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

Shivani Jain

*LSU Health Sciences Center- New Orleans*

Harrison Travis

*LSU Health Sciences Center- New Orleans, htrav1@lsuhsc.edu*

Meredyth Berard

*LSU Health Sciences Center- New Orleans, mbera4@lsuhsc.edu*

Alexis Scheurermann

*LSU Health Science Center- New Orleans*

Alison A. Smith

*LSU Health Sciences Center- New Orleans, asmi60@lsuhsc.edu*

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

Shivani Jain<sup>1</sup>; Harrison Travis<sup>1</sup>; Meredyth Berard<sup>1</sup>;  
Alexis Scheurermann, MD<sup>2</sup>; Alison A. Smith, MD, PhD<sup>2</sup>

Louisiana University Health Sciences Center (LSUHSC) School of Medicine<sup>1</sup>,  
LSUHSC Department of Surgery, Division of Trauma/Critical Care<sup>2</sup>



## Background

### Rationale:

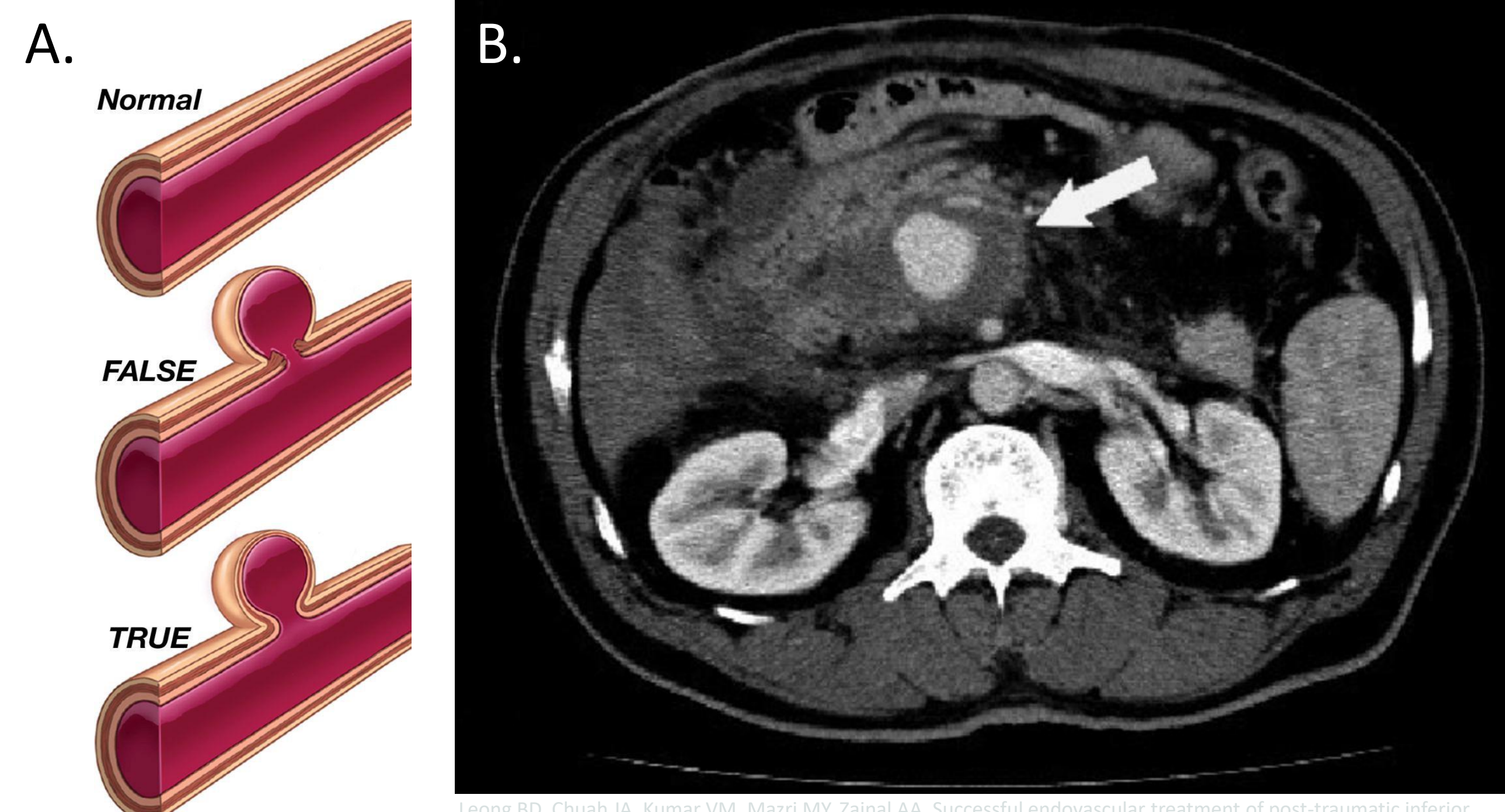
- Blunt abdominal trauma affects 25% of all patients admitted with traumatic injuries
- Although relatively rare (occurring in 2-10% of cases of solid organ injury), development of solid organ (splenic, hepatic, or renal) pseudoaneurysms (PSAs), particularly after initial imaging poses significant risk to patients. If untreated, these PSAs may rupture and lead to life-threatening hemorrhage
- Despite risk, use of follow-up imaging after initial CT for blunt abdominal trauma remains controversial and has not widely been embraced

