



RUTGERS
BIOMEDICAL AND
HEALTH SCIENCES



Endohepatology and Endosuturing for Obesity/NAFLD

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Disclosures

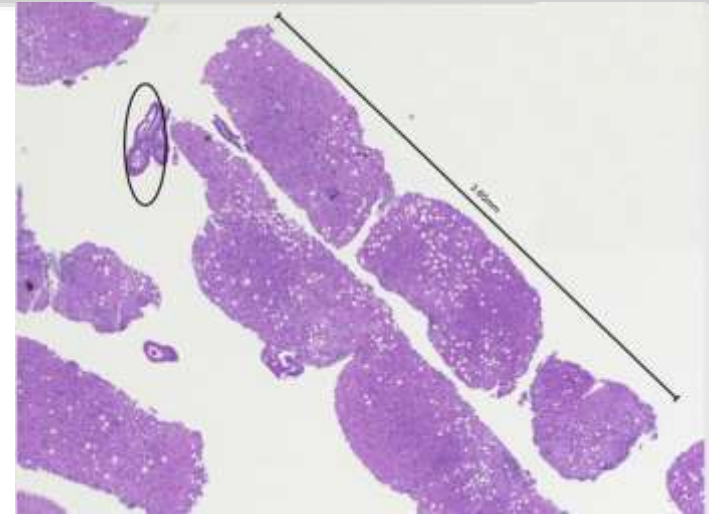
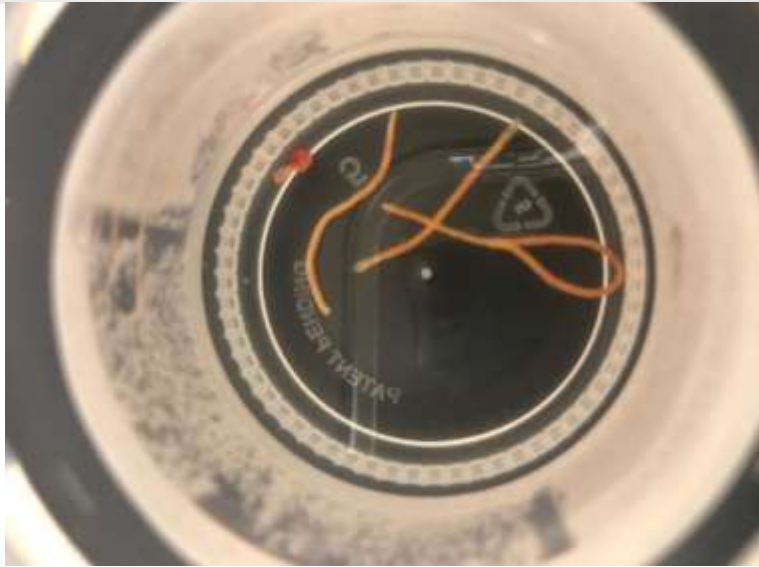
- Boston Scientific hands-on course alumni

Outline

- Endohepatology
 - Liver biopsy
 - Portosystemic gradient measurement
 - Elastography
 - Embolization
- Endoscopic suturing for weight loss in NAFLD

EUS-Guided Liver Biopsy vs IR Liver Biopsy

- Target both lobes
- Decreased patient pain and anxiety under anesthesia
- Decreased complication rates
- Decreased PACU stay
- Can combine with other endoscopic procedures
 - Variceal screening/banding/embolization
 - Portosystemic gradient measurement
 - ERCP
 - Etc.



Association of different techniques (EUS vs IR) of liver biopsy with continuous variables.

