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Prostate Cancer

Frozen Section for the Management of Intraoperatively Detected Palpable Tumor Lesions During Nerve-Sparing Scheduled Radical Prostatectomy

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Abstract

Objectives: The intraoperative finding of palpable tumor lesions has been described as a contraindication for nerve-sparing (NS) radical prostatectomy (RP). However, its evaluation is subjective. Especially in patients with a strong demand to regain postoperative erectile function, a surgeon might be reluctant to sacrifice neurovascular bundles (NVBs) based on this information. We investigated the use of frozen section (FS) analysis to monitor the safety and efficiency of NS during RP in patients with intraoperatively identified subcapsular tumor lesions.
Methods: In 83 of 608 patients, who underwent NS-RP, intraoperative FS was performed because of a lesion palpable close to the capsule. A wedge of 4 cm in diameter including the lesion was cut off and stained differently for capsule and intraprostatic margin. In case of presence of carcinoma adherent to the capsule, the NVB was resected; otherwise, the NVB remained in situ.
Results: Patients with palpable tumor lesions had pT3 tumors in 36% and 61% had Gleason 4 pattern, compared to 18% and 42% for the control group. Carcinoma was found in 93% of the FS specimens. In 42% of the FS samples, tumor had contact with the capsule and 14% of secondary resected NVB specimens demonstrated a carcinoma invasion. In 52% NVBs could be preserved despite an ipsilateral nodule without negatively affecting the margin status. However, the false-negative rate of the FSs was 6%. Conversely, FSs set the intraoperative decision to remove the NVB in 42% of FS patients, resulting in an additional 36% of negative margins.
Conclusions: In patients with intraoperatively detected tumor lesions during a NS planned RP, FS objectively supports the decision of secondary NVB resection as well as preservation.

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1. Introduction

Nerve-sparing radical prostatectomy (NS-RP), as introduced by Walsh et al. [1], marks the state-of-the-art therapy especially for younger and potent patients with localized prostate cancer [2].

With reported incontinence rates <10% [3,4] and potency rates up to 96% [5–7], the specific major comorbidities of this procedure have become a predictable risk. To ensure the oncologic safety of the procedure, several models have been developed to identify patients with pathologically organ-confined carcinoma, who are therefore eligible for a NS procedure [8–10]. Most of these models are based on clinical stage, prostate-specific antigen (PSA) levels, and various analyses of transrectal biopsies.

Nevertheless, some authors consider intraoperative findings, such as ipsilateral palpable tumor nodules or adhesions, as a contraindication for ipsilateral nerve preservation [11,12]. Due to the fact that these findings are of a particular subjective nature and also can be the results of benign processes, a surgeon might be reluctant to sacrifice a preserved neurovascular bundle (NVB) based on these results. Evidently NS is an important issue in postoperative quality of life, inasmuch as some patients might even be willing to risk a trade off for their sexual function [13,14]. On the other hand, with respect to an oncologically safe procedure, every surgeon attempts to avoid positive surgical margins, which are reported to increase the risk of disease recurrence [15].

Although preoperative risk assessment has proven to be useful to plan NS in RP, a palpable tumor lesion detected during surgery might demand reconsideration. An objective instrument to determine the further procedure is therefore obviously needed.

As a tool to increase the rate of patients undergoing bilateral NS surgery while maintaining tumor-free surgical margins, Cangiano et al. [16] and later Goharderakhshan et al. [17] described the utility of intraoperative frozen section (FS) to monitor the safety of NS-RP. For the specific finding of a palpable tumor lesion detected during NS-RP we here report a single surgeon's experience with intraoperative FS.

2. Methods

From May 2002 to May 2004, 608 NS-RPs were performed by a single surgeon (H.H.) applying the previously described technique [18]. Based on a validated computerized algorithm including information from transrectal ultrasonography, PSA values, number of positive biopsies, in general, and biopsies with single Gleason grade 4/5 separately for each prostatic lobe were used for the decision to perform a unilateral or bilateral NS-RP [8].

Intraoperatively, in patients scheduled for a NS procedure, an inspection of the complete specimen for a palpable tumor anywhere close to the surface was performed by the surgeon directly after the prostate was removed. In case of a positive finding, a tangential disc of about 3–4 cm in diameter, including the suspicious area, was cut off and stained with different ink colors for capsule and intraprostatic margin (Figs. 1 and 2).

This specimen was immediately sent to our Department of Pathology, where three to four incisions perpendicular to the color-marked surfaces were performed. Before rapid hematoxylin and eosin staining, these three or four "blocks" were completely frozen and finally progressed by 3–5-mm step section to 5–10 sections per FS specimen.

Simultaneously, the procedure continued until the suture placement for the vesicourethral anastomosis was completed.

In case of a focal or wide contact of tumor with the inked capsule, corresponding soft tissue as well as the ipsilateral NVB were resected and collected as a separate specimen for final pathologic examination. Accordingly, with no tumor contact on the outer stained margin or no tumor detection in the FS specimen at all, the NVB was saved and the procedure finished in the usual manner.

The remaining specimens were inked with three different colors to differentiate left and right prostatic capsule (green and blue) as well as the area corresponding to the FS sector (yellow).

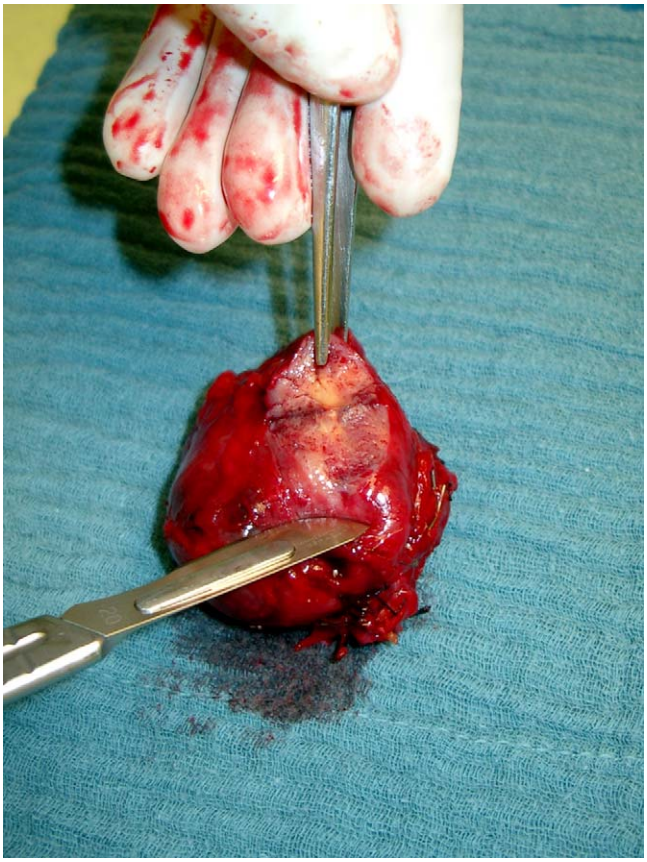

Fig. 1 – Tangential incision at the area of a palpable lesion.

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