### Objective:

- A case series was conducted to capture experience of missed solid abdominal organ PSAs at two hospitals, a level 1 and level 2 trauma center
- Overall goals were to explore clinically meaningful associations and to inform screening guideline development

**Figure 1. A.** Arterial cross-sections of a normal vessel, a false aneurysm (pseudoaneurysm) with disruption of the intimal and medial layers of the arterial wall, and a true aneurysm with all three arterial wall layers intact.

**B.** Axial CT image of the abdomen shows a pseudoaneurysm (arrow).



## Participant Data

**Table 1.** Patient Demographics, Injury Characteristics

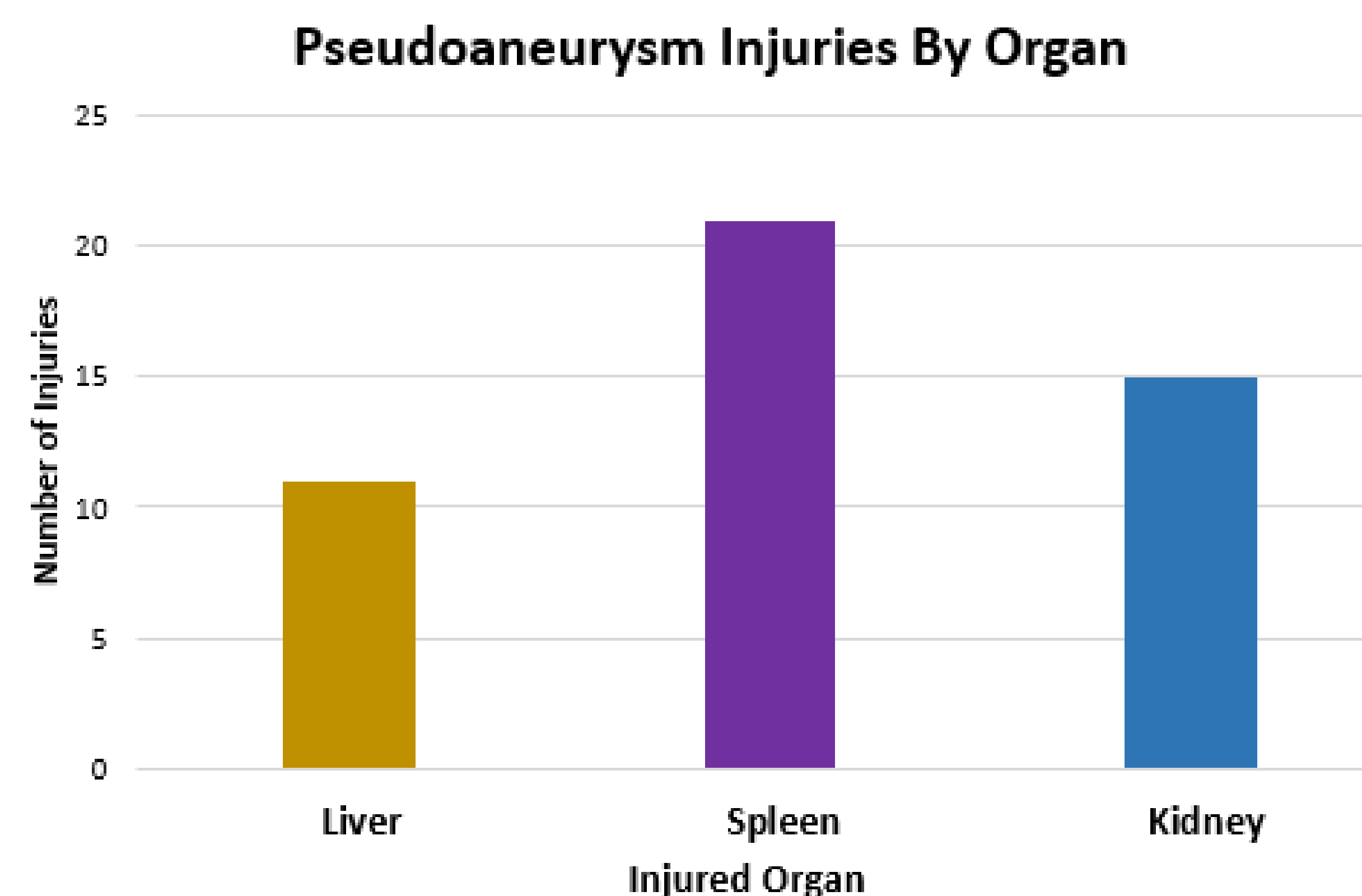
|                                |       |
|--------------------------------|-------|
| Age, (Median in Years)         | 34    |
| % Female                       | 68.3  |
| % Penetrating                  | 23.4  |
| ISS (Median)                   | 24.5  |
| AAST Grade (Median)            | 4     |
| Hospital LOS (Median, in Days) | 9     |
| % Readmitted for PSA           | 6.38  |
| % Mortality                    | 14.89 |

## Methods

- Created database from retrospective longitudinal data across 5 platforms to include all adult patients with traumatic solid organ injuries of an AAST grade 3 or higher between 2012 and 2020
- Performed quality control and comprehensive review to identify patients with PSAs, their demographic characteristics, and their clinical outcomes
- Statistical analyses were performed after controlling for outliers and performing 5-tiered checks of AAST grade level, Trauma Registry data input, and interpretation of raw imaging data as well as Surgery and IR medical notes

