EUS-Guided Shear Wave Elastography Appears to Be More Accurate Than Transient Elastography in Predicting Liver Fibrosis Staging in Patients with Obesity

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Background

- Transient elastography (TE) is a non-invasive clinical tool used to assess liver stiffness measurement (LSM) and can be correlated to liver fibrosis staging.

- Obesity can make TE challenging to perform due to increased abdominal wall thickness, with high failure rates. Fibroscan XL probes have lower failure rates, though it is unclear if readings are reliable or correlate well with liver biopsies.

- EUS guided shear wave elastography (EUS-SWE) can potentially circumvent this limitation, as liver parenchyma via EUS can be visualized under a thin subcentimeter gastric wall, which does not change appreciably with body habitus.

Aim

- We aim to determine whether TE or EUS-SWE correlate better with liver biopsy fibrosis staging for patients with obesity.

Methods

- Retrospective cohort study

- Inclusion criteria: All patients with obesity (BMI ≥30) with LSM on TE concerning for moderate fibrosis or higher (i.e. F2 or greater) and were referred for EUS-SWE and liver biopsies

- LSM (reported in kPa) were correlated with fibrosis staging on liver biopsy via the following cutoff ranges: kPa <8.2 = F0-1, kPa 8.2-9.6 = F2, kPa 9.7-13.6 = F3, and kPa >13.6 = F4.

- No established cutoffs exist for EUS-SWE, so stiffness values were compared to that for TE on which were closer to TE cutoff ranges.

Results

- 12 consecutive patients with obesity underwent TE, EUS-SWE, and EUS guided liver biopsy.

- The mean age was 55.3 [range 18-69], 9 (75%) were females, and mean BMI was 44.9 [range 30.2-67.8]. LSM ranged from 9.1 to 41.9 kPa.

- Only 2 (17%) patients' TE results correlated accurately with liver fibrosis staging on biopsy based on established cutoffs. Assuming similar fibrosis staging cutoff ranges for TE, EUS-SWE accurately downgraded 6 (50%) patients, upgraded 1 (8%) patient, and were no different compared to TE for 5 (42%) patients. EUS-SWE was closer to biopsy LSM cutoffs for 8 (67%) patients, while TE was more accurate in only 1 (8%) patient.

Patient #	Age	Gender	BMI	Fibrosis Stage on Biopsy	Expected Range of TE LSM Value (kPa)	TE LSM Value (kPa)	Fibrosis Staging Based on TE Cutoff	TE LSM as Compared to Fibrosis Staging on Biopsy	EUS-SWE Stiffness (kPa)	Closer to Expected Range? TE vs EUS-SWE	How Did EUS-SWE Compare to TE via Fibrosis Staging?
1	58	Female	62.4	F0	<8.2	9.1	F2	Overstaged	5.03	EUS-SWE	Downgraded
2	68	Female	39.0	F0	<8.2	9.9	F3	Overstaged	4.91	EUS-SWE	Downgraded
3	59	Female	32.6	F0	<8.2	9.4	F2	Overstaged	6.33	EUS-SWE	Downgraded
4	63	Female	32.8	F0	<8.2	15.7	F4	Overstaged	7.25	EUS-SWE	Downgraded
5	48	Male	67.8	F0	<8.2	41.9	F4	Overstaged	7.3	EUS-SWE	Downgraded
6	63	Female	38.0	F0	<8.2	9.4	F2	Overstaged	2.04	EUS-SWE	Downgraded
7	56	Male	43.6	F3	9.7-13.5	9.6	F2	Understaged	10.5	EUS-SWE	Upgraded
8	18	Female	61.1	F2	8.2-9.6	34.6	F4	Overstaged	19.6	EUS-SWE	No Change
9	53	Female	32.6	F4	≥13.6	20.5	F4	Appropriate Stage	21.7	Same	No change
10	41	Female	33.1	F2	8.2-9.6	8.9	F2	Appropriate Stage	8.5	Same	No change
11	55	Male	34.9	F2	8.2-9.6	12.2	F3	Overstaged	12.2	Same	No Change
12	53	Female	30.2	F3	9.7-13.5	14	F4	Overstaged	15.2	TE	No Change

Conclusions

- In this small cohort of patients with obesity with possible moderate fibrosis or higher, TE appeared to overcall higher fibrosis stages, whereas EUS-SWE was closer to the actual fibrosis stage on biopsy, assuming similar LSM cutoffs to TE.

- Larger cohort studies are ongoing to allow proper interpretation of EUS-SWE stiffness values and compare its utility and accuracy to TE.