

Valutazione della stiffness epatica con tecnica elastosonografica real-time shear wave in pazienti obesi candidati a chirurgia bariatrica: *studio pilota*



Simone  
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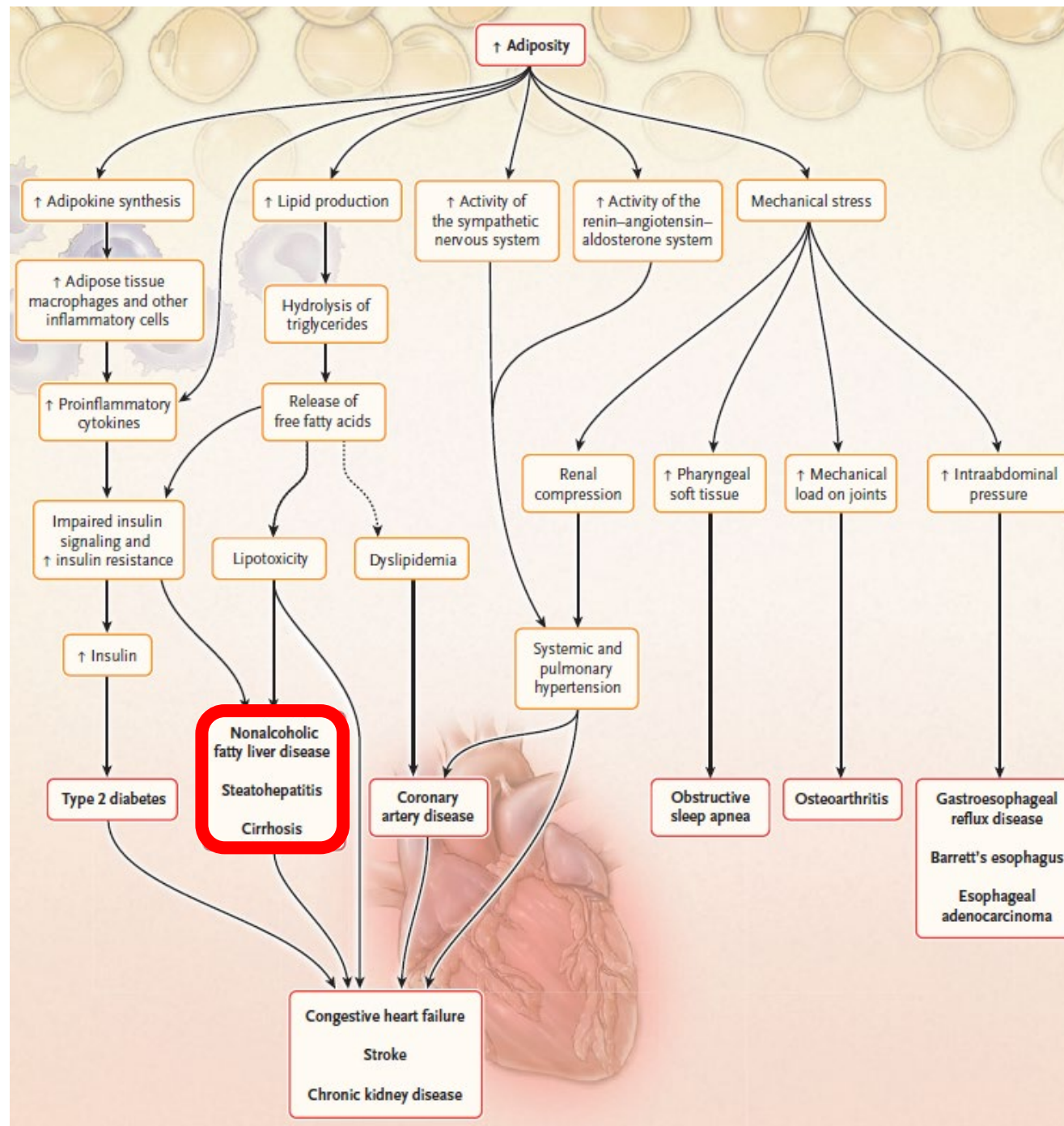
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# Scopo dello studio

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Scopo di questo studio pilota è acquisire dati quantitativi elastosonografici che caratterizzino il quadro epatico di pazienti obesi candidati alla chirurgia bariatrica con lo scopo di confrontarli con quelli post-operatori.



