

Can Doppler Predict The Preservation of Erectile Function in High Intensity Focused Ultrasound treatment of Localised Prostate Cancer? – A Preliminary Study

Ivan M Hoh¹, Tom Leslie², JGCalleary¹, M Emberton¹, C Allen¹

¹University College London Hospitals ²Churchill Hospital, Oxford, UK

Abstract - Presented at ISTUCongress in Boston October 2005

Recent interest in HIFU has come from men who are anxious to preserve erectile function whilst achieving cure from prostate cancer. One of the advantage of Sonablate®500 lie in the integration of real time B-mode monitoring during treatment, thus allowing a more precise energy delivery without destroying the neurovascular bundle(NVB) vital for sustaining erection. Four studies reported rates of impotence after HIFU between 24% (75/315) and 100% (62/62) but the proportion of men who were potent before treatment was inadequately reported. In this pilot study, we used TRUS power Doppler to predict sexual function before and after HIFU by evaluating Doppler signals from neurovascular bundles.

Methods TRUS assessment of the prostate was performed by a single uro-radiologist before and after HIFU using the 5-10MHz endorectal probe (Acuson Sequoia). Pulsed wave, colour and power Doppler were used to assess flow velocity, resistance and pulsatility index in the neurovascular bundle before HIFU and after HIFU within 24 hours, 2 weeks and 6 weeks. Sexual function was determined using the IIEF questionnaire before HIFU and 6 weeks later.

Results All patients (n=5; average age=53.6years (47-63)) had normal blood flow within the NVBs and has a normal erections before HIFU. Within 24 hours post-HIFU, TRUS Power Doppler demonstrated the preservation of flow within both NVBs in all patients. All patients reported a return of erection as soon as 3 days post-HIFU. None required any pharmacological or mechanical assistance for impotence.

	Before HIFU	0-24hours post	2weeks post
Mean Resistance Index	0.87 +/-0.13	0.85 +/- 0.17	0.9 +/- 0.09

Conclusions TRUS Doppler may provide an accurate method of assessing outcome in terms of erectile function. It correlated well with patient’s feedback and IIEF. Since the NVBs are not readily seen on MRI, TRUS provided a useful initial feedback to the clinician which is relatively cheap, quick and repeatable. In addition, these preliminary results demonstrate the potential of preserving erection by incorporating Doppler to the existent B-mode imaging so that the NVB’s can be visualised in realtime, thus enabling the operator to adjust the treatment planning accordingly. This is part of an ongoing study evaluating HIFU treatment using Sonablate®500 on early prostate cancer.