Quantitative transrectal shear wave elastography undergoing salvage extraperitoneal laparoscopic radical prostatectomy following failed radiotherapy

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Abstract

The feasibility phase of this study is a part of a large Shear Prostate Study aimed at diagnostic accuracy of Transrectal SWE in the detection and characterisation of prostate cancer. The study design is shown in Figure 1 below:

Methods and materials

Overall sensitivity and specificity of SWE in the detection of prostate cancer for various sizes of the lesions was 0.77 (95% CI 0.627 - 0.880) and 0.82 (95% CI 0.642 - 0.942) respectively. The diagnostic accuracy increased with increasing size of the lesions with overall AUC of 0.89. There were 48 cancer foci identified on final histopathology using patient specific mold based approach (Table 1 below). Mean number of lesion was 3.4 (range 2 to 4).

Results

Table 2 shows comparison of performance of quantitative shear wave elastography and MRI (anatomical sequences and DWI) for different sizes of the lesions based on histopathology of radical prostatectomy as reference standard. The performance of MRI and SWE was comparable and both were poor in smaller (<5mm). In three patients SWE correctly identified extracapsular extension of cancer and none of these were reported on MRI. There were not many lesions in the anterior zone of the prostate and hence performance of both imaging modalities in this area would need further study.

Discussion

Transrectal SWE imaging significantly improves detection and characterisation of radioresistant prostate cancer after radical external beam radiotherapy. The SWE technology can quantitatively assess the disease which may help in the differentiation to different imaging treatment options. A particularly promising role of this technology is the assessment of the apical area is emerging to guide surgery with aim to reduce positive surgical margins, however this needs future studies with larger number of patients.

References

