ACOUSTIC RADIATION FORCE IMPULSE IMAGING - THE "NORMAL" VARIABILITY BETWEEN TWO MEASUREMENTS

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Background: Acoustic Radiation Force Impulse Imaging (ARFI) is a new technique used for the assessment of liver fibrosis. We aimed to establish what difference between two measurements arises from the technique itself and what difference should be considered significant in terms of improvement or aggravation of a disease.

Methods and patients: We analyzed the data of 136 patients with different liver diseases or without any known disease who underwent two consecutive sets of 10 ARFI measurements each, performed by the same experienced operator. Only measurements considered valid, with interquartile range (IQR) less than 30% of the median value of 10 measurements were included. The cut-offs were set at 1.34 m/s for F>=2 and 2 m/s for F4.

Results: The intraclass correlation coefficient (ICC) for the two measurements was 0.975 (CI95%=0.965–0.982, p<0.001) showing an excellent intraoperator reproducibility. We found a mean variation between two consecutive complete sets of measurements of 9.59% with standard deviation 9.29. The disagreement between two measurements was significantly influenced by BMI (p=0.01, r=0.320) and not by sex, etiology or age.

	Minimum	Maximum	Number / Mean±Standard deviation
Patients number	-	-	136
Male	-	-	71 (52.2%)
Age (years)	17	82	52.88±14.7
ALT	11	123	38.46±25.45
AST	12	169	31.73±24.46
GGT	7	455	46.78±58.74
Platelets (x10^3/mmc)	60	392	225±58
BMI	15.2	38.6	25.92±4.36

Table 1. Characteristics of the patients

	Minimum	Maximum	Number / Mean±Standard deviation
1st set median (m/s)	0.67	3.39	1.46±0.67
1st set IQR	0.03	1.29	0.32±0.25
1st set valid (IQR<30%)	-	-	123 (90.44%)
2nd set median (m/s)	0.67	3.82	1.51±0.72
2nd set IQR	0.01	1.66	0.30±0.26
2nd set valid (IQR<30%)	-	-	128 (94.11%)
20 hits median	0.68	3.64	1.48±0.68
20 hits IQR	0.04	1.44	0.34±0.27
20 hits valid	-	-	119 (87.5 %)

