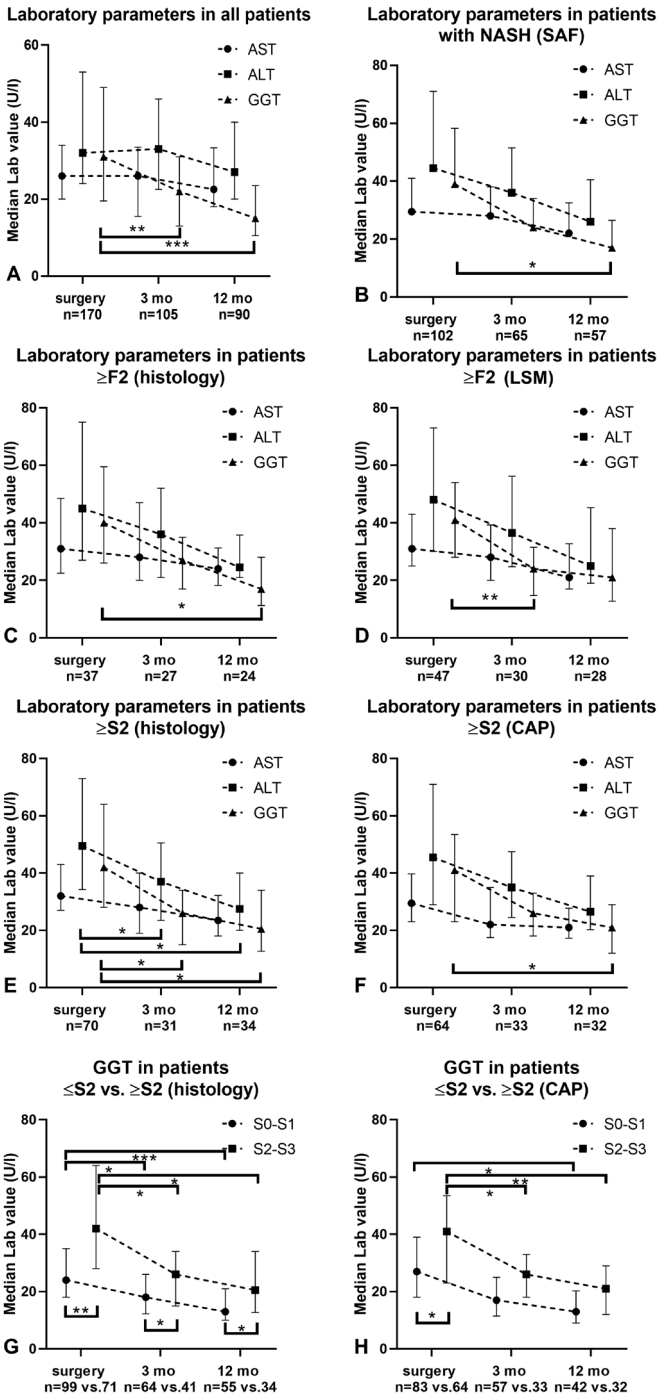

Figure S1 Evolution of laboratory values in NASH, significant fibrosis ≥F2 and steatosis ≥S2 according to histology, LSM and CAP™. All groups were statistically compared, and significant differences marked by asterisks *, P<0.05; **, P<0.01; ***, P<0.001. GGT was significantly decreased over time, in NASH patients, significant fibrosis and steatosis. Laboratory courses were similar in stratifications according to histology versus LSM or CAP™. CAP™ for steatosis grades ≥S2 was calculated by determination of a cutoff (350.0 d/m) by Youden Index. The cutoff (8.3 kPA) for ≥F2 was calculated by Youden Index as for patients with a BMI <44.4 kg/m² due the higher sensitivity and specificity. AST, aspartate aminotransferase; ALT, alanine aminotransferase; GGT, gamma-glutamyl transferase; S, steatosis grade; NASH, Non-alcoholic steatohepatitis, SAF, Steatosis, Activity and Fibrosis score.

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Table S1 LSM and CAP™ results stratified according to histopathology

