

DETECTION OF PROSTATE CANCER WITH HISTOSCANNING™

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INTRODUCTION AND OBJECTIVES: HistoScanning™ is a tissue differentiation, visualization and quantification tool which identifies changes to solid organ tissues. It uses native ultrasound in order to predict and visualise prostate carcinoma. HistoScanning uses a specific three dimension transrectal ultrasound device to acquire and transmit data to the HistoScanning program. The data are differentiated and suspicious areas in the prostate are localised and spotted in 3D. Our objective was to compare HistoScanning with histopathology of radical prostate specimens and to determine the HistoScanning sensitivity regarding to cancer volume and localization.

MATERIAL AND METHODS: From October 2009 until April 2010, 68 patients underwent a radical prostatectomy for clinically organ confined prostate cancer. HistoScanning was performed one day preoperatively in 52 of them. 90% underwent ≥ 2 scans in order to exclude artefacts; the scan with the largest suspicious volume(s) was used for evaluation. Suspicious lesions measured $\geq 0,2$ ml were considered positive. All prostatectomy specimens were processed according to the Stanford protocol and evaluated by an experienced uro-pathologist (RKC). The prostate specimen was divided into a grid of 9 different areas. HistoScanning findings were correlated with final pathology of the radical prostatectomy specimens regarding to localisation and volume. A match was defined as a HistoScanning positive lesion in a correspondent histopathologically positive area. The results were analysed regarding to pT-stadium, Gleason Score, PSA, tumour volume and volume of HistoScanning-lesions.

RESULTS: Mean patient age was 63,6 (40-75) years, mean PSA was 8,97 (2,2-41,2) ng/ml, mean prostate volume was 45,4 (22-100) ml and mean tumour volume was 4,1 (0,35-22,8) ml. 27 (52%) patients had a pT2 tumour, 25 (48%) had a pT3 carcinoma. 4 (8%) patients had a salvage prostatectomy. 6 (11,5%) patients had a final Gleason Score (GS) 6, 34 (65%) and 8 (15%) patients had GS 7 and GS ≥ 8 respectively. HistoScanning had 75% sensitivity for detecting and locating prostate carcinoma. 64% of these cases showed a good correlation for tumour volume. The results were identical for normal and salvage prostatectomy. The sensitivity was higher for pT3 tumours (92%) than for pT2 tumours (59%). HistoScanning detected 50% of the GS 6 tumours, 74% of GS 7 and 100% of GS ≥ 8 . The preoperative PSA had no statistical significance. HistoScanning detected small (17/52) tumours (<1 ml) in 60%, intermediate (24/52) tumours (1-5ml) and large (11/52) tumours (>5ml) in 87 and 82%, respectively. Identical findings are seen regarding to the volume of suspicious HistoScanning lesions. For small (17/52) ($\leq 0,5$ ml), intermediate (22/52) (0,5-2ml) and large (13/52) (>2ml) lesions, HistoScanning correctly predicted prostate carcinoma localisation in 53%, 86% and 85%, respectively.

CONCLUSION: HistoScanning seems to have a great potential in the detection of significant prostate cancer. In particular, extracapsular, poor differentiated and large prostate cancers show a high detection rate. However, larger prospective studies are needed to verify these preliminary results.



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