Table 2. ARFI measurements summary

Based on the mentioned cut-offs, 11 patients (8.08%) were differently classified by the two measurements as significant/non-significant fibrosis (F>=2/F<=2) while for F4, only one patient (0.73%)was considered cirrhotic by one measurement and non-cirrhotic by the other.
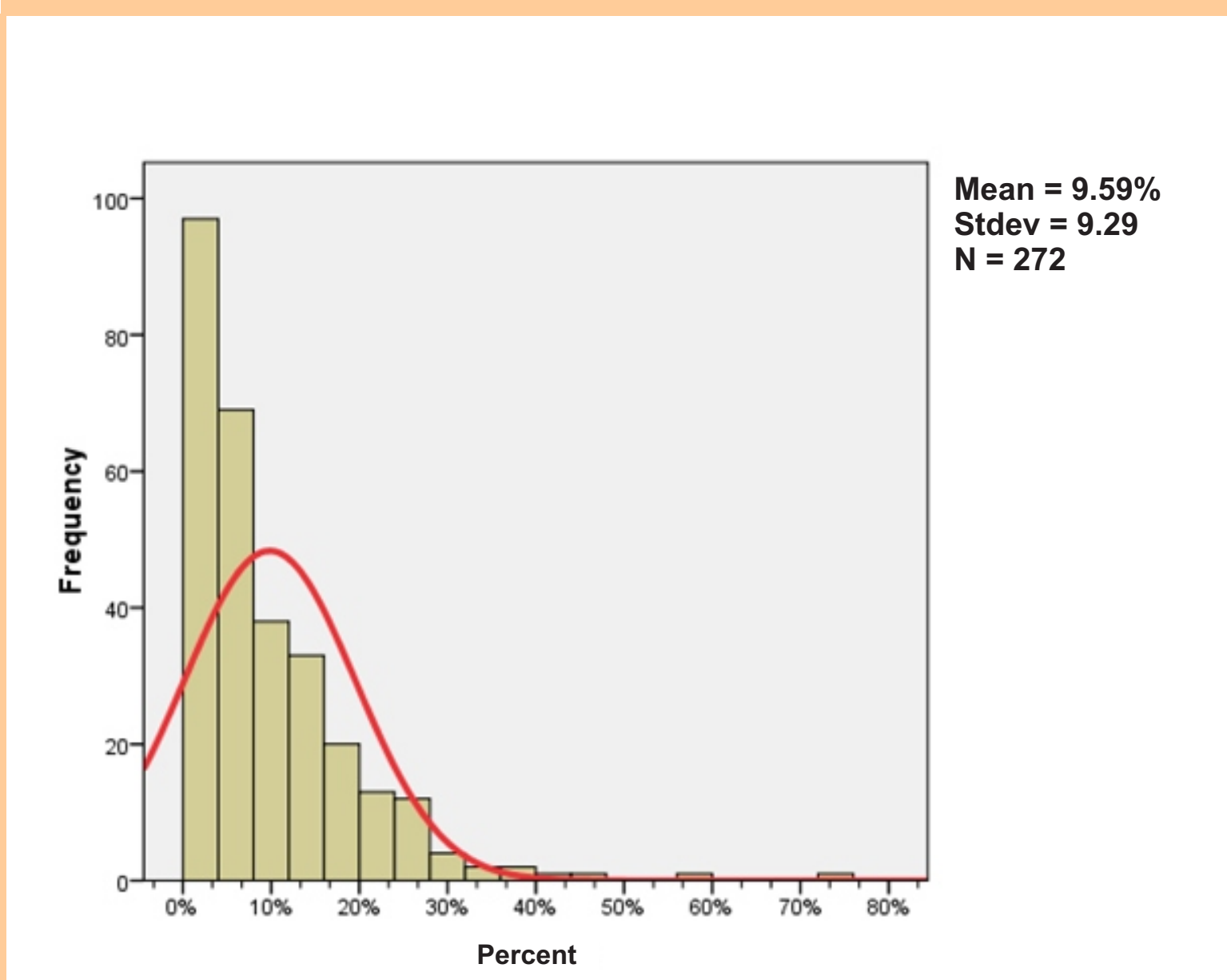