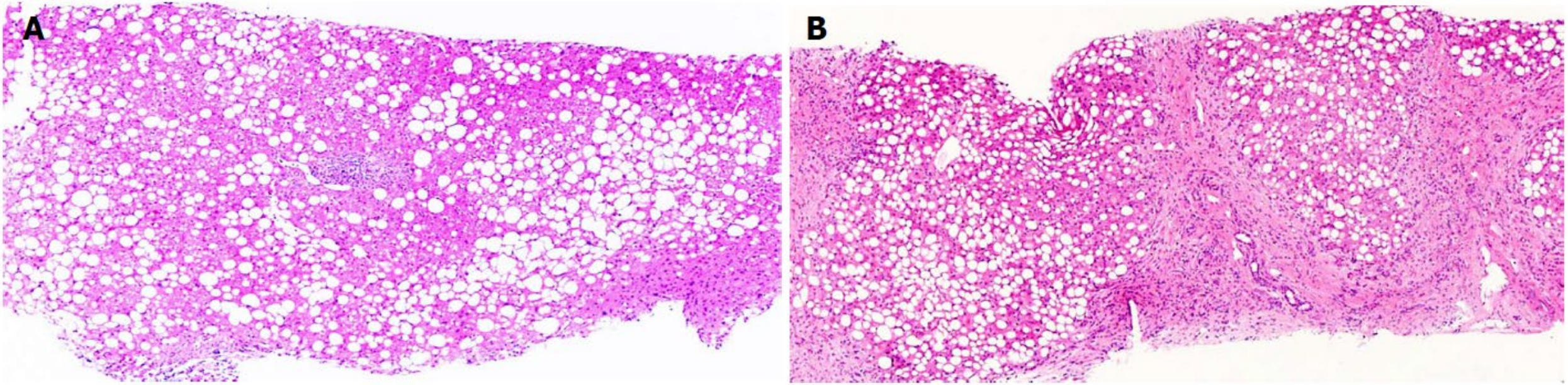


Heymfield SB, Wadden TA. Mechanisms, Pathophysiology, and Management of Obesity. *N Engl J Med.* 2017 Jan 19;376(3):254-266. doi: 10.1056/NEJMra1514009. PMID: 28099824.

# NAFLD: definizione

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La steatosi epatica non alcolica (NAFLD) è definita come la presenza di grasso nel fegato (steatosi epatica) all'imaging o all'istologia epatica dopo l'esclusione delle cause secondarie di accumulo di grasso nel fegato (i.e., consumo significativo di alcol, alcuni farmaci, e altre condizioni mediche). La NAFLD è ulteriormente classificata istologicamente in **steatosi epatica non alcolica (NAFL)** e **steatoepatite non alcolica (NASH)**. La NAFL è definita come la steatosi epatica senza evidenza di danno epatocellulare sotto forma di gonfiore degli epatociti. La NASH è definita come la presenza di steatosi epatica e infiammazione con danno epatocitario (ballooning) con o senza fibrosi.



**Figure 1** Pathological changes of liver simple steatosis and cirrhosis. A: 45-year-old man with simple steatosis. The liver biopsy shows marked macrovesicular steatosis without inflammation or fibrosis (H and E x4); B: 48-year-old man with cirrhosis due to non-alcoholic fatty liver disease. In addition to marked macrovesicular steatosis, there is loss of normal hepatic architecture and replacement by regenerative nodules surrounded by bands of fibrous tissue, a characteristic feature of cirrhosis (H and E x4).