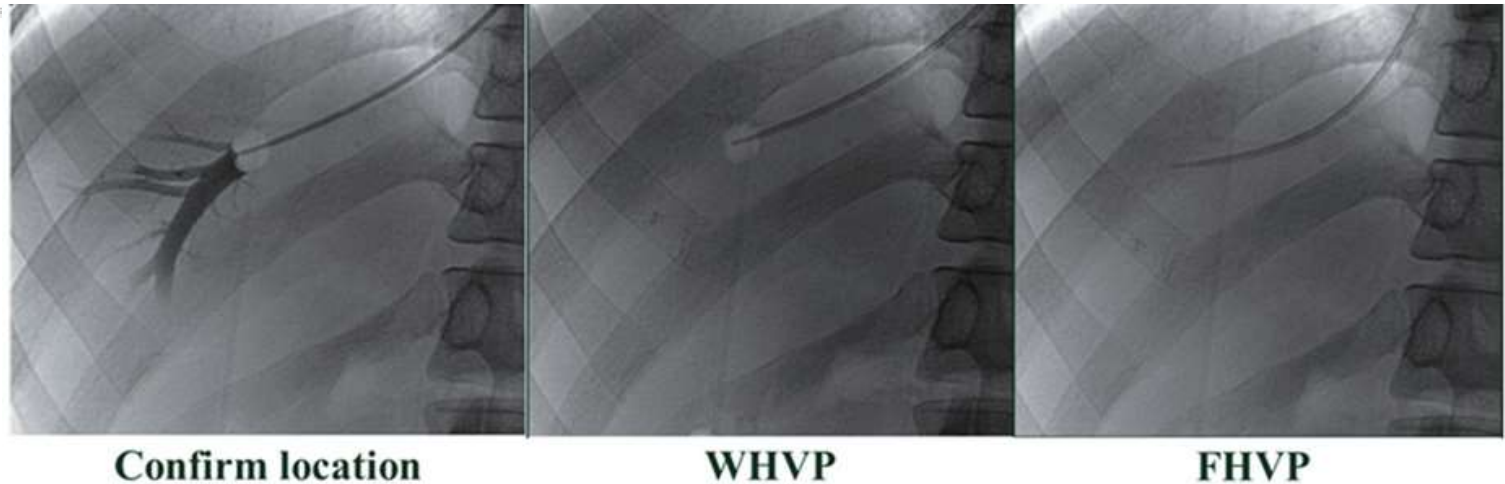
Variable	Group	N	Mean	Std. dev.	P-value
Complete portal triads (CPT)	EUS	69	10.84	7.23	0.0057
	IR	83	13.61	6.8	
Length of longest core	EUS	69	1.16	0.55	0.0752
	IR	83	1.31	0.48	
Total specimen length (TSL)	EUS	69	4.58	2.07	0.0016
	IR	83	3.59	1.44	

IR = PC and TJ.

IR complication rate 7% (6/83)

EUS complication rate 0% (0/69)

Portal Pressure Estimation



$$\text{HVPG} = \text{WHVP} - \text{FHVP}$$

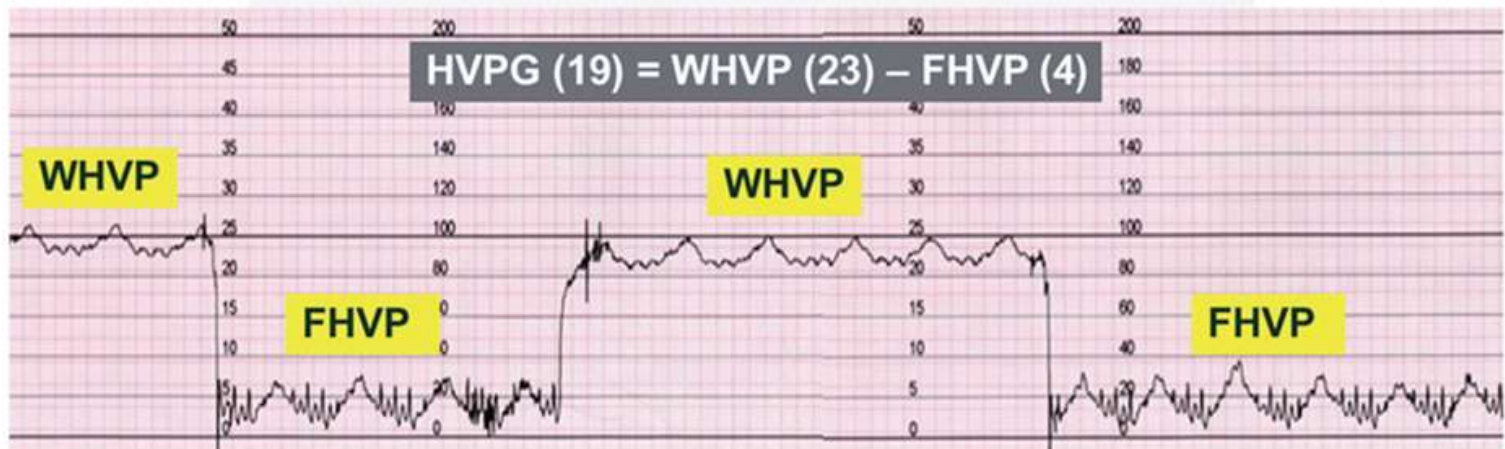


Figure 2. Method for HVPG measurement. HVPG, hepatic venous pressure gradient; WHVP, wedged hepatic venous pressure; FHVP, free hepatic venous pressure.