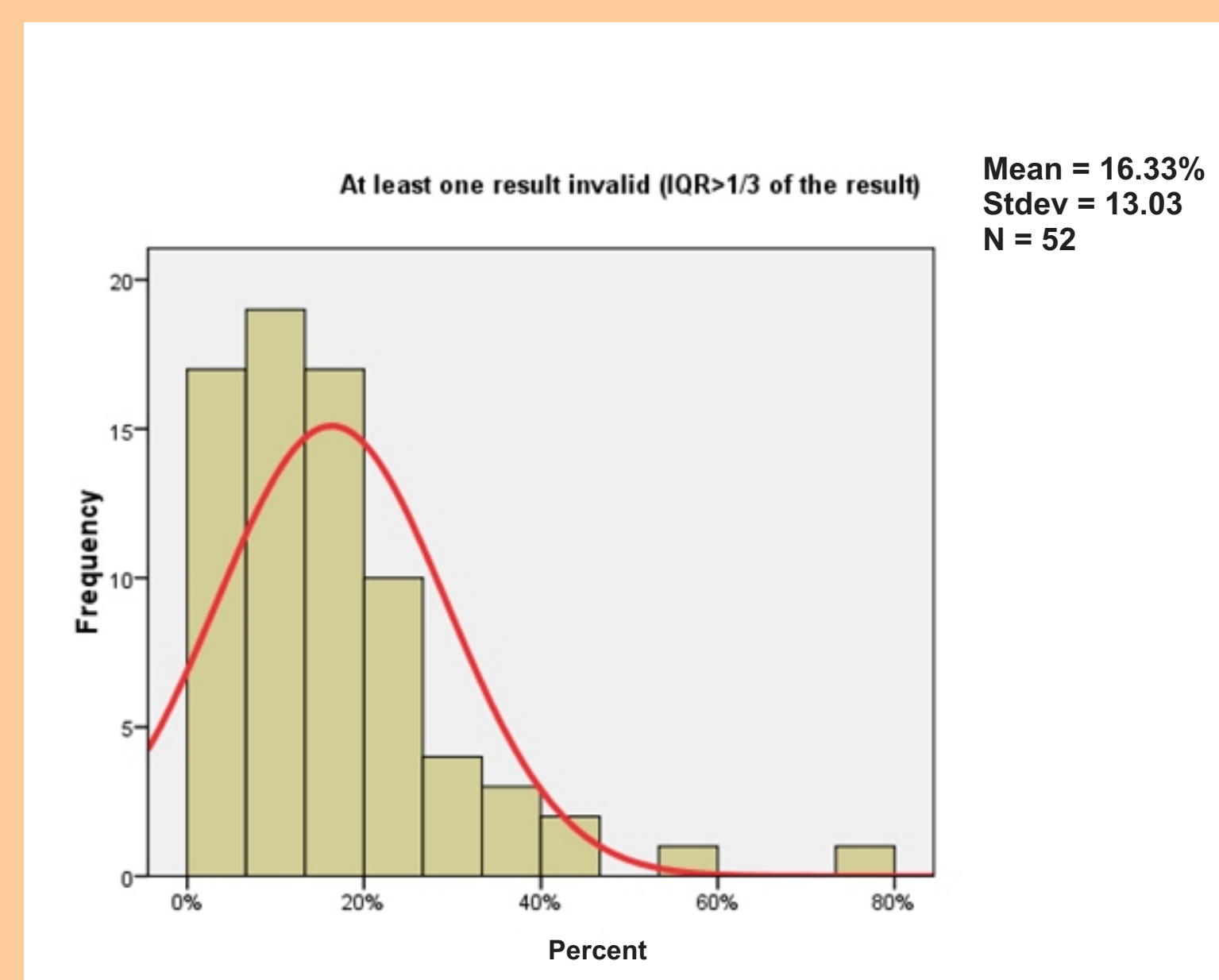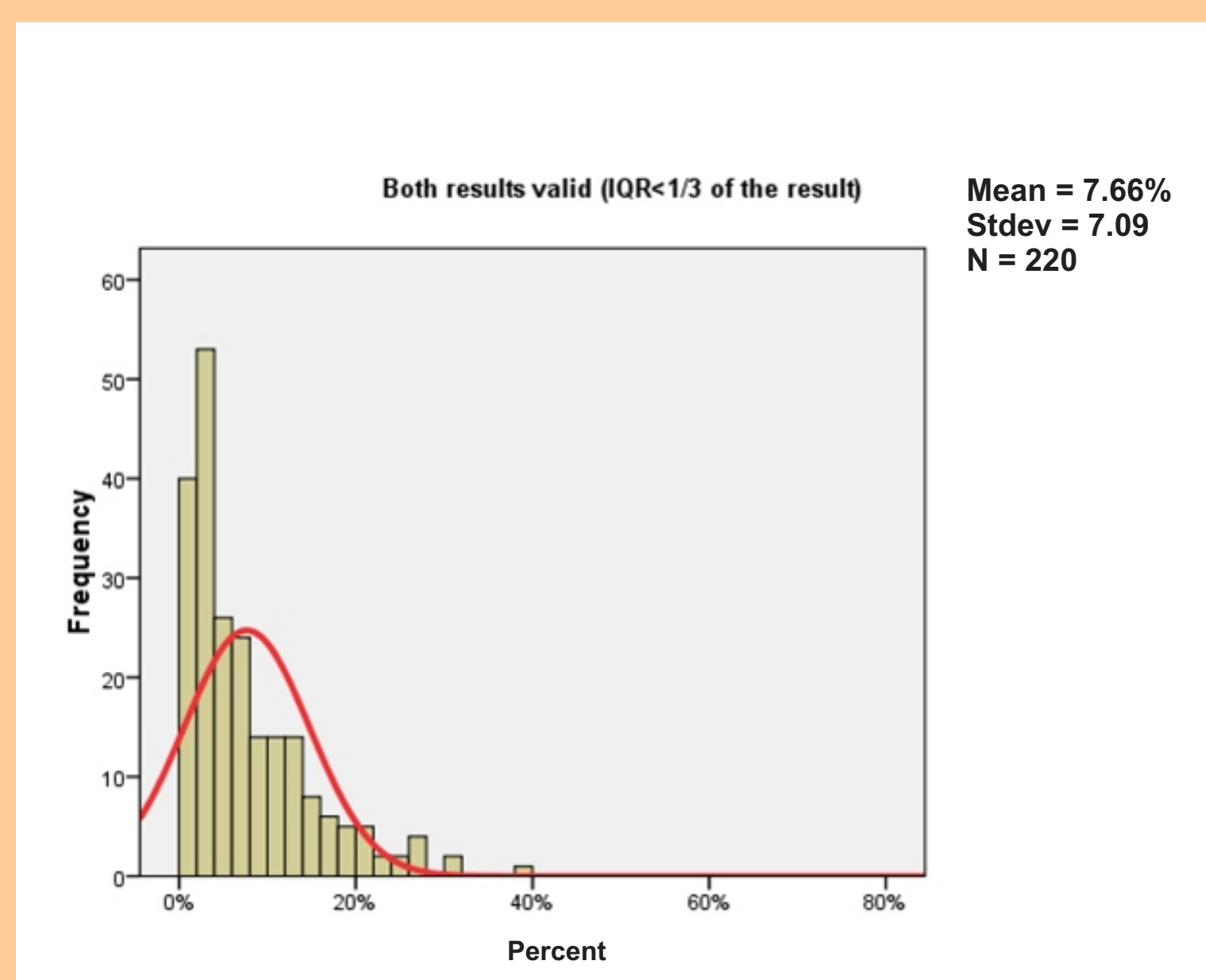
Conclusions: We found a normal variability between two liver stiffness ARFI measurements performed by the same operator of 9.59% +/- 9.29%. Therefore, only a variation of over 18.88 % should be considered significant as a proof of a liver disease improvement or worsening.

Disclosure: Nothing to disclose