	LSM (kPA, PP), N=154		CAP™ (dB/m, PP), N=134
Liver histology (CRN)		Liver histology (CRN)	
Fibrosis		Fibrosis	
F0-1; median (Q1; Q3)	6.1 (4.8; 8.3)	F0-1; median (Q1; Q3)	332.0 (300.0;375.0)
F2; median (Q1; Q3)	7.4 (5.5; 10.9)*	F2; median (Q1; Q3)	345.0 (326.3;379.3)
≥F3; median (Q1; Q3)	12.8 (7.0; 18.1)*	≥F3; median (Q1; Q3)	333.0 (301.5;360.5)
P value (ANOVA) Post hoc analysis	P=0.001 F1/3 P=0.001; F2/3 P=0.029	P value (ANOVA)	P=0.478
≥F2; median (IQR)	8.5 (6.5; 13.3)	≥F2; median (IQR)	342.0 (318.0;375.0)
≥F3; median (IQR)	12.8 (7.0; 18.1)	≥F3; median (IQR)	333.0 (301.5;360.5)
P value (t-test)	≥F2 P=0.004 ≥F3 P=0.011	P value (t-test)	≥F2 P=0.362 ≥F3 P=0.920
Steatosis		Steatosis	
S0; median (Q1; Q3)	5.0 (3.6;6.5)	S0; median (Q1; Q3)	308.0 (267.0;347.5)
S1; median (Q1; Q3)	6.1 (4.8;7.9)	S1; median (Q1; Q3)	327.0 (294.0;362.0)
S2; median (Q1; Q3)	7.6 (6.1;11.1)*	S2; median (Q1; Q3)	346.0 (309.0;380.0)*
S3; median (Q1; Q3)	8.7 (5.8;13.0)*	S3; median (Q1; Q3)	373.5 (342.5; 395.8)*
P value(ANOVA) Post hoc t-test	P=0.013 S0/2: P=0.042, S0/3: P=0.02	P value (ANOVA) Post hoc t-test	<0.001 S0/2: P=0.034, S0/3: P<0.001, S1/3:P=0.002
NAFLD according to NAS		NAFLD according to NAS	
0-2 (no NASH)	5.6 (4.5;7.6)	0-2 (no NASH)	307.5 (270.5; 338.8)
3-4 (Borderline)	6.2 (5.0;8.4)	3-4 (Borderline)	342.0 (308.5; 384.0)*
5-8 (NASH)	8.8 (6.6;13.5)*	5-8 (NASH)	371.0 (340.5; 393.5)*
P value (ANOVA) Post hoc Analysis	P=0.009 No NASH *vs.* NASH: P=0.009	P- value (ANOVA) Post hoc Analysis	<0.001 No NASH *vs.* Borderline:P<0.001 No NASH *vs.* NASH: P<0.001
NAFLD according to SAF (FLIP Algorithm)		NAFLD according to SAF (FLIP Algorithm)	
no Steatosis/NAFL	4.8 (3.6; 6.1)	no Steatosis/NAFL	300.0 (261.8; 334.8)
NAFL	6.2 (5.1;8.1)*	NAFL	311.0 (290.3; 354.3)
NASH	6.9 (5.3;11.1)*	NASH	361.5 (327.3; 392.0)
P value (ANOVA) Post hoc Analysis	P=0.013 No NAFL *vs.* NAFL: P=0.007 No NAFL *vs.* NASH <0.001	P value (ANOVA) Post hoc Analysis	<0.001 NAFL *vs.* NASH: P<0.001

VCTE values increased with higher fibrosis, but also with higher steatosis grades according to CRN. LSM was increased with higher NAS (NASH) and SAF (NAFLD, NASH) (per protocol analysis). CAP™ values increased with higher steatosis grades according to CRN, with NAS (NASH and borderline NASH) and SAF (NASH) (per protocol analysis. Asterisks indicate significant differences in relation to baseline. SAF, Steatosis, Activity and Fibrosis score; NAS, NAFLD Activity Score; NAFL, Non-alcoholic fatty liver; NASH, Non-alcoholic steatohepatitis; CAP™, Controlled Attenuation Parameter; kPA, kilopascal. *, XXXXXXXXXXX.

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Table S2 Factors influencing liver stiffness measurement (LSM) and controlled attenuation parameter (CAP) assessed by multivariate linear regression analysis

	LSM					CAP			
	Unadjusted regression coefficient (95% CI)	P value	Adjusted regression coefficient (95% CI)	P value		Unadjusted regression coefficient (95% CI)	P value	Adjusted regression coefficient (95% CI)	P value
BMI	0.212 (0.046; 0.307)	0.008	0.115 (-0.005; 0.236)	0.061	BMI	0.250 (0.676; 3.368	0.004	1.749 (0.542; 2.956)	0.005
Steatosis (total)	0.214 (0.009; 0.059)	0.008	0.023 (-0.027; 0.073)	0.112	Fibrosis	0.196 (1.504; 20.379)	0.023		
Macrovesicular steatosis	0.292 (0.02; 0.73)	0.001	0.02 (-0.035; 0.075)	0.750	HbA1c	0.236 (1.92; 14.615)	0.011	8.128 (1.442; 14.814)	0.018
HbA1c	0.175 (0.027; 1.480)	0.042			HOMA-IR	0.210 (0.116; 1.758)	0.026		
GGT	0.170 (0.001; 0.037)	0.036			GGT	0.183 (0.014; 370)	0.035		
HDL	0.190 (-128; -0.008)	0.026			HDL	0.243 (-1.342; -0.207)	0.008	-0.528 (-1.138; 0.082)	0.089
LDL	0.180 (-0.055; -0.001)	0.039			TG	0.262 (0.052; 0.241)	0.003	0.025 (-0.071; 0.12)	0.609

