



ENDOSCOPIC ULTRASOUND-GUIDED SHEAR WAVE ELASTOGRAPHY OF THE LIVER AND SPLEEN TO PREDICT COMPLICATIONS OF CIRRHOSIS AND CORRELATION WITH EUS-GUIDED PORTAL PRESSURE GRADIENT



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Introduction

Endo-hepatology (EH) is an emerging field which utilizes endoscopic ultrasound (EUS) to evaluate patients with chronic liver disease (CLD). This workup includes EUS-guided liver biopsies, EUS-guided portal pressure gradients (EUS-PPG), EUS-shear wave elastography of the liver (EUS-SWE-L) and spleen (EUS-SWE-S). Our study aimed to determine a correlation between EUS-SWE of the liver, spleen, and EUS-PPG and complications of CLD.

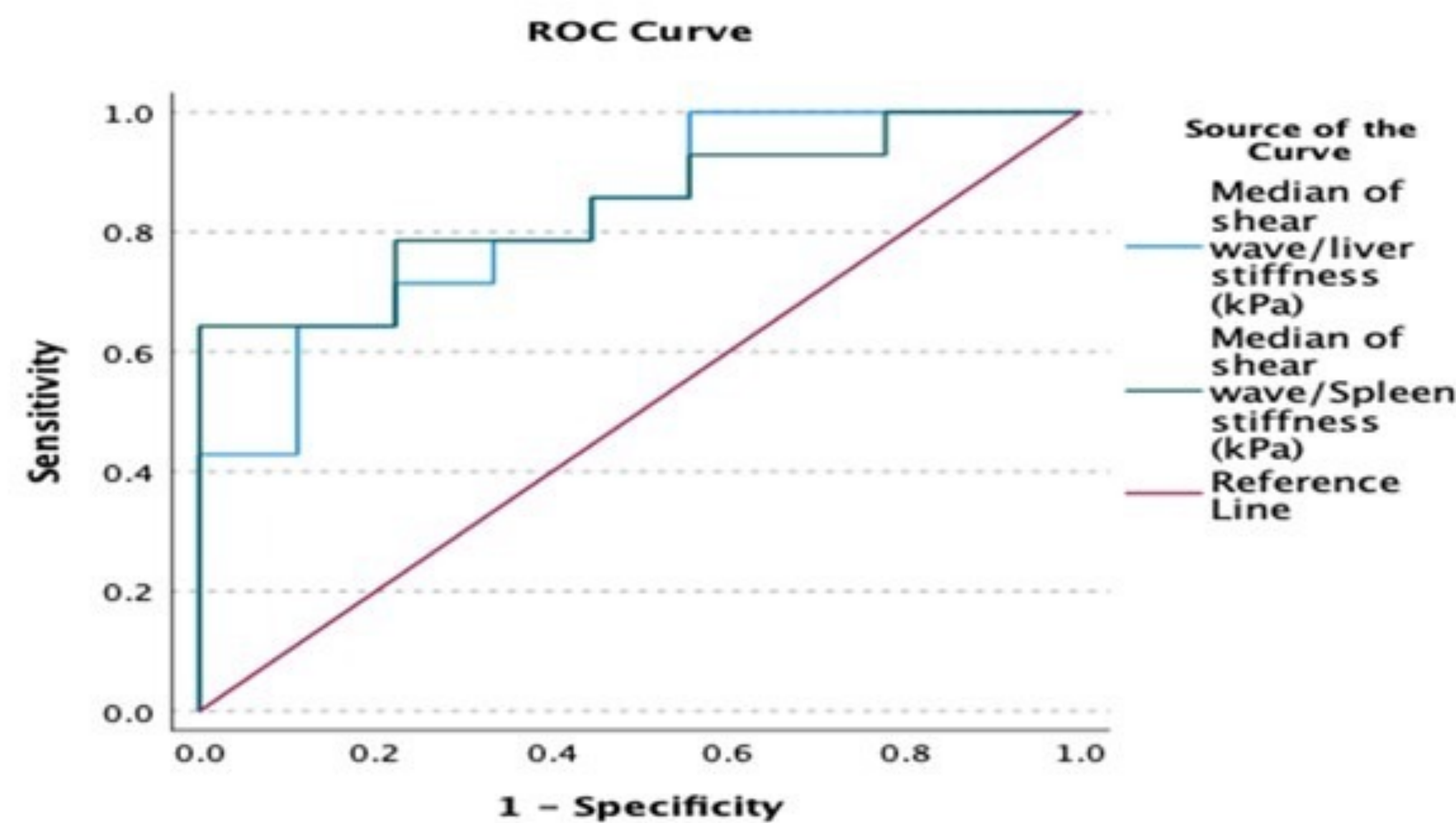
Methods & Data

- IRB approved retrospective analysis of 28 patients from 2021-22.
- Pearson correlation (PC) coefficients were used to compare EUS-SWE-L and EUS-SWE-S to EUS-PPG. T tests were used to compare EUS-SWE-L and EUS-SWE-S to complications of CLD such as ascites, presence of esophageal varices, and thrombocytopenia.
- Receiver Operating Characteristics Curve (ROCC) analysis was done to evaluate the utility of shear wave/liver stiffness and shear wave/spleen stiffness to predict the presence of esophageal varices or ascites.

Total number of patients, n	28
Age, mean in years (std. dev.)	50.25 (+/- 12.02)
Male, n (%)	16 (57%)
Race- white, n (%)	28 (100%)
BMI, mean (std. dev)	31.53 (+/- 9.85)
Liver biopsy performed, n (%)	22 (78.6%)
Stage ≥ F3 on biopsy, n (%)	16 (72.7%)
Esophageal varices, n (%)	9 (32.1%)
Ascites, n (%)	12 (42.9%)
Plt count <150, n (%)	16 (57.1%)
MELD-Na, mean (std. dev.)	12.67 (+/- 4.97)
Child score, mean (std. dev.)	6.81 (+/- 1.82)

Results

23 patients underwent EUS-SWE-S and 20 had EUS-PPG. Significant correlation noted between platelet count and EUS-SWE-L measurement (PC= -0.496, p=0.01). There was a significant difference in EUS-SWE-L measurement in patients with and without thrombocytopenia (28.90 kPa vs. 17.66 kPa, p=0.002) and in those with and without ascites (29.67 kPa vs. 18.64 