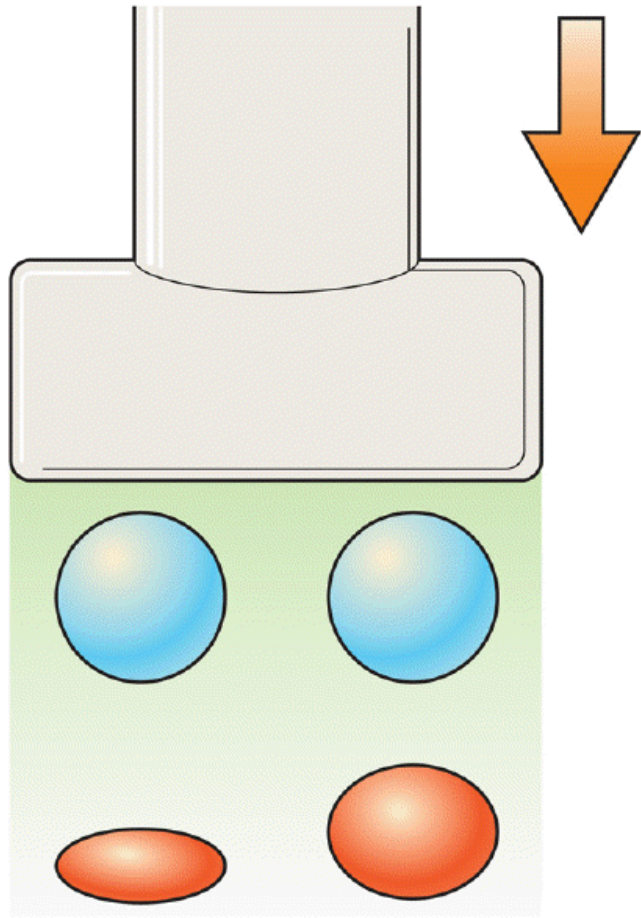


17-33%

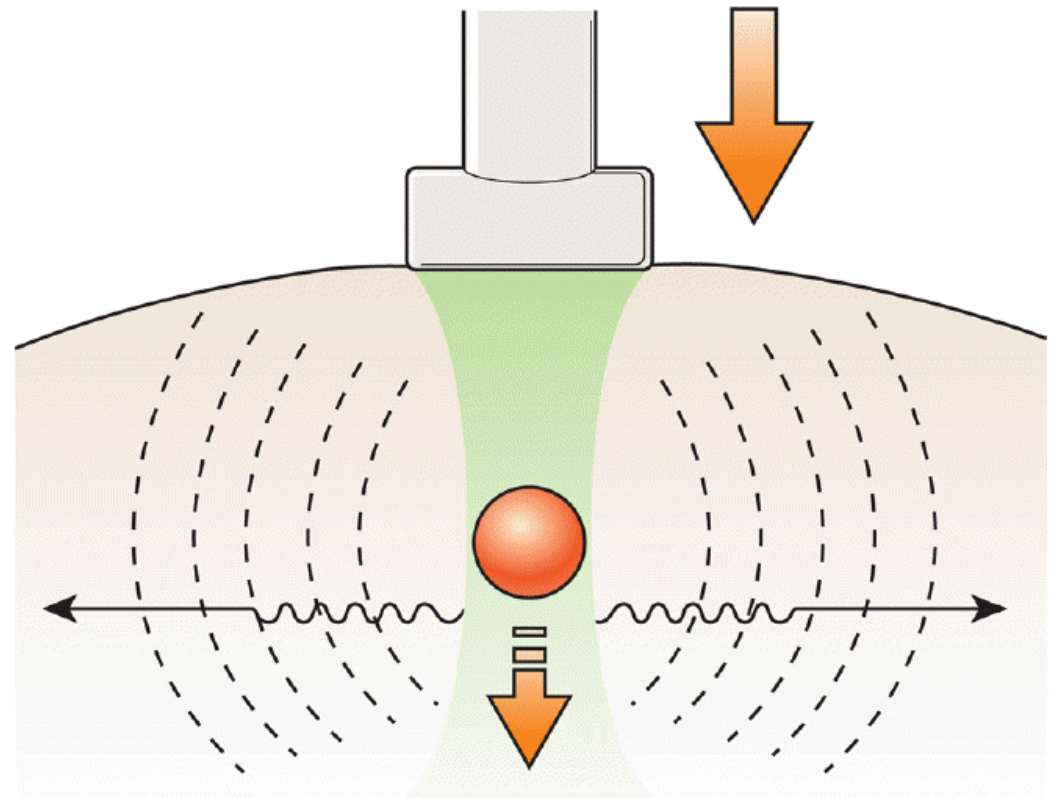
**Table 1 Summary table for the value of conventional and elastographic imaging modalities in non-alcoholic fatty liver disease stratification**

Modality	Steatosis assessment	Fibrosis assessment	SS / NASH differentiation
Conventional imaging			
US	Not quantitative <sup>1[30]</sup> : Sensitivity 79.7%, Specificity 86.2%	No for fibrosis, but can detect cirrhosis with high sensitivity	No
CT	Quantitative <sup>2[38]</sup> : Sensitivity 82%, Specificity 100%	Semi-quantitative for fibrosis, but can detect cirrhosis with high sensitivity <sup>[39]</sup>	No
MRI	Quantitative <sup>3</sup> : Sensitivity 76.7%-90.0%, Specificity 87.1%-91% <sup>[40,41]</sup>	No for fibrosis, but can detect cirrhosis with high sensitivity	No
Elastographic imaging			
TE / CAP	Sensitivity 82%, Specificity 91% <sup>4[42]</sup>	Advanced Fibrosis <sup>[43]</sup> : Sensitivity 91%, Specificity 75%	No
USE	-	Advanced Fibrosis <sup>[44]</sup> : Sensitivity 100%, Specificity 91%	No
MRE	Sensitivity 90%, Specificity 93.3% <sup>5[42]</sup>	Advanced Fibrosis <sup>[45]</sup> : Sensitivity 100%, Specificity 92%	Yes <sup>5[46]</sup> : Sensitivity 94%, Specificity 73%

