



Effect on Intra-procedural Metrics of Pre-procedural CT Angiography prior to Conventional Angiography in Trauma Patients with Active Extravasation on Initial Portal Venous Phase Imaging

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INTRODUCTION: Repeat imaging with CT angiography (CTA) may be obtained in select trauma patients with active contrast extravasation on initial portal venous (PV) imaging to distinguish between arterial and venous etiologies. This study investigates the effect of pre-procedural CTA on intraprocedural angiography metrics.

METHODS: 286 Trauma patients presenting to a Level 1 trauma center between 1/2015 and 10/2021 with a radiology report containing active extravasation on PV abdominopelvic imaging were identified. 75 patients from this cohort subsequently underwent conventional angiography (CA). These patients were divided into those who underwent CTA evaluation prior to CA (CTA+CA, n=42) and those who underwent CA directly (CA only, n=33). Primary outcomes were intra-procedural contrast dose, fluoroscopy time, radiation dose, and sedation time. Secondary outcomes were conventional angiography (CA) findings and embolic therapy method, (i.e., targeted versus empiric).

RESULTS: There was no statistically significant differences in mean intra-procedural sedation time (minutes) (103.5 ± 44.7 vs 107.5 ± 70.2 ; $p=0.777$), contrast dose (mL) (121.3 ± 42.7 vs 112.8 ± 68.3 , $p=0.534$), fluoroscopy time (minutes) (15.8 ± 8.7 vs 18.6 ± 17.9 ; $p=0.412$), and radiation dose (mGy) (1058.2 ± 1125.7 vs 928.9 ± 1208.8 ; $p=0.637$). There was also no significant difference in the percentage of patients who received embolization for active extravasation, patients who received embolization for vessel irregularity, and patients who received empiric embolization in the setting of a normal CA (table 1).

CONCLUSION: While CTA may be a useful tool in identifying patients with true arterial extravasation and minimizing unnecessary arterial intervention in patients with venous bleeding, obtaining CTA imaging prior to CA does not reduce the use of contrast, radiation, and sedation intra-procedurally in our trauma population. The additional data from pre-procedural CTA also does not appear to decrease the rate of empiric embolization compared to those without pre-procedural CTA imaging. The data suggest judicious use of repeat imaging in trauma patients destined for conventional angiography.

Table 1: Angiographic outcomes and intervention

	Angio Only (n=33)	CTA + Angio (n=42)	P=Value
Extravasation with embolization	36.4%	47.6%	0.357
Vessel irregularity with embolization	21.2%	23.8%	>0.999
Vessel irregularity with no intervention	0.0%	2.4%	>0.999
Negative CA with empiric embolization	12.1%	9.5%	0.725
Negative CA with no intervention	30.3%	29.2%	>0.999