# Non-Superselective Embolization Using Quick-Soluble Gelatin Particles in Lower Gastrointestinal Bleeding Without Contrast Extravasation on Angiography

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## BACKGROUND

Lower gastrointestinal bleeding (LGIB) poses significant morbidity and mortality risks. Embolization has emerged as a crucial intervention for acute and life-threatening LGIB when endoscopic methods are unfeasible or ineffective. In cases where angiography fails to reveal contrast extravasation, concerns about bowel infarction may impede non-superselective embolization.

## METHODS

Patients
- 12 patients (6 male and 6 female)
- 17–90 years, mean 50.3 years
- Lower gastrointestinal bleeding(LGIB)
- Lacking contrast extravasation on angiography
- Underlying disease : Crohn's disease (n=5), Ileostomy(n=1), oozing bleeding post-endoscopic clipping(n=1)

LGIB Diagnosis & Locations
- CT(n=12), Endoscopy(n=7)
- Locations : jejunum(n=1), Ileum(n=2), ascending colon(n=4), rectum(n=5), and both ascending colon & rectum(n=1)
- CT findings
  mucosal enhancement (n=5)
  contrast extravasation (n=7)
  no bleeding (n=1, oozed bleeding after endoscopic clipping)

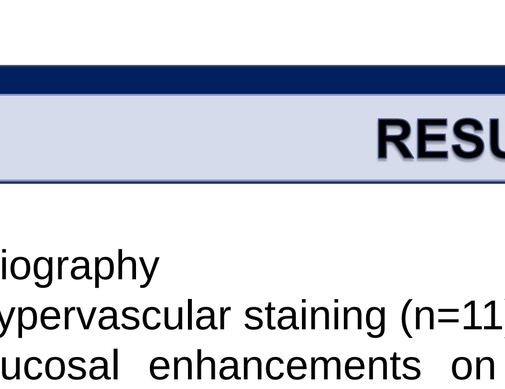
Superior & inferior mesenteric and internal iliac angiography
- no contrast extravasation

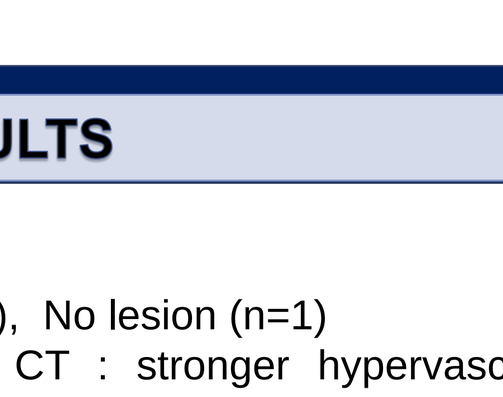
## RESULTS

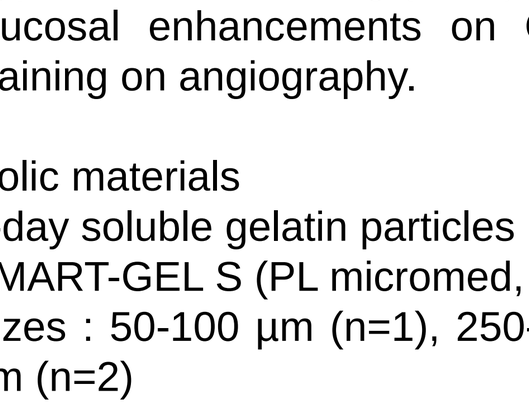
Angiography
- Hypervascular staining (n=11), No lesion (n=1)
- Mucosal enhancements on CT : stronger hypervascular staining on angiography.

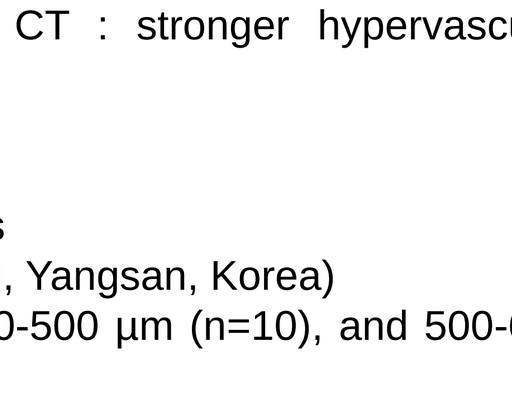
Embolic materials
- 2-day soluble gelatin particles
- SMART-GEL S (PL micromed, Yangsan, Korea)
- Sizes : 50-100 μm (n=1), 250-500 μm (n=10), and 500-600 μm (n=2)