HVPG < 10 mmHg in **alcohol-related** or **viral cirrhosis** had no decompensation (variceal hemorrhage, ascites, HE) during 20-month follow-up

Gastroenterology 2007 Aug;133(2): 481-488

HVPG <10mmHg in **NASH cirrhosis** had 14% of patients decompensate during 20-month follow-up.

Hepatology 2019 Dec;70(6): 1913-1927.

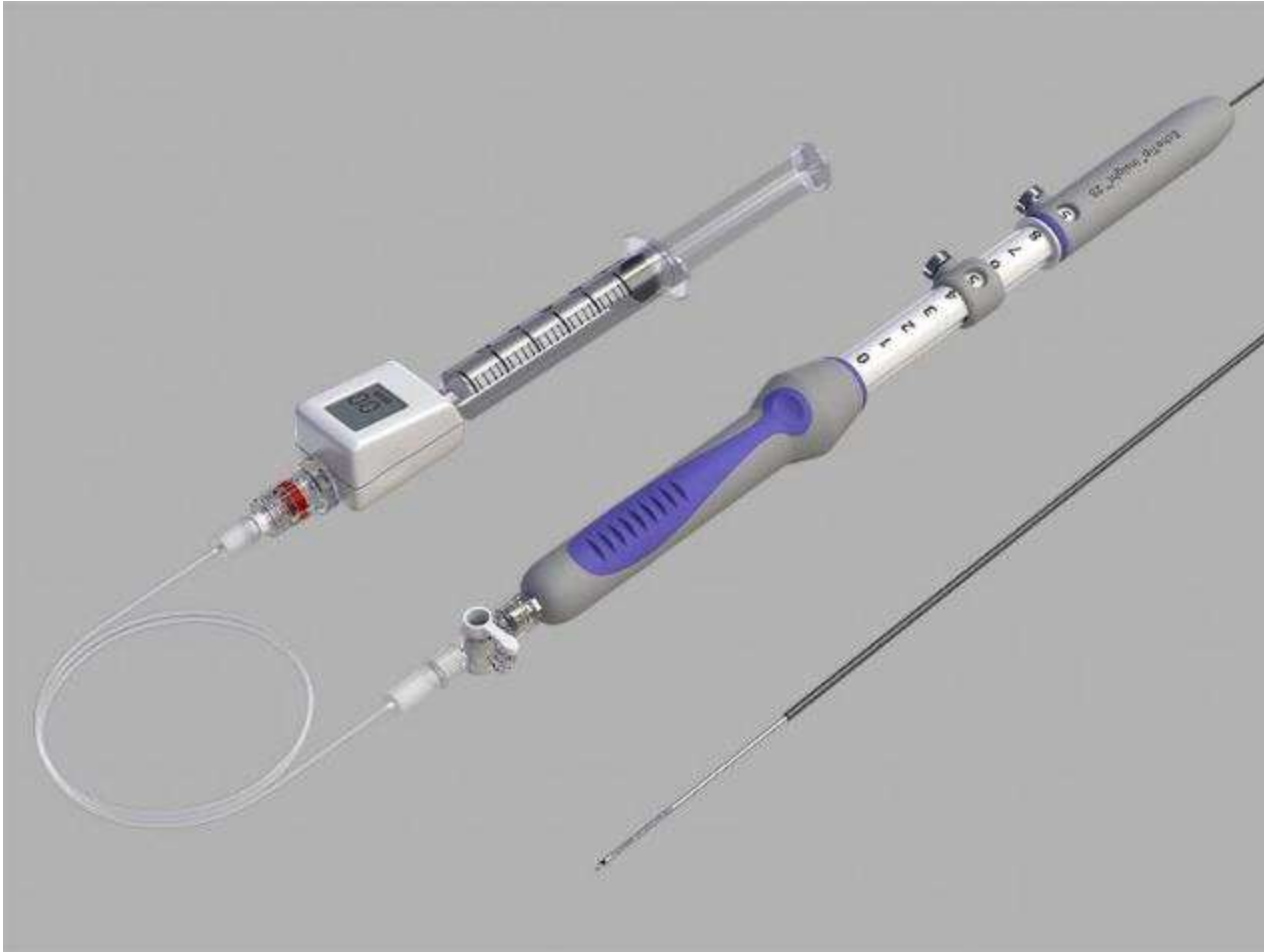
Table 2. Correlation between WHVP and PP.

