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"Real-time" Assessment of Surgical Margins During Radical Prostatectomy: State-of-the-Art.

Eissa A, Zoeir A, Sighinolfi MC, Puliatti S, Bevilacqua L, Del Prete C, Bertoni L, Azzoni P, Reggiani Bonetti L, Micali S, Bianchi G, Rocco B. *Clin Genitourin Cancer*. 2019 Jul 19. pii: S1558-7673(19)30228-9. doi: 10.1016/j.clgc.2019.07.012.

ABSTRACT

Histopathologic examination of the pathologic specimens using hematoxylin & eosin stains represents the backbone of the modern pathology. It is time-consuming; thus, "real-time" assessment of prostatic and periprostatic tissue has gained special interest in the diagnosis and management of prostate cancer. The current study focuses on the review of the different available techniques for "real-time" evaluation of surgical margins during radical prostatectomy (RP). We performed a comprehensive search of the Medline database to identify all the articles discussing "real-time" or intraoperative assessment of surgical margins during RP. Several filters were applied to the search to include only English articles performed on human subjects and published between January 2000 and March 2019. The search revealed several options for pathologic assessment of surgical margins including intraoperative frozen sections, confocal laser endomicroscopy, optical spectroscopy, photodynamic diagnosis, optical coherence tomography, multiphoton microscopy, structured illumination microscopy, 3D augmented reality, and ex vivo fluorescence confocal microscope. Frozen section represents the gold standard technique for real-time pathologic examinations of surgical margins during RP; however, several other options showed promising results in the initial clinical trials, and considering the rapid development in the field of molecular and cellular imaging, some of these options may serve as an alternative to frozen section. Copyright © 2019. Published by Elsevier Inc. KEYWORDS: Confocal microscopy; Extra-prostatic extension; Frozen section; Pathologic examination; Prostate cancer PMID: 31784282 DOI: 10.1016/j.clgc.2019.07.012