

Letter to the editor

Interventional pathologist and intraoperative surgical margin evaluation of radical prostatectomy specimens ex-vivo confocal microscopy vs. frozen section evaluation

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Dear Editor,

We read with interest the contribution by Sofia Asioli et al. on Interventional Pathologists (IPs) and real-time histological evaluation in surgical and outpatient settings based on ex-vivo confocal microscopy (CFM) ¹. The authors review clinical applications in various fields, such as neurosurgery, dermatology and breast pathology, with some reference to prostate pathology, showing the benefits of such technology.

Our interest in the contribution by Asioli et al. is related to the adoption of CFM coupled with the involvement of IPs in the intraoperative evaluation of surgical margins of fresh radical prostatectomy specimens (RPSs). Prof. B. Rocco and his team ² introduced us to such a topic. It is called *en-face* margin evaluation: an entire surface area of the so-called capsule of the RPS is inspected with a CFM vs. the boundary between the prostate parenchyma and the so-called inked capsule at ~ 5 mm intervals in the conventional intraoperative frozen section analysis (IFS) (including the NeuroSAFE technique) ³.

There are two *en-face* margin types of examinations ⁴⁻⁶: *en-face* shaving of posterolateral margins (Mohs technique) and *en-face* scanning of posterolateral margins of intact RPSs (LaserSAFE analysis). With the former a slice of capsular area (i.e. surface parenchyma) clinically suspicious for being positive is removed. The part of the prostate slice corresponding to the external surface is scanned. With the *en-face* scanning of posterolateral margins of intact RPSs, the specimens are not sliced, and not even inked at the surface level. The fresh specimen is positioned on the CFM; first the entire posterior part is scanned and then the lateral parts are scanned for the presence of malignant glands at the surface level ⁴.

In our opinion, there are attractive points linked to IP and CFM ³⁻⁶ in com-

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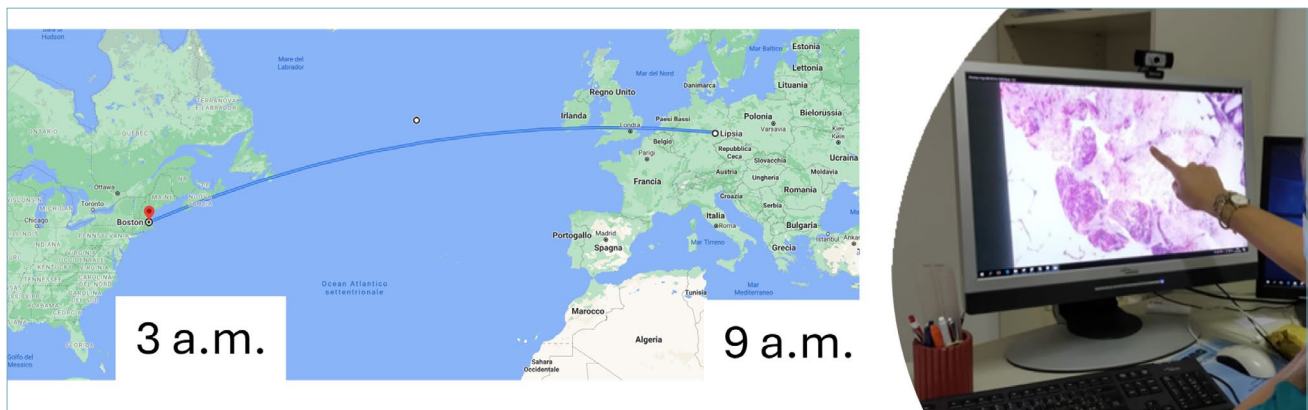


Figure 1. A remote pathologist provides instantaneous reporting. In the image the reporting pathologist is in the US whereas the surgical intervention is in Europe.

parison with IFS. It is an imaging technology capable of scanning fresh tissue of the whole surface area of the specimen for the presence of tumor cells and to produce digital images. With IFS the specimen is cut at an interval of 4-5 mm, the risk is that tumors at margin measuring < 4-5 mm can be missed, whereas tumors > 5 mm are more likely to be detected⁷. The technique is significantly faster than IFS (< 10 min vs. ~60 min), wide objectives producing high-resolution cellular-level detail of fresh surgical specimens. The principal surgeon or a member of the surgical team can prepare and image the specimen within the operating room or adjacent room with a CFM, which is particularly valuable when areas of concern have been identified through surgeon suspicion or preoperative imaging techniques. This is followed by digital transfer of images: a remote pathologist provides real-time reporting (Fig. 1). CFM is linked to the ability to maintain tissue integrity. With IFS the tissue is first frozen and then defrosted and fixed with formalin and embedded in paraffin, the final hematoxylin-eosin tissue sections show a certain degree of artifacts. There is an almost perfect κ -agreement (0.86) between CFM and formalin-fixed paraffin-embedded RPSs⁴⁻⁶.

The next frontier in intraoperative surgical margin evaluation could be CFM-based whole mount 3 to 4 mm thick slice examination of RPSs, as we have seen in a preliminary report⁸. This represents a completely new approach in processing RPSs, based on the use of a CFM and tissue slices for both margin and tumor evaluation. "This intraoperative approach could replace the traditional laborious and costly processing of RPSs based on large cassettes or regular cassettes"⁸.

In conclusion, our interest in the paper by Asioli et al.¹ is linked to the role of IPs fully integrated in diagnostic processes, interacting and collaborating directly and in real time with clinicians and patients.

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