



HEMORRHAGE RISK AFTER ULTRASOUND-GUIDED
ABDOMINAL PARACENTESIS EXTREMELY LOW
WITHOUT THE USE OF PROPHYLACTIC BLOOD
PRODUCT TRANSFUSIONS



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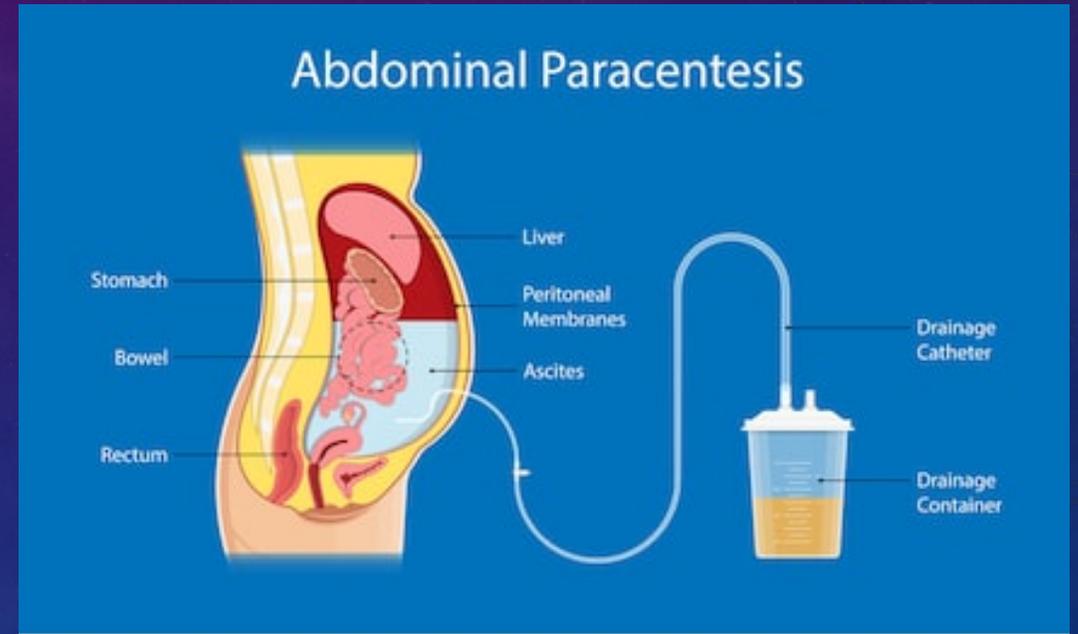
THE AUTHORS OF THIS STUDY HAVE NO
DISCLOSURES

TARGET AUDIENCE

- General Radiologists
- Interventional Radiologists
- Gastroenterologists/Hepatologists

ABDOMINAL PARACENTESIS

- Abdominal paracentesis (AP) is the most commonly performed procedure in patients with cirrhosis and is done for both diagnostic and therapeutic purposes.
- AP was the 30th most commonly performed inpatient procedure overall in the United States with 174,825 procedures in 2014 alone



ABDOMINAL PARACENTESIS CONT.

- The most common, major complication of AP is hemorrhage.
- No study has shown an association between low platelet count or increased International Normalized Ratio (INR) and bleeding risk.
- Many practitioners have concerns about the risk of major hemorrhage in settings of abnormal lab values
- A key factor contributing to the variation in clinical practice and concern is the discrepant state of widely utilized guidelines (i.e. American Association for the Study of Liver Disease (AASLD), Society of Interventional Radiology (SIR))



OBJECTIVE

- Determine the rate of hemorrhage after ultrasound-guided abdominal paracentesis (USAP) procedures performed by experienced radiologists without the use of prophylactic blood product transfusions.



METHODS

- Protocol approved by IRB at our institution
- Retrospective study
- Cohort included both inpatient and outpatient procedures performed over 2-year period
- All USAP performed by experienced radiologists
 - 5F multi-side-hole catheter or 16-gauge angiocath used
 - Patients ≥ 5 L of ascites removed routinely received 12.5 grams of albumin for every liter removed.
- Prophylactic transfusion policy for USAP similar to AASLD (i.e. no transfusion blood products given due to any abnormality with INR or platelet count)

METHODS

- Data Collected:
 - Age at time of procedure
 - Admission/discharge dates
 - Volume of ascites fluid removed (inpatients)
 - Hemoglobin, platelet count, International Normalized Ratio (INR), creatinine, bilirubin and ascites fluid studies
 - Need for dialysis
- Patients who received any blood products, who were admitted, re-admitted, presented to the ED, or underwent an angiogram were individually reviewed.
- FFP and Cost-Savings Analysis:
 - Patients with INR > 2.0 identified as those who would have received FFP by current guidelines.
 - The cost of FFP was estimated at \$400/unit and platelet at \$1000/transfusion

