

In Bad Shape: Does Contour of Hematoma in Pelvic Fracture Predict Arterial Extravasation?

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Background

- Pelvic fracture hemorrhage is associated with high mortality
- Treatments are multidisciplinary and algorithms vary between trauma centers

Objective:

- Assess correlation between pelvic hematoma convexity and source of hemorrhage

Hypothesis:

- Convex hematoma correlates with arterial hemorrhage

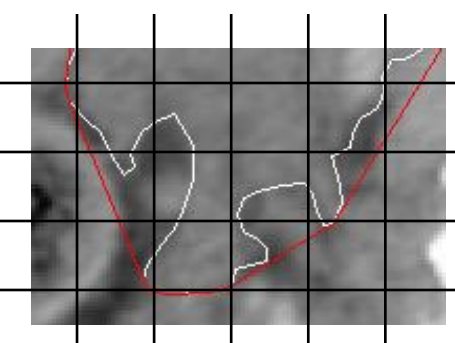
Methods

- Single center
- Retrospective
- Adult trauma patients
- Jan 2016 - July 2021
- Inclusion Criteria:
 - Pelvic fracture
 - CT scan obtained
 - IR angiogram after CT

- Analysis for convexity



Actual Hematoma Area
Convex Hull Area



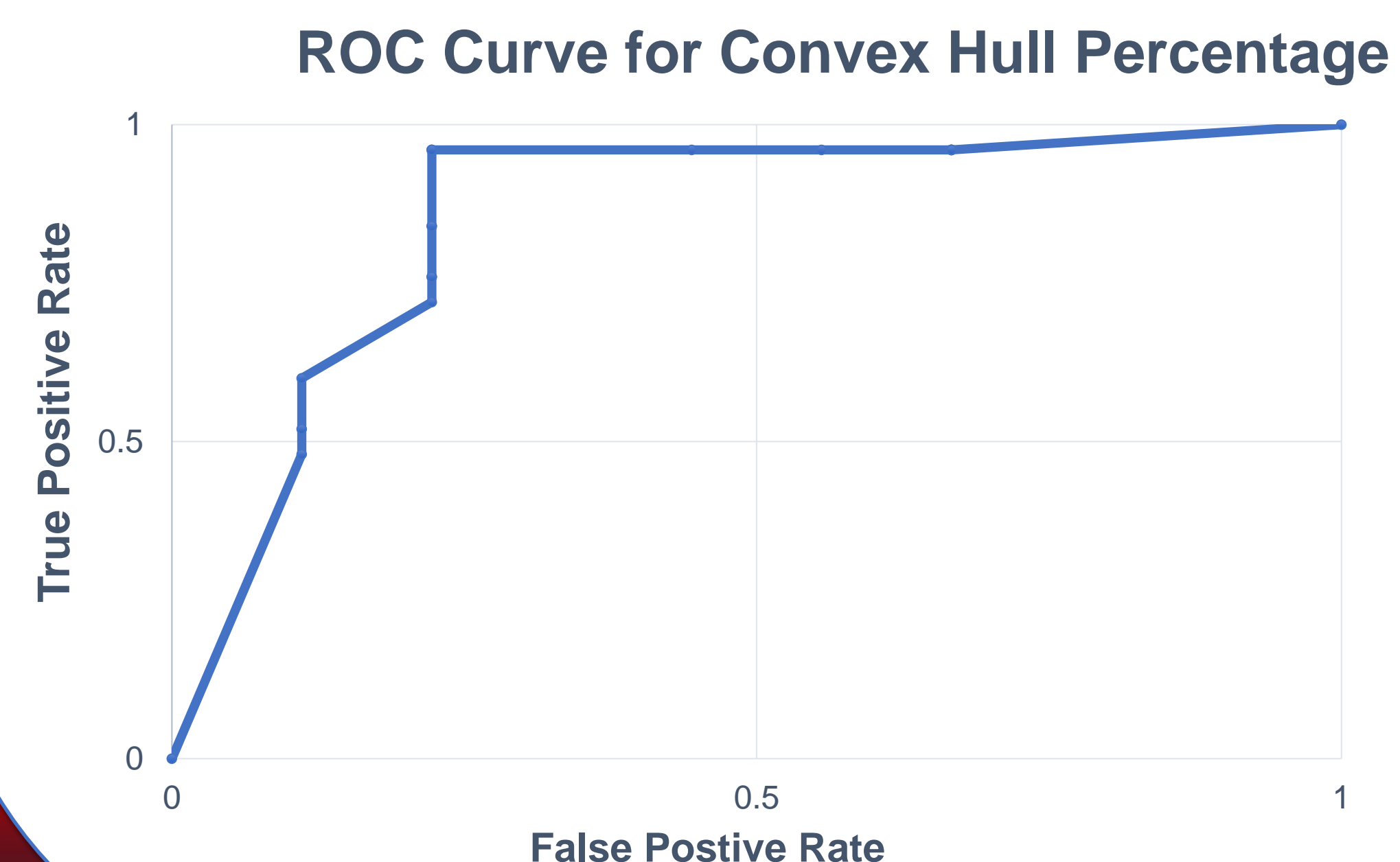
- Review by trauma surgeon and radiologist

