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### Digital Frozen Sections with Fluorescence Confocal Microscopy During Robot-assisted Radical Prostatectomy: Surgical Technique

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#### ABSTRACT

**Background:** Robot-assisted radical prostatectomy (RARP) involves a tradeoff between oncological control and functional outcomes. Intraoperative control of surgical margins (SMs) may help in ensuring the safety of the dissection. Fluorescence confocal microscopy (FCM) is an effective method for interpretation of prostate tissue and provides digital images with an appearance similar to hematoxylin-eosin staining. **Objective:** To describe an alternative technique to NeuroSAFE for intraoperative evaluation of neurovascular-adjacent margins shaved from ex vivo specimens using FCM analysis. **Design, setting, and participants:** This was a prospective study of 24 patients undergoing RARP with intraoperative FCM control of margin status. **Surgical procedure:** After surgical dissection, SMs are sectioned from the fresh prostate using the Mohs technique (shaving): three slices from the apex and the right and left posterolateral aspects are obtained. Digital images of the shavings are immediately acquired via FCM and shared with a remote pathologist. In the case of a positive SM, a focal secondary resection of the bundle can be performed owing to the ability of FCM to locate a region of interest on the flat sample. **Measurements:** The primary outcome measure was the rate of negative margins at neurovascular-adjacent sites. Oncological and functional outcomes for patients with 1 yr of follow-up are also reported. **Results and limitations:** All patients had negative SMs in shavings from neurovascular-adjacent areas at final histopathology; four underwent a secondary resection with final conversion to negative SM status. Nine of ten patients with 1-yr follow-up are free of biochemical recurrence (prostate-specific antigen persistence in one pN1 case), nine are fully continent, and four of the five with preoperative potency have recovered their sexual function. **Conclusions:** Digital frozen sections with FCM during RARP may represent an alternative to NeuroSAFE for possible optimization of functional outcomes without compromising oncological safety. **Patient summary:** We developed a technique to ensure complete removal of cancer tissue during surgical removal of the prostate. Tissue specimens are examined via digital microscopy in real time during the operation. This allows the surgeon to remove more tissue if cancer is detected at the margins of a specimen, while avoiding unnecessary removal of healthy tissue. **Keywords:** Digitalization; Fluorescence confocal microscopy; Frozen section; Prostate cancer; Robot-assisted radical prostatectomy; Secondary resection; Surgical margin control; Telemedicine. Copyright © 2021 European Association of Urology. Published by Elsevier B.V. All rights reserved. PMID: 33965288 DOI: 10.1016/j.eururo.2021.03.021