RESULTS

- Mean age 56.6 years
- 3116 USAPs performed over 2 years for both inpatient (n=757) and outpatient (n=2359)
- Baseline parameters and demographics shown to the right (and next slide)

<u>Inpatient and Outpatient Baseline Laboratory Parameters</u>				
	<u>All</u>	<u>No Bleeding Event</u>	<u>Bleeding Event</u>	
	n= 3116	n=3110	n=6	p-value
Hemoglobin (g/dL)	9.9 (2.0)	9.9 (2.0)	9.8 (1.5)	0.9068
Platelet Count (10³/μL)	121 (82)	121 (82)	138 (63)	0.6234
Platelet Count (10³/μL)				1
< 50	368 (12)	368 (12)	0 (0)	
≥ 50	2749 (88)	2743 (88)	6 (100)	
INR¹	1.6 (0.6)	1.6 (0.6)	2.0 (0.8)	0.1132
INR¹				0.1992
≤ 2	437 (14%)	435 (14%)	2 (33%)	
> 2	2679 (86%)	2675 (86%)	4 (67%)	
Creatine (mg/dL)	2.0 (2.4)	2.0 (2.4)	2.3 (1.7)	0.8155

RESULTS

- On univariate analysis, no risk factors were identified that predicted post- USAP bleeding

<u>Inpatient and Outpatient Baseline Laboratory Parameters</u>				
	<u>All</u>	<u>No Bleeding Event</u>	<u>Bleeding Event</u>	
	n= 3116	n=3110	n=6	p-value
Dialysis?				0.6239
Yes	707 (23%)	705 (23%)	2 (33%)	
No	2409 (77%)	2405 (77%)	4 (67%)	
Bilirubin (mg/dL)	3.5 (5.8)	3.5 (5.8)	7.8 (10.4)	0.0656
MELD²	18 (8)	18 (8)	24 (11)	0.0745
1. INR = International Normalized Ratio 2. MELD = Model End Stage Liver Disease Score				
***Data listed as mean+/-standard deviation or number with percentage				

RESULTS

- 6 of 3116 (0.19%) patients experienced post-USAP bleeding requiring pRBC (1 inpatient, 5 outpatient)
 - 1 patient required urgent angiogram and embolization of a bleeding abdominal wall vessel.
- No deaths due to USAP-related complications
- Baseline parameters for those 6 patients shown to the right

Characteristics of Patients with Bleeding Event									
	<u>Hgb</u> ¹ (g/dL)	<u>Platelets</u> (x10 ³ /μL)	<u>INR</u> ²	<u>Creatinine</u> (mg/dL)	<u>Dialysis</u>	<u>Bilirubin</u> (mg/dL)	<u>MELD</u> ³	<u>RBCs</u> ⁴	<u>Procedure</u>
1	7.7	187	3.6	3.04	Yes	27.9	40	1	No
2	9.4	82	2.2	1.7	No	10	29	1	No
3	11.8	234	1.4	1.7	No	4.4	21	5	Yes
4	10	104	1.7	5.28	Yes	1.8	28	1	No
5	8.9	76	1.9	0.84	No	1.6	15	2	No
6	11.1	143	1.3	1	No	1.1	10	2	No

Hgb = Hemoglobin INR = International Normalized Ratio MELD = Model End Stage Liver Disease Score
 PRBCs = Packed Red Blood Cells

RESULTS-COST ANALYSIS

- **FFP savings**

- 247 inpatients (33%) and 188 outpatients (8%) had INRs >2.0 and would have required FFP transfusion based on current guidelines
- Would require 1-5 units of FFP. Therefore, savings of **\$450,000** over a 2-year period.

- **Platelet savings**

- 131 (17%) inpatients and 235 (8%) outpatients with a platelet count under $50 \times 10^3 / \mu\text{L}$ would have required transfusion per guidelines.
- Would require single donor platelet transfusions. Therefore, savings of **\$366,000** over study period.

DISCUSSION & SUMMARY

- **USAP is a very safe procedure with extremely low rates of bleeding without the use of prophylactic blood product transfusions for correction of coagulation abnormalities.**
- **No variables were found to be predictive of hemorrhagic complications including MELD, INR, platelet count or degree of renal dysfunction.**
- **A no-prophylactic transfusion policy leads to avoidance of unnecessary risks to the patient and significant cost and resource savings.**

- Thank you for your attention!

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