

Beyond conventional forceps: suction biopsy and cryobiopsy in upper tract urothelial tumors

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Accurate histopathological assessment remains a key challenge in the endoscopic management of upper tract urothelial carcinoma (UTUC), as conventional ureteroscopic biopsies frequently yield small or crushed specimens that may limit reliable grading and staging [1]. Recent efforts have focused on developing alternative methods to improve tissue acquisition during endoscopic procedures.

One promising technique is endoscopic cryobiopsy, which allows tissue to adhere to a cryoprobe through rapid freezing and enables the extraction of larger and better-preserved specimens with fewer crushing artifacts compared with standard biopsy forceps. Early clinical experience suggests that this method is feasible in the upper urinary tract and may provide samples of higher diagnostic quality [2]. Łaszkiewicz et al. demonstrated that this technique enables the retrieval of relatively large, high-quality tissue samples, including the muscle layer, making them more suitable for histopathological evaluation than specimens obtained using forceps or basket biopsy. However, current limitations of this method include its applicability only in rigid ureteroscopy, as well as the relatively large diameter and rigidity of available cryoprobes, which can make specimen extraction

challenging. These limitations are expected to be addressed in the near future with the development of thinner and more flexible probes.

Another emerging concept is aspiration-based sampling, in which tumor fragments or tissue debris generated during endoscopic manipulation or laser ablation are collected via controlled suction. Such material may serve as an additional source for histopathological or molecular analysis, particularly in situations where conventional biopsy is technically difficult. Furthermore, the use of continuous suction during endoscopic management of UTUC may reduce tumor burden within the collecting system by removing cancer cells throughout the procedure [3, 4]. However, the limited clinical experience with this approach currently precludes reliable assessment of its oncological impact.

Recent developments in techniques such as flexible sheaths and suction-assisted RIRS are already influencing practice in endourological stone surgery. A similar evolution may occur in the management of UTUC in the near future.

Further prospective studies are warranted to determine whether these novel sampling techniques can improve diagnostic reliability and better guide

kidney-sparing treatment strategies in patients with UTUC.**CONFLICTS OF INTEREST**

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ETHICS APPROVAL STATEMENT

The ethical approval was not required.

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