Abdominal Wall Disruption

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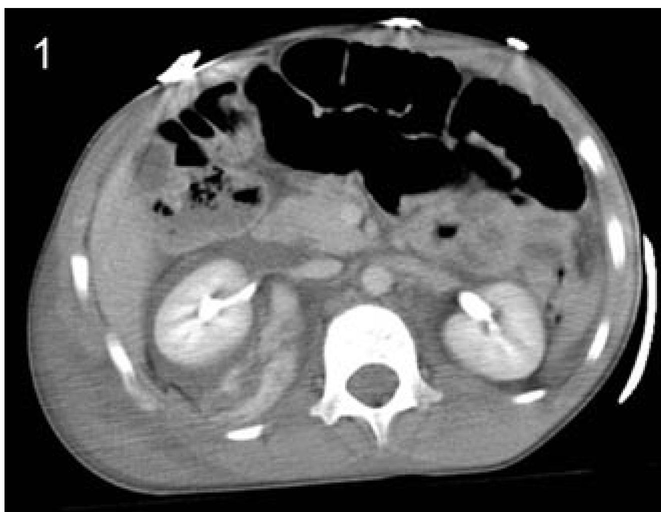
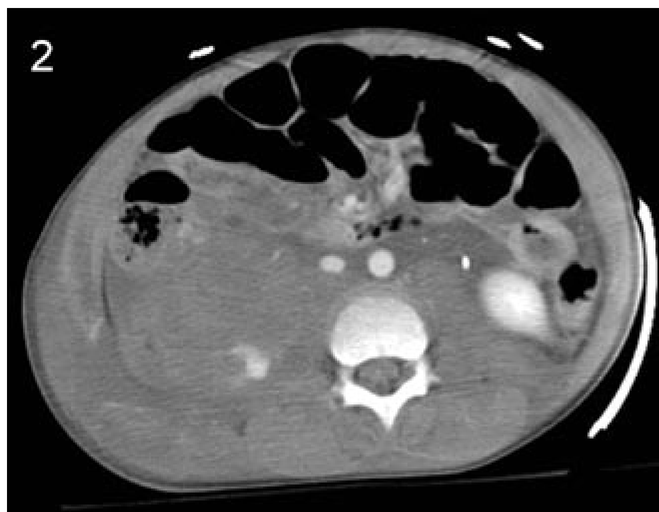
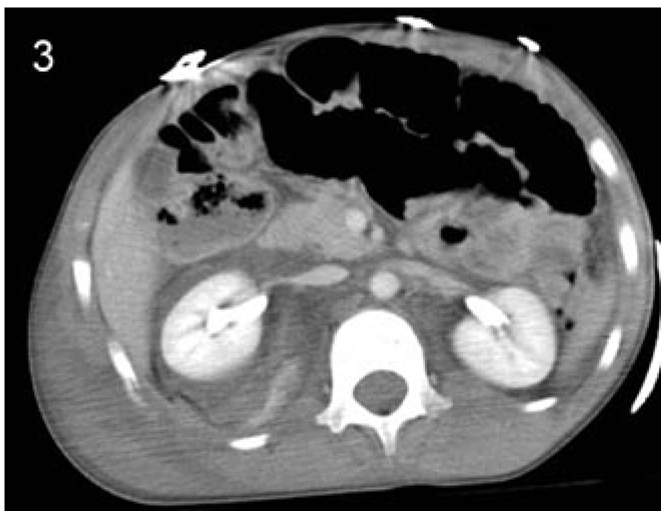
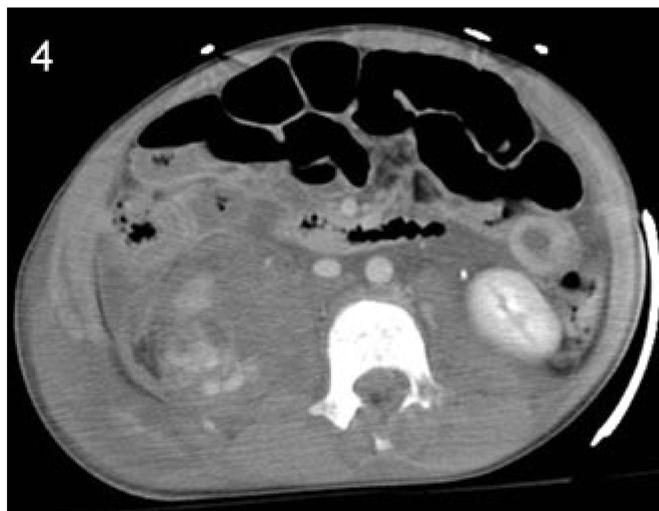
Six year-old comatose boy following ejection from a motor vehicle. He was transferred to our institution with quadriplegia, a right pneumothorax and an L2 Chance fracture. Cervical spine imaging at our institution revealed an undiagnosed atlanto-axial dissociation. Subsequent MRI confirmed this diagnosis and also showed atlanto-occipital ligamentous disruption. The images below were taken from the Abdomen/Pelvis CT. Images 1 and 2 are from the primary series, while images 3 and 4 are from the delayed series. Where does the contrast extravasation originate from?









Abdominal wall disruption is an infrequent result of blunt trauma to the torso, usually associated with bicycle handlebars or motor vehicle collision (MVC). In the case of MVC, the proposed mechanism is shearing of the abdominal wall by the safety belt after the pelvis slides forward and slips below it. Thus, the belt avulses the abdominal wall musculature from the iliac crest. Most commonly, injuries occur on the left side in belted drivers and on the right side in belted passengers. This difference is felt to be due to rotational forces at the time of injury. It is important to look for associated visceral injuries (especially bowel and mesentery), as they have been reported in up to 30% of cases, particularly when there is full thickness abdominal wall disruption. Herniation of abdominal fat or bowel through the defect can lead to strangulation if the defect is not repaired.

This case nicely demonstrates the large hematoma that can form within and around these muscles due to such an injury. The extravasated vascular contrast was surgically proven to arise from torn small vessels (un-named by the operating surgeon) within the abdominal wall muscles. Note the anterior displacement of the right kidney and ureter (the small dots of contrast seen on images 2 & 4, approximately 1.5 centimeters lateral to the inferior vena cava is the intact right ureter). The patient also had two small bowel injuries, which were repaired at the time of initial laparotomy. There was associated rupture of the right hemidiaphragm and fracture of the right 10th and 11th ribs, posterolaterally.

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