(Emax) and A waves (Amax), E wave deceleration time (DT) and pressure half time (PHT) of E wave.

Results We found out altered RV diastolic filling parameters in the 44 obese patients at the start of treatment, with a significant improvement at 1 year. Emax was decreased at the start but higher at the end of study (44.6 ± 6.6, versus 56.6 ± 8.8 cm/sec), while A max decreased significantly at the end of study (50.4 ± 10.2 versus 44.6 ± 12.4 cm/sec). E wave PHT prolonged at the start, was significantly shorter at the end of study (66.24 ± 8.22 versus 60.44 ± 14.22 msec.) and also E wave DT (244.6 ± 26.6 versus 198.4 ± 30.2). In patients with a longer history of obesity and associated OSA, RV diastolic parameters were more severely impaired and also the response to treatment was less pronounced, compared to patients with a recent onset.

Conclusion In obese patients with obstructive sleep apnea, the altered RV diastolic parameters can be significantly improved at one year, by continuous positive airways pressure ventilation and weight control.

Disclosure of interest The authors have not supplied their declaration of competing of interest

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Poster n°25

Clinical evaluation of wall shear stress by ultrafast vector flow imaging in carotid atherosclerotic stenosis

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Introduction Carotid plaque vulnerability assessment is an important factor in guiding the decision to perform carotid endarterectomy in case of asymptomatic stenosis. Ultrafast Ultrasound Imaging (UUI) offers the possibility of evaluating local flow velocities over an entire 2D image, allowing access to measure the wall shear stress (WSS). Our objective was to evaluate the feasibility of WSS measurement in a prospective series of patients with carotid stenosis.

Method We used a linear probe (7.5 MHz, SuperSonic Imagine©). UUIacquisitions last 600 ms with 3 tilted plane waves for an effective frame rate of 5000 Hz. We evaluated the flow velocity in 5 areas of the carotid wall: common carotid artery (1), plaque ascent (2), peak (3), descent (4), and internal carotid artery (5) (Figure 1). WSS was computed with the vector field speed. Shear stress measurement method was validated using a laminar flow phantom with laminar flow.

Results Good correlation was found between in vitro measurement and the theoretical WSS values ($R2 = 0.95$; $P < 0.001$). 25 patients were included (mean age: 72 ± 5 years), with a mean percentage of stenosis of 75 ± 12% (NASCET). The maximum WSS value over one cardiac cycle follows the shape of the plaque with a progressive increase to a maximum value at the peak (2.12 ± 1.27 Pa). The post-stenotic descent zone has the lowest shear stress (0.57 ± 0.39 Pa), lower than the WSS values in the healthy zone (1.02 ± 0.36 Pa for the common carotid and 0.68 ± 0.39 Pa for the internal carotid artery) (Figure 1).

Conclusion This method allowed the local and direct evaluation of the plaque's wall shear stress. Unlike the global evaluation of speed using conventional Doppler, these measurements make it possible to better characterize the haemodynamic conditions to better identify areas of vulnerability.

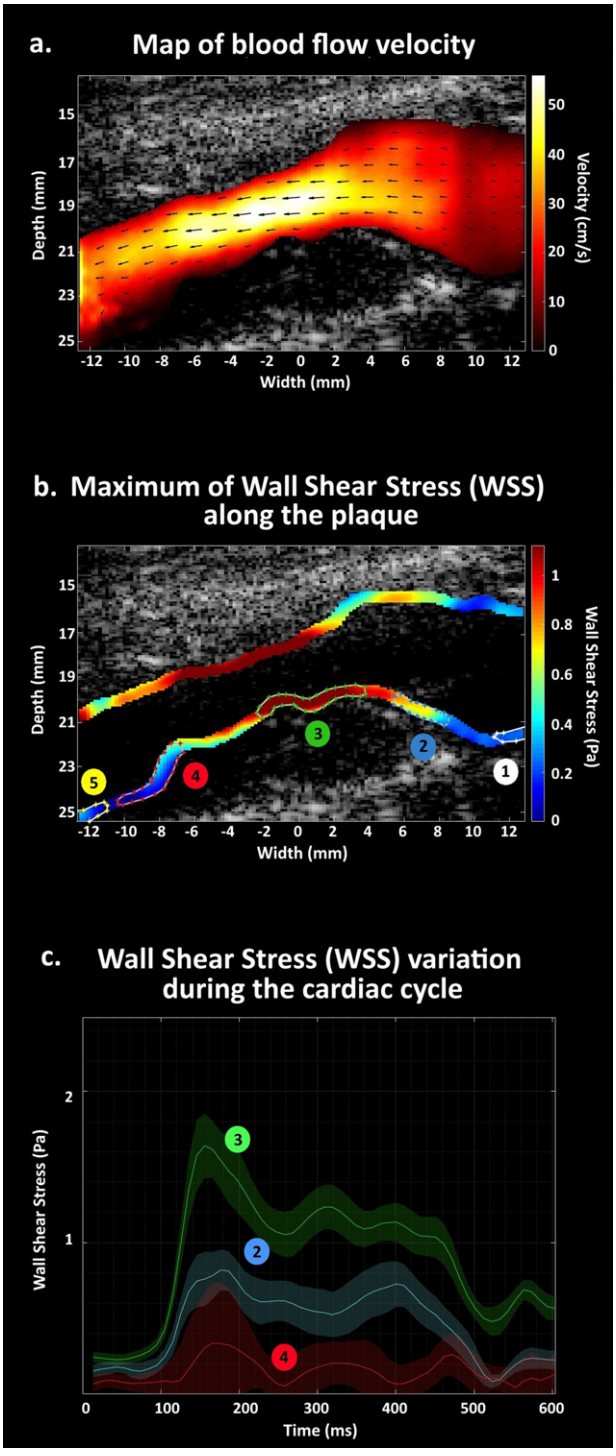

Figure 1

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