History
4 year old involved in an all-terrain vehicle accident.

Diagnosis
Liver Laceration with Active Extravasation

Discussion
Active extravasation can be associated with other injuries to arteries, such as a hematoma or a pseudoaneurysm. In contradistinction to active extravasation, an isolated pseudoaneurysm is contained by connective tissue or the vessel wall. Therefore, a pseudoaneurysm is likely to be adjacent to a vessel and does not enlarge or increase in attenuation as the contrast material washes out of the arterial system on delayed phase imaging if performed. The adventitia or connective tissue contains the contrast agent under pressure and forces the pool into a round or oval shape, which has a well-defined margins on CT images. With vascular active extravasation, the contrast-enhanced blood mixes with the fresh and clotted blood already present within the hematoma. The mixing of these viscous fluids creates high-attenuation shapes that initially appear like a jet or fountain, with a tapered edge, or like spiraling eddy currents, with ill-defined edges. Active extravasation can be differentiated from other high-attenuation entities, such as bone fragments, foreign bodies, and other forms of vessel injury if delayed phase imaging is performed. Both pseudoaneurysm and active extravasation change in appearance on delayed images, compared with their characteristics on arterial images. Bone fragments or dense foreign bodies have high attenuation, but their appearance, unlike that of vessel injury, does not change.

CT scan criteria for staging liver trauma based on the AAST liver injury scale include the following:
• Grade 1-Subcapsular hematoma less than 1 cm in maximal thickness, capsular avulsion, superficial parenchymal laceration less than 1 cm deep, and isolated periportal blood tracking
• Grade 2-Parenchymal laceration 1-3 cm deep and parenchymal/subcapsular hematomas 1-3 cm thick
• Grade 3-Parenchymal laceration more than 3 cm deep and parenchymal or subcapsular hematoma more than 3 cm in diameter
• Grade 4-Parenchymal/subcapsular hematoma more than 10 cm in diameter, lobar destruction, or devascularization
• Grade 5-Global destruction or devascularization of the liver
• Grade 6-Hepatic avulsion

Findings
CT-Extensive hepatic laceration with lobar devitalization and active arterial hemorrhage.
IR-Hepatic artery injection shows active extravasation with subsequent coil embolization.

Reference
Hamilton JD, Kumaravel M, Censullo ML, Cohen AM, et al. Multidetector CT Evaluation of Active Extravasation in Blunt

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