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Ex vivo fluorescence confocal microscopy: the first application for real-time pathological examination of prostatic tissue.

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ABSTRACT

OBJECTIVE: To report the first application of ex vivo fluorescence confocal microscopy (FCM) - a novel optical technology that is capable of providing fast microscopic imaging of unfixed tissue specimens- in the urological field assessing its diagnostic accuracy for non neoplastic and cancerous prostate tissue (prostatic adenocarcinoma) compared to the 'gold standard' histopathological diagnoses. PATIENTS AND METHODS: In all, 89 specimens from 13 patients with clinically localised prostate cancer were enrolled into the study. All patients underwent robot-assisted laparoscopic radical prostatectomy with fresh prostatic tissue biopsies taken at the end of each intervention using an 18-G biopsy punch. Specimens were randomly assigned to the three collaborating pathologists for evaluation. Intra- and inter-observer agreement was tested by the means of Cohen's ?. The diagnostic performance was evaluated on receiver operating characteristic curve analysis. RESULTS: The overall diagnostic agreement between FCM and histopathological diagnoses was substantial with a 91% correct diagnosis (? = 0.75) and an area under the curve of 0.884 (95% confidence interval 0.840-0.920), 83.33% sensitivity, and 93.53% specificity. CONCLUSION: FCM seems to be a promising tool for enhanced specimens' reporting performance, given its simple application and very rapid microscopic image generation (<5 min/specimen). This technique may potentially be used for intraoperative pathological specimens' analysis. © 2019 BJU International Published by John Wiley & Sons Ltd. KEYWORDS: RALP ; #PCSM; #Prostate cancer; digital pathology; fluorescence confocal microscopy PMID:30908852 DOI:10.1111/bju.14754