Following parameters were analyzed by the univariate linear regression analysis: platelets, aspartate aminotransferase; alanine aminotransferase; gamma-glutamyl transferase (GGT); High-density lipoprotein (HDL); Low-density lipoprotein (LDL); glycosylated hemoglobin (HbA1c); Homeostatic Model Assessment for Insulin Resistance (HOMA-IR), ferritin, albumin, total cholesterol, triglycerides (TG), fibrosis grade (for CAP™); total, microvesicular and macrovesicular steatosis (for LSM), patients' age and body mass index (BMI). Only significant values from the regression are listed. Adjusted regression coefficient was then assessed for all parameters with a significance level of $P<0.02$. All P values are given for parameters that were included in the multivariate linear regression. Statistical significance was reached at $P\leq0.05$. CI, confidence interval.

Table S3 Changes of laboratory parameters over time

Laboratory parameters	Prior to surgery (N=170)	3 months post-surgery (N=106)	P value baseline *vs.* 3 months	12 months post-surgery N=91	P value baseline *vs.* 12 months
Platelets (G/L), median (Q1; Q3)	269.5 (225.8; 319.0)	250.5 (217.5; 293.0)	0.017	252.0 (212.0; 282.0)	0.003
AST (U/L), median (Q1; Q3)	26.0 (20.0; 34.0)	26.0 (18.5; 33.5)	0.541	22.5 (18.0; 33.3)	0.631
ALT (U/L), median (Q1; Q3)	32.0 (24.0; 53.0)	33.0 (22.5; 46.0)	0.508	27.0 (20.0; 40.0)	0.211
GGT (U/L), median (Q1; Q3)	31 (19.5; 49.0)	22.0 (13.0; 31.0)	<0.001	15.0 (10.5; 23.5)	<0.001
Ferritin (ng/mL), median (Q1; Q3)	86.4 (48.0; 167.0)	110.6 (53.9; 147.0)	0.742	77.1 (29.1; 126.0)	0.055
Albumin (g/L), median (Q1; Q3)	42.4 (40.4; 44.5)	42.4 (40.5; 44.8)	0.344	42.3 (39.6; 44.1)	0.061
Total cholesterol (mg/dl), median (Q1; Q3)	177.5 (150.8; 200.5)	156.5 (137.0; 178.0)	<0.001	154.0 (139.3; 171.0)	<0.001
HDL (mg/dL), median (Q1; Q3)	42.0 (35.0; 50.0)	40.0 (34.0; 48.0)	0.045	52.5 (45.0; 61.5)	<0.001
LDL (mg/dL), median (Q1; Q3)	111.8 (87.7; 129.8)	89.6 (74.6; 106.8)	<0.001	81.9 (69.4; 102.6)	<0.001
Triglycerides (mg/dL), median (Q1; Q3)	132 (100.5; 195.0)	110.0 (86.0; 143.5.0)	<0.001	85.0 (67.0; 111.5)	<0.001
HbA1c (%), median (Q1; Q3)	5.6 (5.4; 6.4)	5.2 (4.9; 5.5)	<0.001	5.0 (4.8; 5.3)	<0.001
HbA1c >6.5%, % (n)	20.9 (31/148)	2.0 (2/100)	<0.001	1.23 (1/81)	<0.001
HOMA-IR, median (Q1; Q3)	6.0 (3.7; 12.1)	2.3 (1.4; 3.6)	<0.001	1.5 (1.0; 2.3)	<0.001
HOMA-IR >2.5, % (n)	87.6 (129/146)	47.9 (45/94)	<0.001	21.1 (16/76)	<0.001

Statistical differences between preoperatively at the day of surgery were compared to 3 and 12 months postoperatively, respectively (T- Test for parametric, Mann-Whitney U – Test for non-parametric data). In our study we were able to reproduce previously reported postoperative improvement of blood lipids, glucose homeostasis and GGT as typical for patients after bariatric-metabolic surgery (45-47). The transaminases AST and ALT did not significantly decrease three and 12 months after bariatric surgery in contrast to the Swedish Obese Subjects (SOS) Study (47). GGT was significantly reduced over time as in line with the study by Dixon et al that identified GGT as a predictor of histologic improvement (43). VCTE, Vibration controlled transient elastography; AST, aspartate aminotransferase; ALT, alanine aminotransferase; GGT, gamma-glutamyl transferase; HDL, High-density lipoprotein; LDL, Low-density lipoprotein; HbA1c, glycosylated hemoglobin; HOMA-IR, Homeostatic Model Assessment for Insulin Resistance.

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