

RADIOLOGICAL FOLLOW-UP AFTER SPLENIC INJURY

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Non-operative management (NOM) with or without arterial embolisation has become the standard treatment for splenic injuries. In children, the complication rate after splenic trauma is rated from 0% - 8%, with a failure of NOM of almost 0% (Frumiento, Emery, Lynch, Hiraide, Minarik): Emery et al. studied 68 children and adolescents with splenic injuries grade 1- 3 (Brick and Mirvis classification, grade 3: parenchymal involvement > 50% or laceration > 3 cm) with ultrasound at 6 weeks intervals to document injury healing. They did not find any complications apart from two cysts, one of them decreasing. Lynch et al report no complications in 58 children with ultrasound follow-up until complete healing. Frumiento et al reported 3 spleen-related complications in 40 patients: Two pseudoaneurysms, both detected two weeks after injury with routine follow-up before discharge, thrombosed spontaneously and one abscess, found on CT seven days after injury was treated with drainage. In summary, in hemodynamically stable children, no routine follow-up is recommended, except, when a pseudoaneurysm (PSA) is found on initial imaging: In this case, a follow-up after two-three weeks may be feasible to document the thrombosis of the lesion.

In adults, the failure rate of NOM is reported from 3- 31%. The most common causes of failure are clinical evidence of ongoing bleeding, increasing volume of hemoperitoneum on CT and missed injuries. Bee et al. reported an increased risk for NOM in patients with age > 55 and for injuries grade 3-5. The study by Davis et al. found 22 patients with NOM failure, 7 because of PSA that could not be treated percutaneously, 7 because of clinical evidence of bleeding, 6 for worsening of CT findings, one for missed injury and one for splenic infarction. Interestingly in this paper, most of the PSA were found on follow-up CT (23 out of 31; 76%). It is unfortunately not mentioned why follow-up CT was undertaken. Failures of NOM increased with higher grade injuries in this study.

Lawson and Lyass studied the effect of follow-up CT on treatment: They conclude that there is no need for follow up in low-grade injuries or hemodynamically stable patients. Haan et al studied the clinical outcome of 110 patients with low-grade

injuries (1-2). All patients underwent repeated CT 48h after admission and there were no vascular delayed injuries detected. All patients were treated with observation. The authors conclude that there is no need for follow-up CT in low-grade splenic injuries.

In order to detect radiological signs that can lead to failure of NOM, at Ullevål University Hospital we recommend a follow-up examination 3-5 days after admission or at transfer to another hospital in grade 3-5 injuries and in all embolised patients. Signs of increasing hematoma or free fluid in the abdomen, a PSA or contrast extravasation should immediately lead to angiography. In a comparative study between contrast enhanced ultrasound (CEUS) and CT in follow-up after splenic trauma, CEUS had similar detection rates for grading of intraparenchymal lesions and infarctions as CT (31/32 and 17/18, Dormagen et al.).

Federle points out the clinical importance for the physician to get a confirmation of the healing process of the injury. Also at our institution, the surgeons are interested in at least one follow-up study of grade 3-5 injuries after discharge from the hospital, most often approximately 2 months after the trauma.

Apart from signs of bleeding or rebleeding that may lead to NOM failure, it is important for the radiologist to be familiar with other complications: Infarction after central or distal embolisation is common as is intraparenchymal air. Only in combination with clinical signs and an air-fluid level, intraparenchymal gas should be considered as abscess formation (Kileen et al, Haan et al.).

Literature:

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