kPa, p=0.003). There was also a significant difference in EUS-SWE-S measurements in patients with and without ascites (39.44 kPa vs. 30.06 kPa, p= 0.029). There was a weak correlation between EUS-PPG and EUS-SWE-S (PC = -0.45, p=0.05). ROCC analysis determined the best cut-off for EUS-SWE-L to predict the presence of esophageal varices or ascites was > 22.7 kPa with sensitivity of 78.6% and specificity of 55.6%. Best cut-off for EUS-SWE-S to predict the presence of esophageal varices or ascites was > 31.12 kPa with sensitivity of 85.7% and specificity of 55.6%.



Test Result Variable(s)	Area	Std. Error ^a	Asymptotic Sig. ^b
Median of shear wave/liver stiffness (kPa)	.825	.087	.010
Median of shear wave/Spleen stiffness (kPa)	.841	.082	.007

a. Under the nonparametric assumption
 b. Null hypothesis: true area = 0.5

Discussion

EUS-SWE of Liver and Spleen showed utility via statistical significance in predicting complications of liver disease such as varices, ascites and thrombocytopenia. There was also a weak, but statistically insignificant correlation between EUS-SWE-S and EUS-PPG. The limitations of our study include small sample size and, therefore, decreased power of the study. Further evaluation with a larger sample size is needed to better elucidate the findings determined in our study regarding EUS-PPG, EUS-SWE-S, and EUS-SWE-L. Our data suggests that these techniques have significant potential in determining those at greatest risk of complications of clinically significant CLD.

Variable	Variable present	Variable absent	p value
Ascites, mean kPa (std. dev.)	29.62 (+/- 9.89)	18.64 (+/- 6.95)	0.003
Plt <150, mean kPa (std. dev.)	28.89 (+/- 8.83)	17.66 (+/- 7.71)	0.002
Esophageal varices, mean kPa (std. dev.)	29.93 (+/- 8.60)	21.42 (+/- 9.63)	0.051

Variable	Variable present	Variable absent	p value
Ascites, mean kPa (std. dev.)	39.44 (+/- 8.80)	30.06 (+/- 10.42)	0.029
Plt <150, mean kPa (std. dev.)	35.27 (+/- 13.27)	34.55 (+/- 6.04)	0.874
Esophageal varices, mean kPa (std. dev.)	38.73 (+/- 10.37)	33.31 (+/- 10.50)	0.266