Negative splenic angiography in blunt trauma: Does embolization affect splenic salvage?

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Introduction:

Angioembolization is used to attempt splenic preservation following injury. For patients with negative splenic angiography (SA), the relative merits of prophylactic embolization versus expectant management are unclear.

Hypothesis:

Embolization in negative SA is associated with splenic salvage.

Methods:

An IRB approved retrospective study from 2013 to 2022 was performed in a single level 1 trauma center.

Inclusion Criteria:

- Blunt splenic injury (BSI) on contrast enhanced computed tomography (CT)
- ≥18 years old
- Splenic angiography performed

Negative SA ≡ no active bleeding or pseudoaneurysm

"High-risk" features ≡ High grade BSI (IV-V) and CE on CT

Primary outcome ≡ splenectomy

p value of statistical significance: ≤0.05

Table 1. Factors associated with embolization

	No embolization (n=7)	Embolization (n=23)	p
Median age	38 (27-56)	34 (23-54)	0.76
Female sex	3 (43%)	6 (26%)	0.64
Median admission systolic blood pressure	113 (98-140)	136 (120-149)	0.11
Median Injury severity score	19 (17-34)	20 (9-26)	0.91
High grade BSI	0	10 (43%)	0.003
Contrast extravasation on CT	3 (43%)	14 (61%)	0.67

*Medians expressed with interquartile ranges

Table 2. Factors associated with the outcome (splenectomy)

	No splenectomy (n=25)	Splenectomy (n=5)	p
Median age	31 (24-50)	48 (38-78)	0.36
Female sex	8 (32%)	1 (20%)	0.99
Median admission systolic blood pressure	132 (114-142)	120 (98-144)	0.56
Median Injury severity score	19 (16-22)	34 (29-34)	0.09
High grade BSI	7 (28%)	3 (60%)	0.30
Contrast extravasation on CT	0	5 (29%)	0.052
Embolization	19 (76%)	4 (80%)	0.99

*Medians expressed with interquartile ranges

Results:

83 patients underwent SA for blunt splenic injury
30 (36%) had a negative SA

- 23 (77%) had embolization
  - 19/23 with SAE
- 5 (17%) had a splenectomy
  - 4/5 had a prior SAE to splenectomy
- 0 (0%) mortality

High grade BSI were more likely to undergo embolization (Table 1)
Grade of BSI, CE on CT, and SAE were not associated with splenectomy, but all splenectomies occurred in those with "high-risk" features. (Table 2)

20 had "high risk" features

- 17 (85%) had SAE → 4 (24%) had a splenectomy

10 had "low risk" features

- 6 (60%) had SAE→ 0 (0%) had a splenectomy

One patient developed pancreatic ischemia after embolization requiring distal pancreatectomy and splenectomy.

Conclusion:

Failure of nonoperative management (NOM) after prophylactic SAE remains significant in those with high grade injuries or CE on CT. Initial NOM is acceptable, but there should be a low threshold for early splenectomy.