	R	95% CI	p value	ICC	95% CI	p value
NASH group (n = 40)	0.61	(0.37–0.77)	<0.001	0.74	(0.50–0.86)	<0.001
Control group (n = 80)	0.92	(0.88–0.95)	<0.001	0.96	(0.94–0.97)	<0.001
Alcohol-related cirrhosis (n = 40)	0.93	(0.88–0.97)	<0.001	0.97	(0.94–0.98)	<0.001
HCV-related cirrhosis (n = 40)	0.91	(0.84–0.95)	<0.001	0.95	(0.91–0.98)	<0.001

Correlation between WHVP and PP was assessed by Pearson's correlation (R) and the intra-class correlation coefficient (ICC). NASH, non-alcoholic steatohepatitis.

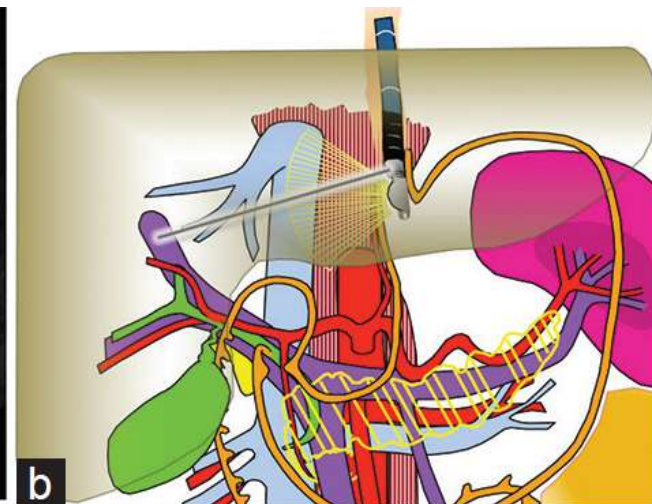
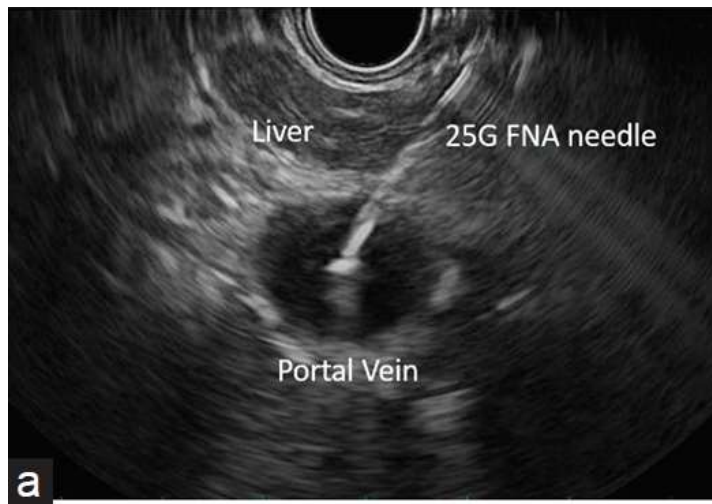
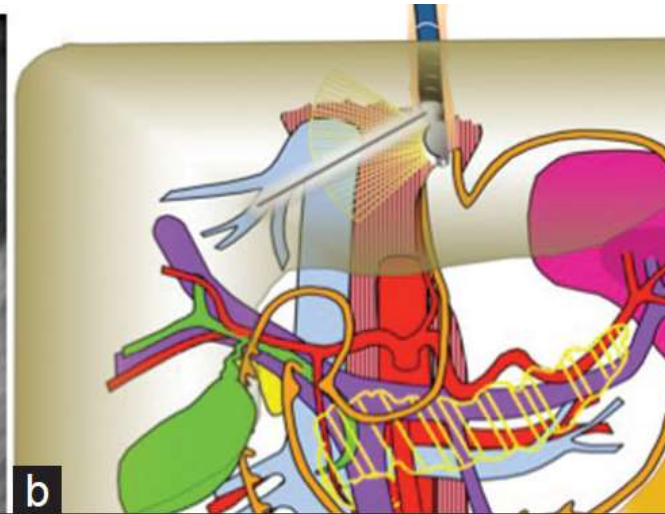
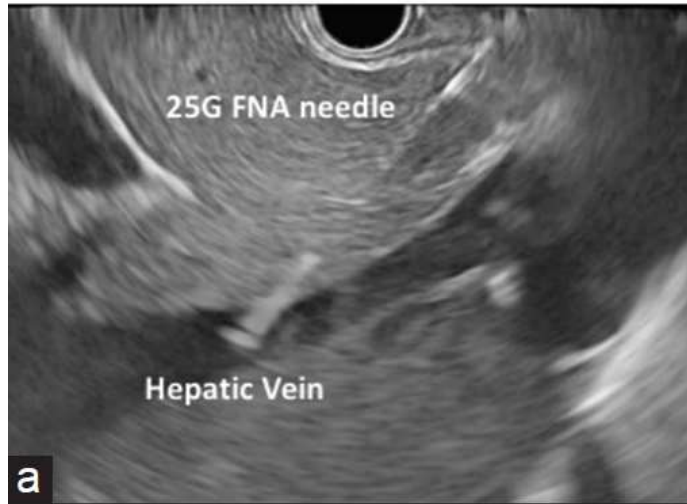
Jour of Hepatol 2021 Apr;74(4):811-818

