

Provocative Mesenteric Angiography for Occult Lower Gastrointestinal Hemorrhage

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Background: For patients with occult lower GI hemorrhage and a negative arteriogram, provocative mesenteric angiography (PMA) is a technique that entails intra-arterially administered tissue plasminogen activator (TPA) and vasodilator as well as systemic heparin in order to provoke active extravasation, so that it can be embolized. The purpose of this study is to determine the safety and efficacy of PMA in a large cohort.

Methods: Retrospective review was performed on 119 provocative mesenteric angiograms on 109 patients (73 males, average 67.9 years, range 7-94) over a 20-year period. Medications were administered incrementally until active extravasation was visualized or until the operator deemed prudent to stop. Pertinent clinical, radiologic, and laboratory notes were reviewed. Complication rates within 30 days of the procedure were assessed.

Results: Out of 119 negative baseline mesenteric arteriograms, PMA induced active extravasation in 27.7% (n = 33) of procedures. The average TPA dose administered was 12.9 mg (range 1-50 mg). TPA was administered into a first-order visceral artery in 79 procedures, second-order in 22 procedures, third-order in 11 procedures, and multiple orders in seven procedures (p = 0.035). For patients with melena, 11.1% (5/40) were positive, whereas patients with hematochezia, 58.3% (28/48) were positive (p=0.003). For patients who had a prior CTA to assess for GI bleeding, PMA was positive in 50% with a prior positive CTA (11/22) and in 20.0% (7/35) in patients with a negative CTA (p = 0.021). In patients with a positive tagged red blood cell scan, PMA was positive in 43.2% (16/37) versus 13.6% (3/22) if negative (p = 0.021). While positive prior endoscopic results were not correlated with the PMA positivity rate, the mean number of prior endoscopies was significant (p = 0.012). While the admission hematocrit (HCT) and the lowest hematocrit after admission and prior to PMA were not statistically significant, the difference in these values was (p = 0.005). Total medication doses and blood transfusion amounts did not correlate significantly with positive studies. No major bleeding complications or intracranial hemorrhage encountered. Three minor self-limited groin hematomas encountered (2.5%).

Conclusions: Provocative mesenteric angiography demonstrated minimal bleeding risk in this cohort of patients, with a 27.3% positivity rate. Results of prior imaging and stool quality correlate significantly with successful provocation of bleeding.

Abbreviations

GI, gastrointestinal; IMA, inferior mesenteric artery; RBC, red blood cell; PMA, provocative mesenteric angiogram; SMA, superior mesenteric artery; TPA, tissue plasminogen activator