

## Review

# Intraoperative Frozen Section Diagnosis in Urological Oncology<sup>☆</sup>

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## Abstract

The intraoperative frozen sections are indicated if the pathological findings change the surgical procedure. In urological oncology is not recommended, as a general attitude, in the tumor diagnosis/staging during the surgery. The assessment of the surgical margins is recommended in partial surgical resections but the literature discourages its systematic use in the radical surgical resections. The assessment of the lymph nodes is specially indicated in the penile cancer with intermediate or high risk and non-palpable nodes, and is debated its utility in non-palpable lymph nodes of cystectomies and prostatectomies.

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## 1. Introduction

The performance of a pathologic study during surgery determines fast diagnostic decision making that is consequential upon the operation itself. Therefore, the pathologists should be solidly trained in their specialty and should also be acquainted with the surgical procedure, i.e. which technique is being used, what the surgeon wishes at the time of biopsy.

The types of intraoperative frozen sections (IFS) are quite varied. Sometimes just a small fragment of the lesion is available, and in this case the fragment is studied in its entirety. In other occasions the whole of the specimen is received and in this case it is the pathologist who chooses the most representative area

in order to answer the surgeon's question. In general surgical pathology, 9.5% of errors are due to poor sampling [1], a clear-cut communication between the surgery and the pathology departments may minimize this kind of error.

The intrinsic characteristics of the technique (tissue freezing) is the cause that some pathologies, in which cell details should be subtler, are more harmed than other, as is the case with lymphomas [1].

On the other hand, with fewer sections of the specimen the ability to go in depth into the selected tissue is also diminished—approximately one-fourth of the underdiagnoses have such origin [1].

In spite of all of the above, the misdiagnosis index by IFS that is significant for the patient is very low and also dependent upon the expectations placed on such diagnosis because it is more precarious than post-operative diagnosis. For this reason the surgeon should be aware of the most precise indications and also of its limitations. The object of this review is to reflect the status of the issue in urologic oncology.

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## 2. Handling of intraoperative frozen section specimens

All specimens sent for IFS should be fresh and contain no fixative. If the specimen is small (1–2 cm) and to avoid dehydrate during transportation, it is advisable to cover it with a gauze moistened with physiological saline; it is contraindicated to place the specimen floating in saline because the freezing process would be hindered due to the great hydric imbibition of the tissues.

The urologist should indicate any specific requirements by means of signs on the specimen; however, close communication between urologists and pathologists should be the rule at all times.

The frozen sections are stained by fast methods, and the remaining tissue is processed exactly like any other sample.

In some cases the intraoperative cytology (imprints, scrapings or aspirates) can be useful with a good correlation with the standard frozen section [2].

## 3. Intraoperative frozen section in kidney tumors

### 3.1. Diagnosis of a renal mass

Even though 16.9% of the renal masses excised are not carcinomas, only 13% of them are pathologies of dubious surgical treatment (complex cysts or pseudo-tumoral inflammatory pathologies). The rest are benign tumors, and exceptionally sarcomas or metastases whose removal is often justified [3].

The cost-effectiveness of determining the nature of an uncertain renal mass during surgery is controversial, since as high as 20%–37% of false negatives have been reported [4], with quite variable false positive figures oscillating from practically nil [5] to 34% [4].

The causes of the false negatives can be multiple: a specimen not distinctive due to being too superficial and not having reached the tumor itself; the absence of a feasible neoplasia (necrosis or fibrosis); the cystic nature of the mass [6], and the problems encountered when trying to preserve the typical cytoarchitecture of most of the carcinomas as frozen section (Fig. 1). The origin of false positives may be due to the overvaluation of crushed tubules mimicking tumor [7], as well as the intrinsic limitations of the freezing method, that do not enable to precisely identify the size of the nucleus.

It does not seem, therefore, suitable to consider IFS a good method. Only in those cases in which the urologist needs to distinguish an urothelial carcinoma with renal parenchyma invasion from a renal cell

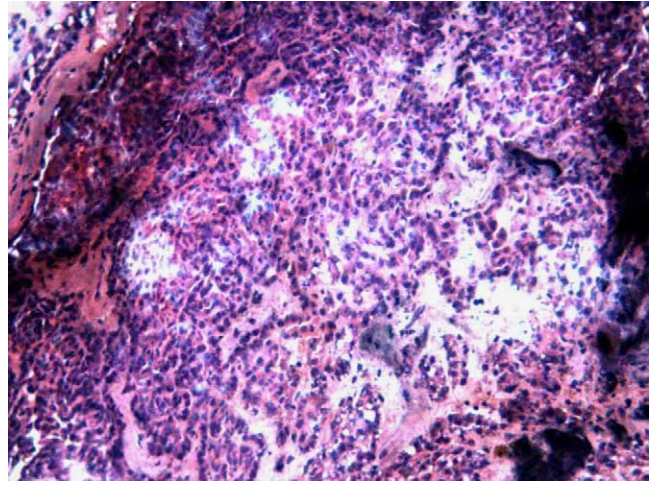


Fig. 1. Frozen section from a renal cell carcinoma. The crushed cells difficult the correct evaluation.

carcinoma with urinary tract extension, macroscopic and microscopic examination of the complete nephrectomy specimen (and not just a small sample of the tumor) will enable the pathologist to identify the origin of the neof ormation rapidly.

### 3.2. Assessment of the surgical margins in nephron-sparing surgery

IFS is much more useful for determining the status of the surgical margins in nephron-sparing surgery. Even though the usual cause of local recurrence following partial renal surgery is subclinical multifocality (which in turn is associated with the cellular subtype) [8], we should not disregard the risk contributed by an affected surgical margin, that may be related to the correlation existing between recurrences and the size and the degree of differentiation of the tumor [9].

The pathologist may receive two different kinds of specimens: small fragments selected by the urologist from which he/she considers suspicious areas, or else the whole specimen of a partial nephrectomy. The second alternative is advisable to avoid the crushed tissues that the small samples might contain. The complete partial nephrectomy specimen should be externally inspected by the pathologist and its surgical margin should be inked [10] (Fig. 2), it should be sectioned at 5-mm intervals, and the relationship between the tumor and the inked area should be observed. If the surgical margin were clearly far from the tumor, it would not be necessary to perform a frozen section; if there were any doubt, the IFS should be carried out. The margin is considered positive if the tumor extends to the inked surface [10]. Invasion of the calyceal system of the pelvis without infiltration of the

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