EUS guided Portal Pressure Measurement



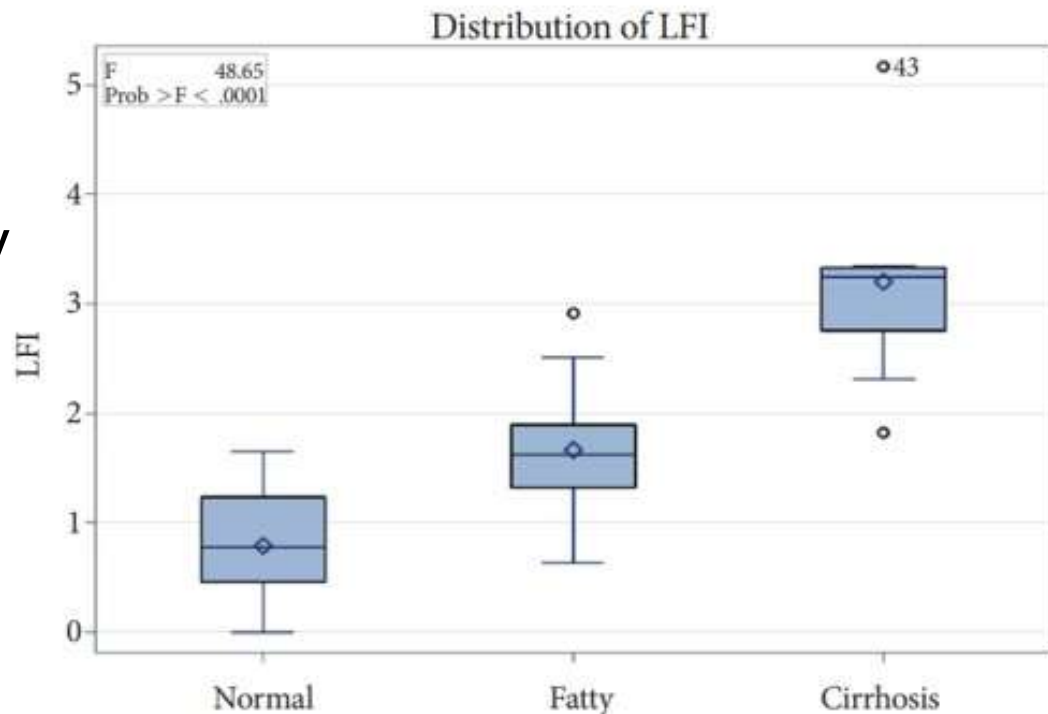
Cook Medical (Bloomington, Indiana)