Results

- Arterial hemorrhages in pelvic fractures are more likely to be convex when measured mathematically
- Convex hull percentage provides a strong predictive value to arterial hemorrhage
- Percent of crossings, qualitative evaluations of radiologist and trauma surgeon not significantly predictive

Category	Angiogram, Bleeding (n=19)	Angiogram, No Bleeding (n=12)	p-value
Percent convex hull (mean±SD)	82(±7.6)	71(±13)	0.007
Percent lines crossing more than 2 times (mean±SD)	35(±32)	56(±34)	0.09
Radiologist "round" n(%)	14 (74)	6 (50)	0.25
Trauma surgeon "round" n(%)	10 (53)	7 (58)	1

- The use of percentage of convex hull to predict arterial hemorrhage:

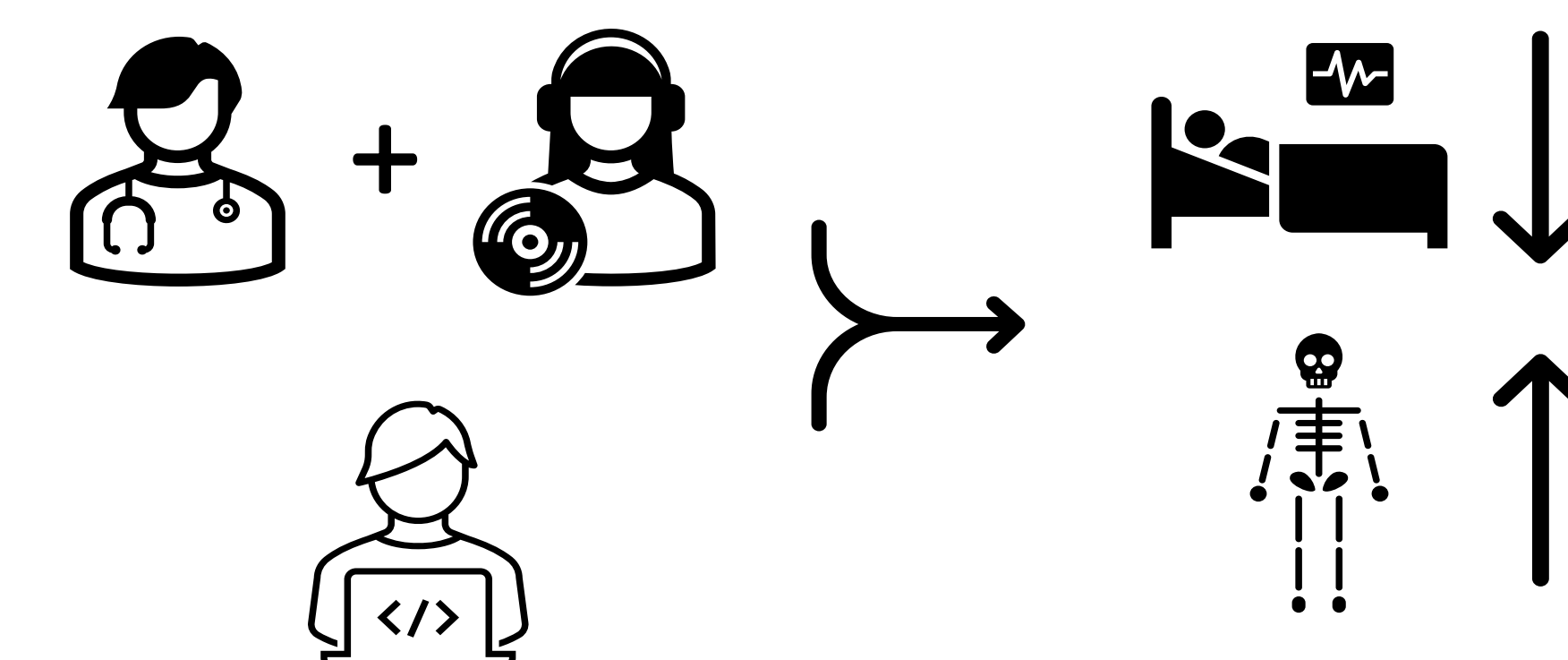


	Angiogram, Arterial Bleeding (n=19)	Angiogram, No Bleeding (n=12)
Above 72%	19	0
Below 72%	1	11

- Sensitivity: 95%
- Positive Predictive Value: 100%
- Specificity: 100%
- Negative Predictive Value: 92%

Conclusions

- Arterial hemorrhage in the pelvis appears to be convex based on geometry
- Convexity can be evaluated quantitatively using convex hull method
- Earlier identification of arterial hemorrhage may be used to optimize our treatment algorithms



Disclosures/References

- No disclosures
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