<sup>1</sup>Gray-scale US detecting steatosis (more than 20% of hepatocytes involved in fat infiltration); <sup>2</sup>Non-contrast CT detecting steatosis; <sup>3</sup>MRI detecting liver histological steatosis; <sup>4</sup>Evaluated by CAP based on TE; <sup>5</sup>MRE discriminating steatosis from NASH using a threshold of 2.74 kPa. SS: Simple steatosis; NASH: Non-alcoholic steatohepatitis; US: Ultrasonography; CT: Computed tomography; MRI: Magnetic resonance imaging; TE: Transient elastography; CAP: Controlled attenuation parameter; USE: Ultrasound elastography; MRE: Magnetic resonance elastography.



A **STRAIN**




B **SHEAR WAVE**





# Measurement of Liver Stiffness with 2D-Shear Wave Elastography (2D-SWE) in Bariatric Surgery Candidates Reveals Acceptable Diagnostic Yield Compared to Liver Biopsy

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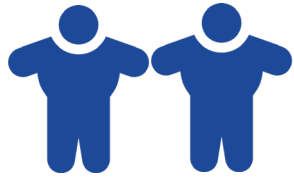
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# Metodi

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Studio approvato dal Comitato Etico dell'IRCCS Ospedale San Raffaele.



Pazienti candidati a chirurgia bariatrica e senza cause secondarie di accumulo di grasso nel fegato.

Raccolti dati antropometrici (peso e altezza).



Eseguito esame ecografico ed elastosonografico, tramite ecografo Samsung RS80 Prestige (Seoul, South Korea).

# Metodi

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Radiology

REVIEWS AND COMMENTARY • STATEMENTS AND GUIDELINES



## Update to the Society of Radiologists in Ultrasound Liver Elastography Consensus Statement

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Conflicts of interest are listed at the end of this article.

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# Risultati preliminari: arruolamento

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78 soggetti elegibili da dicembre 2019 a  
ottobre 2020

27 esclusi

51 arruolati

Età media:  $43.0 \pm 9.6$  anni

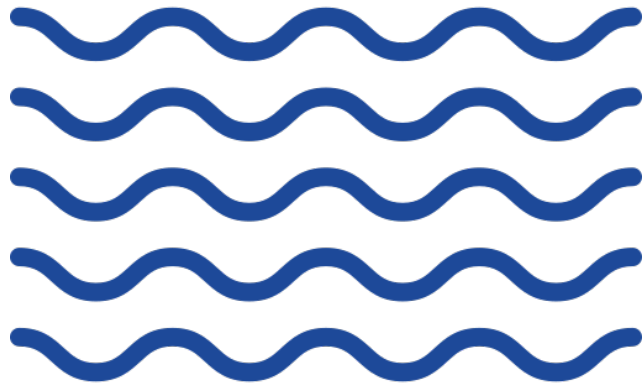
F/M: 37/51

18 pazienti obesi di classe II

32 pazienti obesi di classe III

1 paziente privo di dati disponibili

# Risultati preliminari: rigidità epati



Mediana:  $17.67 \pm 6.65$  kPa

Primo quartile:  $13.33 \pm 5.22$  kPa

Terzo quartile:  $23.47 \pm 9.49$  kPa

IQR:  $10.14 \pm 6.18$  kPa

# Conclusioni (preliminari)

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Le misurazioni elastosonografiche si sono rilevate solo relativamente affidabili, con un IQR medio di  $10.14 \pm 6.18$  kPa.

Maggiori valutazioni potranno essere effettuate confrontando i risultati preoperatori con quelli postoperatori a 6, 12, e 18 mesi dall'intervento.

I valori di stiffness registrati sono molto alti, se confrontati con i dati pubblicati su pazienti obesi, ma necessitano di cut off



GRAZI  
E

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