EUS guided Portal Pressure Measurement



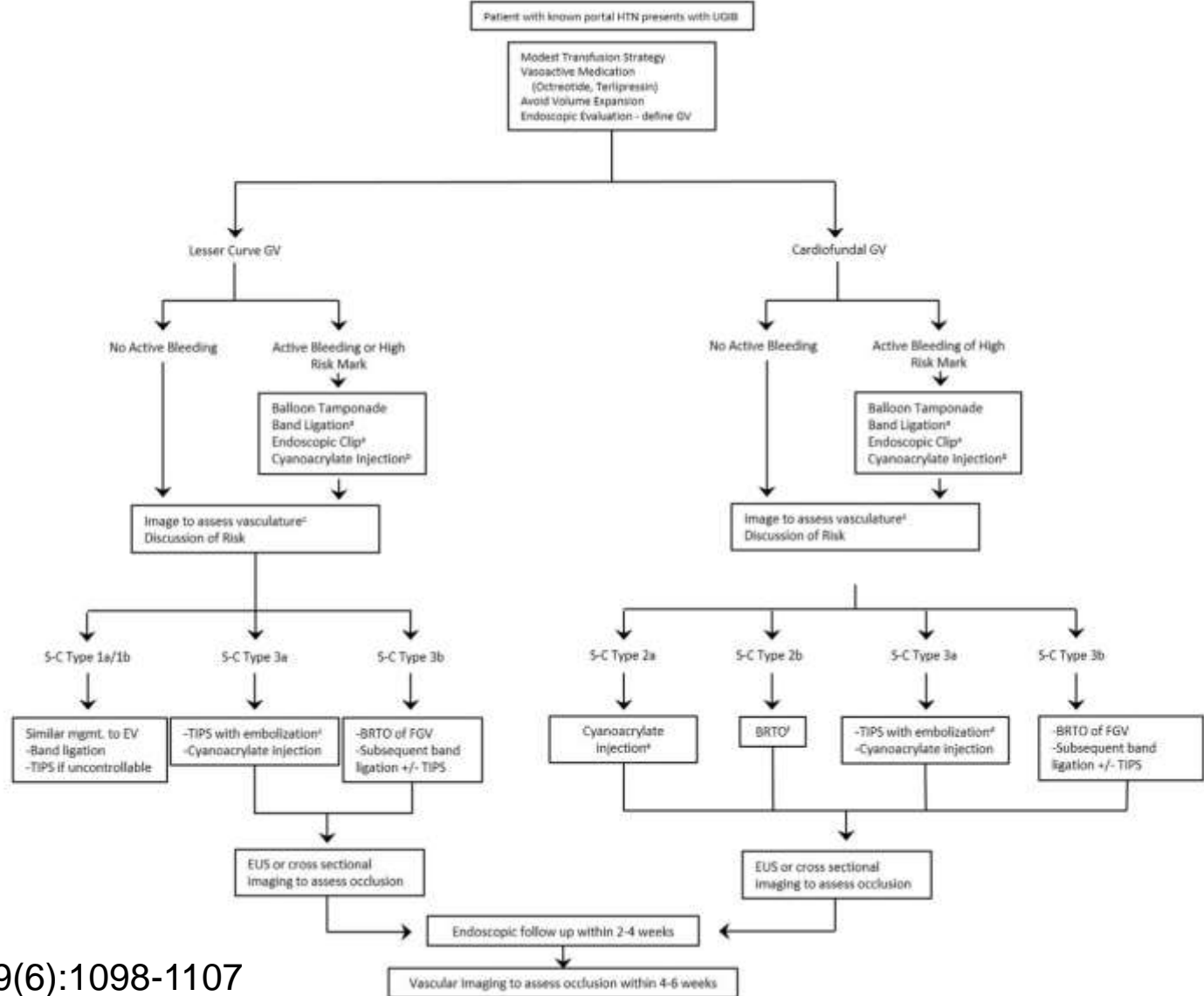
EUS guided Elastography

- Transabdominal ultrasound elastography is limited by abdominal fat/ascites
- Endosonographic-guided strain elastography can be used to calculate a liver fibrosis index (LFI) which correlates with histology and/or imaging
- Further studies needed to validate EUS-guided shear wave elastography