**Rabbit renal artery embolization with 2-day soluble gelatin particles.** *Dign Interv Radiol. 2022;28(1): 65-71*





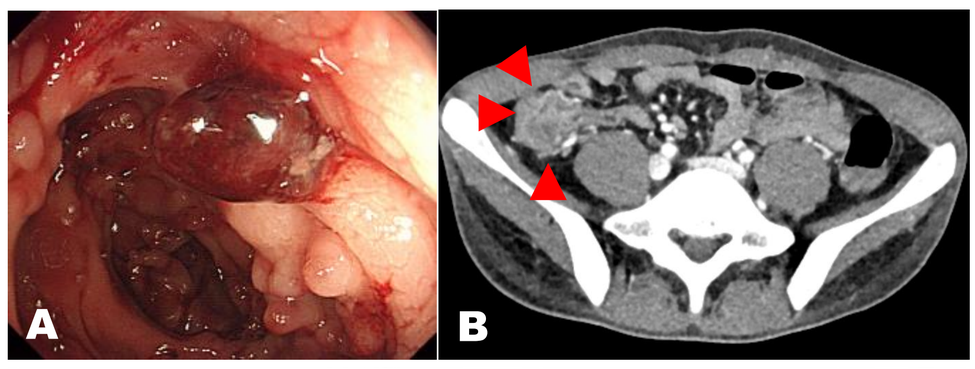





Embolization of arteries
- jejunal (n=1), Ileal (n=2), ileocolic (n=3), right colic (n=1), superior rectal (n=4), and superior rectal & ileocolic (n=1).

Bleeding cessation
- Immediate(n=12)
- Rebleeding (n=1) : controlled through follow-up endoscopy
- Bowel ischemia with perforation(n=1, **Case II**) : improved after surgery.

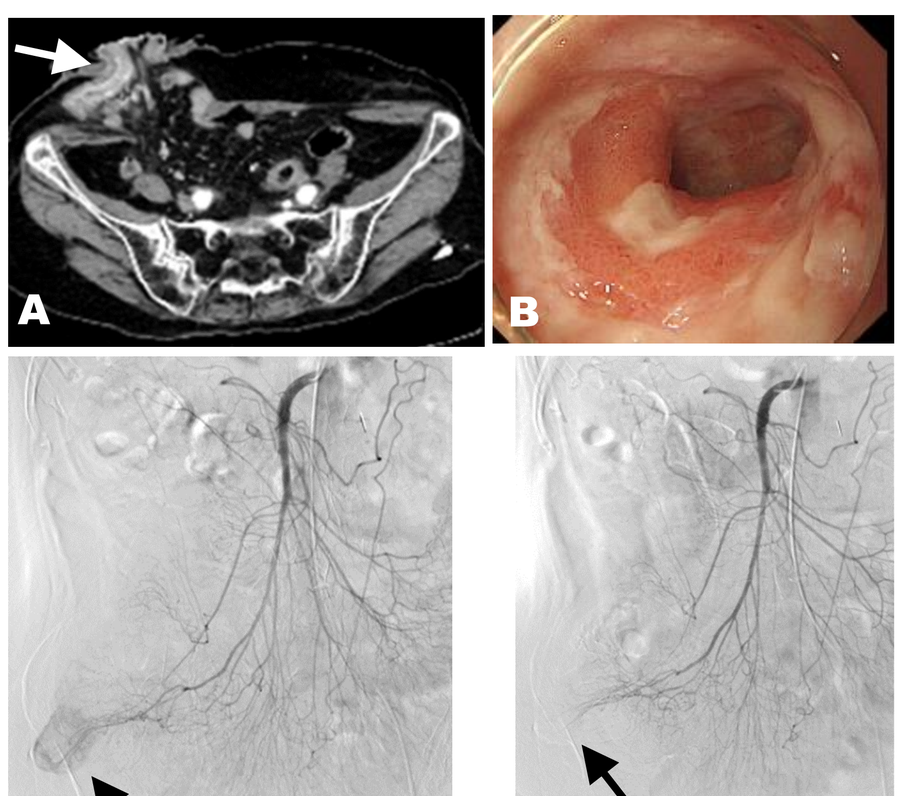
## RESULTS







**Case I** A 17-year-old male patient presenting with intermittent hematochezia and abdominal pain for two months. He was diagnosed with Crohn's disease and required a massive transfusion due to a low hemoglobin level (8.8 g/dL). **A.** Colonoscopic view reveals multiple ulcers with active bleeding in the ascending colon. **B.** Computed tomography displays bowel wall thickening and dilated blood vessels in the cecum and ileocecal valve (red arrowheads). **C.** Superior mesenteric arteriogram shows increased vascular staining in the cecum and the proximal ascending colon (arrow). **D.** Embolization of branches of the ileocolic artery (arrow) was performed using 2-day soluble gelatin particles (250-500 μm in size). Following the embolization and medical management, the patient's hematochezia resolved, and his hemoglobin level improved (11.2 g/dL).




**Case II** A 63-year-old woman experienced repeated episodes of rectal bleeding (200-250 cc). She had previously undergone ileostomy for rectal cancer. **A.** The CT scan reveals mucosal enhancement at the ileostomy site (white arrow). **B.** Endoscopy of this area reveals several white ulcers. **C, D.** The superior mesenteric arteriography indicates abnormal hypervascular staining in the ileostomy area, which was embolized using 2-day soluble gelatin particles (250-500 μm) (arrow). **E.** A bowel perforation occurred two weeks after the embolization (white arrowheads). **F.** A post-surgery CT scan shows the removal of the perforated section and the repaired ileostomy.

## CONCLUSION

Non-superselective embolization using quick-soluble gelatin particles proves to be a relatively effective and safe approach for LGIB patients without contrast extravasation on angiography.