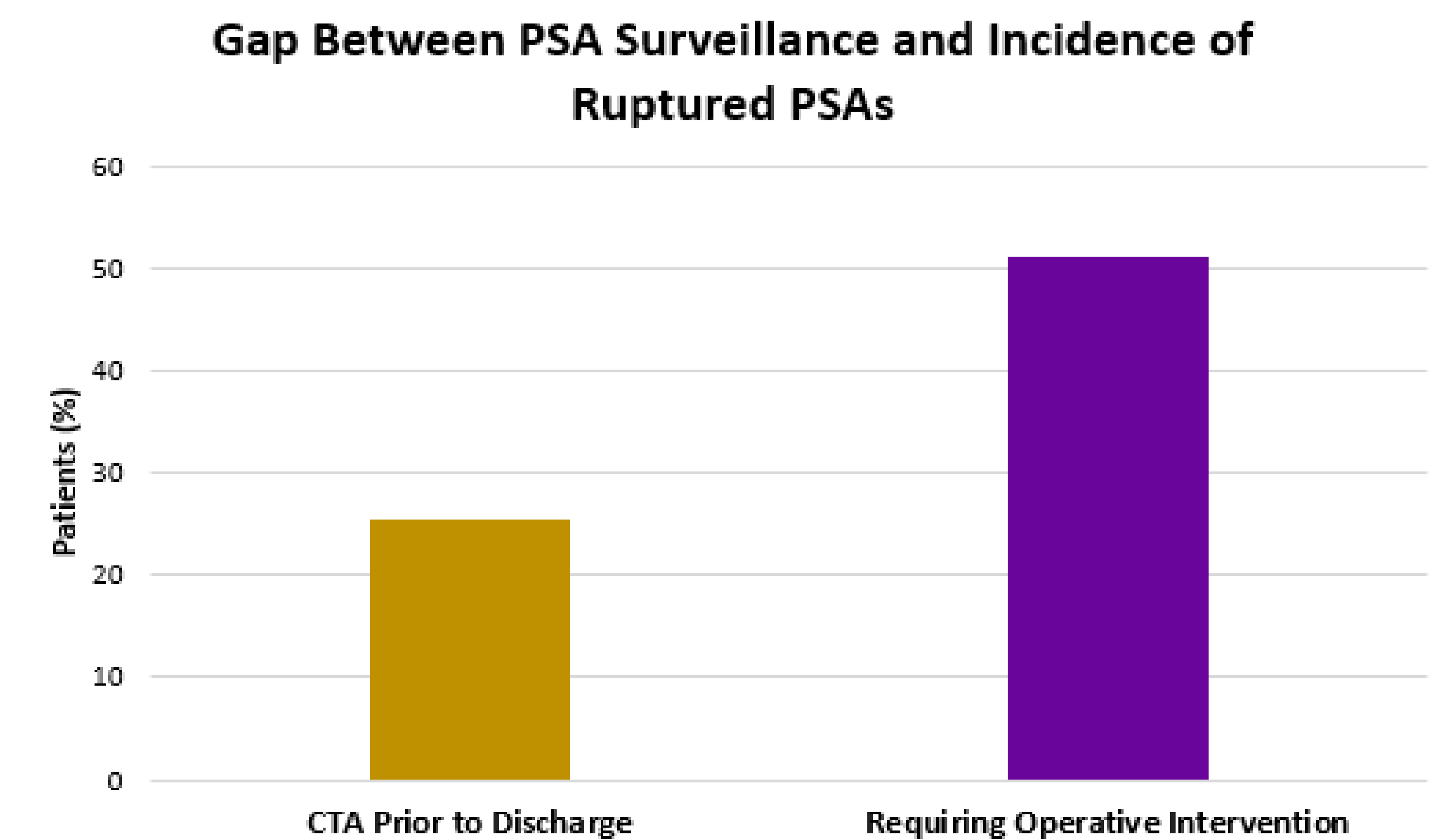
## Results: Figure 2

**Figure 2.** Number of hepatic, splenic, and renal PSAs accounted for across 2 major trauma centers from Jan 2012 – August 2022.



## Results: Figure 3

**Figure 3.** Percent of patients who had CTA prior to discharge and percent of patients who required intervention due to ruptured PSA



## Conclusions

- Incidence of PSAs consistent with that in previously published literature, but previous literature has excluded patients with penetrating trauma
- Given our population's ↑ percentage of penetrating trauma, this may be a focus for future research
- Now all patients with AAST grade 3 or higher solid organ injuries are undergoing CTA surveillance prior to discharge to screen for PSAs
- Further studies needed to determine whether this change in screening guidelines affects incidence of PSAs and patient outcomes

## References & Acknowledgments

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