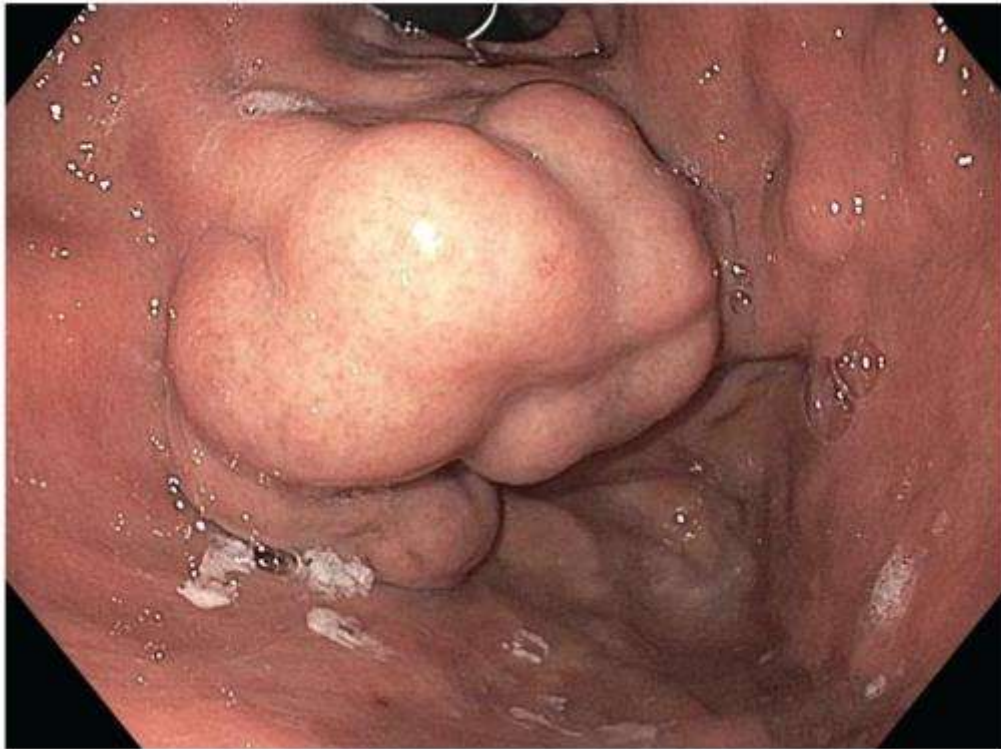


EUS guided Embolization

ALGORITHM FOR GV BLEEDING



EUS guided Embolization



Endoscopic Suturing for Weight Loss

ESG (Endoscopic Sleeve Gastroplasty) Video

- BMI >30 or >27 with comorbidities with 5-year follow-up for 68 patients showed mean total body weight loss of 15.9 % (95% CI, 11.7-20.5, $p < .001$)
- But can this help in NAFLD?

ESG in NAFLD

- One-year intragastric balloon (n=15) vs ESG (n=15)
- Follow-up period 1 year

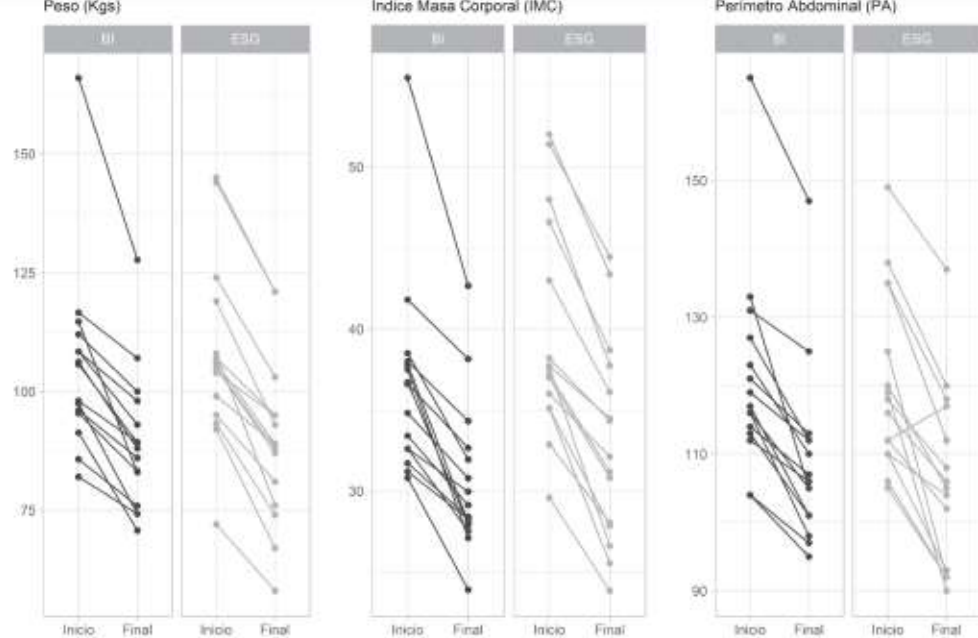


Fig. 1. Weight evolution according to treatment with IB or ESG.

