muscular tension, etc. He had GCS score of 15, good sensorimotor ability in extremities, normal muscle force, and normal muscular tension.

Secondary survey revealed a 25×25 cm size of abrasion in the right lower region of chest and back; there was no blood clotting, which was confirmed by the right chest puncture through the sixth intercostal space in the axillary line. Rectal examination was without fresh blood. Given the patient's hemodynamic stability and mechanism of injury, he was taken for a computed tomography scan of the chest and abdomen. The computed tomography scanning with three-dimensional reconstruction demonstrated absence of free air or fluid in the abdominal cavity, bleeding in the right hepatic lobe (segments 7 and 8), filling defect in the junction between the right hepatic vein and inferior vena and in the posthepatic inferior vena, nonvisualization and medium dose of pleural effusion in the right chest (Fig. 1). There was complete occlusion and thrombogenesis in the right renal artery, nonvisualization in the right kidney; in addition, vascular reconstruction demonstrated nonvisualization with interruption in the junction between right renal artery and abdominal aorta (Fig. 2), suspected injury in right renal artery (grade V). Thereafter, the patient was taken emergently to the operation room for exploratory laparotomy.

In the operating room, after general anesthesia, the patient was lying in the left-lateral position, abdominothoracic incision was made in the thoracic and abdominal cavity for exploration.

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Fig. 1 Coronal CT scanning showed hemothorax, hepatic lacerating wound, and posthepatic inferior vena wound

Fig. 2 Abdominal vascular reconstruction image demonstrated non-visualization with interruption in the junction between the right kidney artery and abdominal aorta, and complete occlusion of kidney artery

He was found to have 1,500 ml of hemothorax, 1,000 ml of hemoperitoneum, comminuted fracture in the segments 8, 9, 10 of the right rib, no active bleeding, 60 % of lacerated wound in the middle lobe of right lung; and lacerated wound in the segments 7 and 8 of the right hepatic lobe; there was 1.5-cm longitudinal split tear in the posthepatic inferior vena cava and no active bleeding. Also, the right kidney was shown in kermesinus color, narrowing of right renal artery and no pulsation were observed.

Repair of the right liver and posthepatic inferior vena, partial excision of middle lobe of the right lung, excision of right kidney, and internal fixation of rib were performed. Then, he was sent to intensive care unit for monitoring care. No obstructions in the drainage tube, wound infection, bleeding, and bile leakage were observed. He underwent an eventful recovery and was discharged after 33 admission days. At 3-month follow-up, he restored ability of normal diet, independent life, and light physical activity.