

GGR SERVICE LINE

THE ESSENTIALS OF GI/GU/REPRODUCTIVE PROCEDURES

Brought to you by:

Procedural Education Committee of the GI/GU/Reproductive Service Line- Resident and Fellow Section, Society of Interventional Radiology

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ANGIOGRAPHY AND EMBOLIZATION FOR SPLENIC TRAUMA

INDICATIONS

Blunt splenic trauma with:

1. Active contrast extravasation on arterial phase CTA
2. Borderline hemodynamic status or transfusion requirement > 4U PRBC over 24 hr.
3. Grade III or higher splenic injury or vascular laceration
4. Splenic pseudoaneurysm or AV fistula
5. Delayed bleeding following conservative management or initial embolization
6. Patients with early ongoing bleeding after primary surgical hemostasis and crash laparotomy

CONTRAINDICATIONS

1. Hemodynamically unstable patient requiring emergent laparotomy

PREOPERATIVE PREPARATION

1. Often performed emergently; review of CT imaging (sensitivity 100% specificity 88% in predicting need for intervention)
2. Obtain necessary labs including: INR, platelets, creatinine and pregnancy test

CONSENT

Discuss treatment risks, benefits and alternatives

1. Anesthesia risks
2. Procedure risks:
 - a. Delayed hemorrhage requiring re-embolization/surgery
 - b. Infection
 - c. Splenic infarction with small risk of abscess
 - d. Post-embolization syndrome (fever, nausea, LUQ pain)
 - e. Non-target embolization
 - f. Access site complications: hematoma, pseudoaneurysm, vascular or nerve injury
3. Alternative treatments: Conservative management, Occasionally laparotomy

PROCEDURE

1. Conscious sedation or general anesthesia: depending on patient's condition and available resources
2. Femoral artery access is obtained using Seldinger technique and an 18 or 21 gauge needle, with or without ultrasound guidance.
3. Celiac artery is selected using a 4 or 5Fr curved catheter in combination with a Glidewire, and Celiac angiogram is performed.
4. The splenic artery is then selected with either the 5 Fr catheter or a coaxial microcatheter.

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5. Selectively catheterize the involved branch(es) of the splenic artery using a microcatheter with the goal of advancing the wire/catheter as distal as possible (distal to the origin of the dorsal pancreatic artery) but still proximal to the active extravasation source.
 - A. Coils are preferred for focal arterial injury with coils sized 20-25% larger than the vessel diameter, Gelfoam may be indicated if widespread injury
 6. Pseudoaneurysms may be treated by coiling in the parent artery at the injury site, deploying coils proximal and distal to pseudoaneurysm sac (“sandwich technique”). Distal embolization should be performed first.
 7. Post-embolization Celiac or splenic artery angiography should be performed to:
 - A. Ensure adequate resolution of previously identified extravasation or non-filling of pseudoaneurysm
 - B. Determine if there are other supplying branches that need to be embolized
 8. Withdraw the catheter and obtain hemostasis with closure device/manual compression.

POST-OPERATIVE CARE

1. Intensive monitoring
2. Re-imaging with CTA, Doppler ultrasound, or MRA

POSSIBLE EARLY COMPLICATIONS

1. Delayed hemorrhage/secondary splenic rupture (50% within a week, 75% within 2 weeks)
2. Infarction (minor infarctions more common with distal embolization)
3. Post-embolization syndrome
4. Left pleural effusion, lower lobe pneumonia/atelectasis

POSSIBLE LATE COMPLICATIONS

1. Secondary splenic rupture/rebleeding
2. Splenic abscess in small percentage of infarctions
3. Infection with 1-2% lifetime risk of sepsis if splenectomy performed
4. Hemorrhagic splenic pseudocyst, possibly requiring surgery/drainage

FOLLOW UP

1. Patients should be followed with serial CT examinations for one month;
A. ~75% of false aneurysms are detected on follow-up CT with uncertain incidence of delayed rupture 3-46%

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