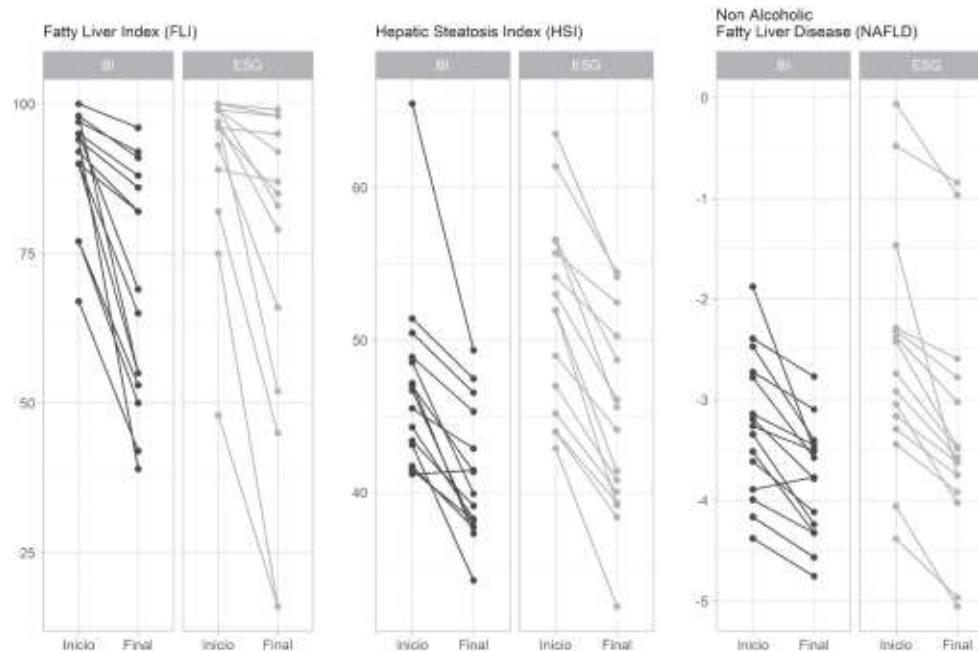


Fig. 2. FLI, HSI and NAFLD-Fibrosis Score evolution according to treatment with IB or ESG.

Rev Esp Enferm Dig. 2019
Apr;111(4):283-293.

ESG in NAFLD

Table 2. Analytical biomarkers (FLI, HSI, NAFLD-fibrosis score and FIB-4) and ultrasound parameter evolution of hepatic steatosis and fibrosis

	Total (n = 30)		IB (n = 15)		ESG (n = 15)		p comparative between IB/ ESG after 12 months
	Initial	Final	Initial	Final	Initial	Final	
<i>FLI</i>							
Total value of FLI	95 (8)	82 (38)*	94 (6)	69 (33)*	97 (8)	85 (38)*	0.280
Pts with FLI > 60%	29	20	15	9	14	11	
Pts with FLI = 30-60%	1	8	0	6	0	2	
Pts with FLI < 30%	0	2	0	0	2	2	
<i>HSI</i>							
Total value of HSI	49.4 ± 6.56	42.8 ± 5.69*	47.1 ± 6.03	41.1 ± 4.35*	51.8 ± 6.40	44.5 ± 6.49*	0.107
Pts with HSI < 30	0	0	0	0	0	0	
Pts with HSI 30-36	0	2	0	1	0	1	
Pts with HSI > 36	13	28	15	14	15	14	
<i>NAFLD-Fibrosis score</i>							
Total value of NAFLD-FS	-2.9 ± 1.02	-3.57 ± 0.95*	-3.25 ± 0.71	-3.81 ± 0.56*	-2.56 ± 1.18	-3.32 ± 1.19*	0.162
Pts with NAFLD-FS > 0.675 (F3-F4)	0	0	0	0	0	0	
Pts with NAFLD-FS -1.455-0.675	2	2	0	0	2	2	
Pts with NAFLD-FS < -1.455 (F0-F2)	28	28	15	15	13	13	
<i>FIB-4</i>							
Total value of FIB-4	0.69 ± 0.26	0.68 ± 0.26	0.71 ± 0.29	0.68 ± 0.30	0.67 ± 0.23	0.67 ± 0.24	0.924
Pts with FIB-4 < 1.30	30	29	0	14	15	15	
Pts with FIB-4 1.3-3.15	0	1	0	1	0	0	
Pts with FIB-4 > 3.15	0	0	15	0	0	0	
<i>Ultrasound</i>							
Hepatic steatosis							
Mean grade	1.80 ± 0.85	0.97 ± 1.03*	1.80 ± 0.77	0.60 ± 0.83*	1.80 ± 0.94	1.33 ± 1.11*	0.051
N° pts grade 3	8	3	3	0	5	3	
N° pts grade 2	8	6	6	3	2	3	
N° pts grade 1	14	8	6	3	8	5	
N° pts grade 0	0	13	0	9	0	4	
Subcutaneous fat (cm) by ultrasound	5.04 ± 1.58	3.98 ± 1.37*	4.76 ± 1.49 (R = 2.2-8.1)	3.79 ± 1.25* (R = 1.1-6.4)	5.31 ± 1.67 (R = 2.2-8.5)	4.16 ± 1.50* (R = 1.0-7.0)	0.475

Pts: number of patients; R: range. *p < 0.05. Values expressed as the mean ± standard deviation, except for FLI that is expressed as the median (IQR).

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Thank you for you time!

Special thanks to my mentor Kaveh Hajifathalian