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Solid Organ Pseudoaneurysms in Patients with High-Grade Traumatic Injuries: A Case Series

Objectives: Blunt abdominal trauma affects 25% of all patients admitted with traumatic injuries. Although relatively rare (occurring in 2-10% of cases of solid organ injury), the development of solid organ (splenic, hepatic, or renal) pseudoaneurysms (PSA), particularly after initial imaging, can pose a significant threat to patients. If untreated, these PSAs may rupture and lead to life-threatening hemorrhage. Despite this risk, the use of follow-up imaging after initial CT for blunt abdominal trauma remains controversial and has not been widely embraced. This case series shares experiences at two hospitals, a level 1 and level 2 trauma center, with 47 cases of solid organ PSAs after traumatic injuries.

Methods: A database was created to include all adult patients admitted at each trauma center between 2012 and 2020 for solid organ injuries with an AAST grade of 3 or higher. A retrospective review of this database was performed to identify patients with PSAs, their demographic characteristics, and their outcomes.

Results: A total of 1,260 patients were identified with high-grade solid organ injuries. Forty-seven of these patients (3.73%) were identified with a PSA, 21 of which were identified in the spleen, 15 in the kidney, and 11 in the liver. One patient had PSAs in two separate organs. The median AAST grade of solid organ injury in patients with PSAs was 4. Thirty-three patients (70.21%) had contrast blush and/or extravasation on initial CT imaging. Thirty-six patients (76.59%) ultimately underwent IR embolization within a median of 0 days from the time of injury to embolization. Only 12 patients (25.53%) had an abdominal CT Angiography (CTA) prior to discharge, and 3 patients (6.38%) required readmission for observation and/or treatment of their PSA. No patient had a ruptured PSA. All-cause mortality in these patients was 14.89%.

Conclusion: Overall, the incidence of PSAs in this series is consistent with that seen in previously published literature. However, previous literature has excluded patients with penetrating trauma. Given this patient population's high percentage of penetrating trauma, this case series highlights a potential new focal area of research. Since this database was created, both participating hospitals have undergone guideline changes, and all patients with solid organ injuries with an AAST grade of 3 or higher are required to undergo CTA surveillance prior to discharge to screen for PSA. Further studies are needed to determine whether this change in screening guidelines affects the incidence of diagnosed PSAs and patient outcomes.

