

## **Acoustic radiation force impulse: a new ultrasonographic technology for the widespread noninvasive diagnosis of liver fibrosis:**

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Auteur	Boursier, J�r�me [1], Isselin, Gael [2], Fouchard-Hubert, Isabelle [3], Oberti, Fr�d�ric [4], Dib, Nina [5], Lebigot, J�r�me [6], Bertrais, Sandrine [7], Gallois, Yves [8], Cal�s, Paul [9], Aub�, Christophe [10]
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## Résumé en anglais

Background/aims: As a module of a standard ultrasound imaging device, acoustic radiation force impulse (ARFI) is a new technology for liver stiffness evaluation (LSE). We aimed to evaluate accuracy, feasibility, reproducibility, and training effect of ARFI for liver fibrosis evaluation. Methods: One hundred and one patients with chronic liver disease had LSE by Fibroscan and ARFI. LSE by ARFI was performed in the two liver lobes by two operators: an expert and a novice. Correlation and agreement were evaluated by the Pearson ( $R_p$ ) and intraclass ( $R_{ic}$ ) correlation coefficients. The independent reference for liver fibrosis was fibrosis blood tests. Results: ARFI results, ranging from 0.7 to 4.6 m/s, were well correlated with Fibroscan results ( $R_p=0.76$ ). Fibroscan had a significantly higher area under the receiver operating characteristic curve (AUROC) than ARFI for the perprotocol diagnosis of significant fibrosis:  $0.890\pm 0.034$  versus  $0.795\pm 0.047$  ( $P=0.04$ ). However, LSE failure occurred in zero patients using ARFI versus six patients using Fibroscan ( $P=0.03$ ). Thus, on an intention-to-diagnose basis, Fibroscan and ARFI AUROCs for the diagnosis of significant fibrosis were not different:  $0.791\pm 0.049$  versus  $0.793\pm 0.046$  ( $P=0.98$ ). Interobserver agreement was very good ( $R_{ic}=0.84$ ) and excellent for ARFI interquartile range ( $IQR\leq 0.30$ ) ( $R_{ic}=0.91$ ). Indeed, agreement was independently predicted only by ARFI IQR, but not by LSE result as earlier observed for Fibroscan. ARFI AUROC was  $0.876\pm 0.057$  in patients with ARFI IQR ratio  $\leq 0.30$ , and Fibroscan AUROC was  $0.912\pm 0.034$  in patients with Fibroscan IQR ratio less than 0.21 ( $P=0.59$ ). Intersite ARFI agreement between the two liver lobes was fair ( $R_{ic}=0.60$ ). There was no training effect for LSE by ARFI. Conclusion: ARFI is highly feasible and reproducible, and provides diagnostic accuracy similar to Fibroscan. This new device seems noteworthy for the widespread noninvasive diagnosis of liver fibrosis.

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