En Bloc Resection of Bladder Tumors

using the HybridKnife®
The 4 working steps in en bloc resection using HybridKnife

01 Marking

Prior to elevation, the tumor is marked around in a circle with coagulation points, which also represent the later line of resection. The lateral safety margin to the border of the tumor is about 5–7 mm.

02 Elevation

Using the waterjet function, the tumor is elevated by injecting within the marked points. The separation medium accumulates in the submucosa and forms a safety margin to the muscularis. This reduces the risk of perforation during the following resection.
Incision/Dissection

The tumor is resected after cutting around it at the raised resection level. The modes DRY CUT® or ENDO CUT® Q provide a high-quality cut with optimal hemostasis. Repeating the elevation provides a good presentation of the cut level (beneath the tumor) and contributes towards achieving the desired R0 resection.

Post-coagulation

Vessels or seeping bleeding occurring during or after the resection can be coagulated with FORCED COAG®.
ESD with HybridKnife –
a technique is making its mark

The endoscopic submucosal dissection (ESD) is an internationally established technique for the treatment of early carcinomas in the gastrointestinal tract. ESD with HybridKnife is simple and safe, with a steep learning curve. The four work steps, marking, elevation, incision/dissection and coagulation, can be performed without an instrument change.

In this way, non-muscle-invasive tumors and early carcinomas can be resected en bloc with HybridKnife, and with a safe R0 resection border – both laterally and in the downward extension.

Studies by renowned users confirm that*:

☑ also tumors with a diameter of 20 mm and larger can be resected en bloc with HybridKnife
☑ this reduces the rate of recurrence
☑ the resection level is raised; the risk of perforation is reduced due to the submucosal elevation layer
☑ accurate histological assessment of the resectate is possible

THE ADVANTAGES OF ESD IN THE GASTROINTESTINAL TRACT (GIT)

The waterjet function for elevation of the lesion-bearing mucosa in endoscopy
Can the application advantages found in the GIT be transferred to urology?

Past experience with resection of tumors of the bladder using HybridKnife suggest this. Because, like the walls of the organs of the gastrointestinal tract, esophagus, stomach and intestine, the layers of the bladder have a similar structure: mucosa, submucosa and muscularis. The principle of elevation is the same, as also are the further individual steps of en bloc resection of a bladder carcinoma with HybridKnife.

The first hospitals have reported successful interventions on a small number of patients.** For this reason, the new resection method is to be compared with the conventional snare resection method in a wide, multicenter study. Particular attention will be paid to the en bloc resection. The resectates from both techniques will be compared with regard to their pathological evaluation, which has an influence on the further treatment. Also, initial estimates are expected of whether and what positive influence the new method has on the recurrence rate.

The following institutes are taking part in the multicenter study in Germany:

☑ University Hospital Tübingen, Department of Urology
☑ Medical Center of the University of Munich, Department of Urology
☑ University Hospital Regensburg, Department of Urology
☑ University Hospital Erlangen, Department of Urology
☑ Charité – University Hospital Berlin, Department of Urology
☑ Diakonie-Klinikum Stuttgart, Department of Urology
The method of choice until now: TUR-B with snare. Using the monopolar or bipolar technique.

METHOD-DEPENDENT RISK OF RECURRENCE

The conventional transurethral snare resection has up until now been the method of choice for minimally invasive removal and pathological diagnosis of bladder tumors. However, tumors with a diameter greater than 7 mm cannot be resected en bloc. The tumor must be fractionated, which contradicts current oncological recommendations. By cutting up the tumor, it is possible for tumor cells to be released, which can lead to regrowth of the tumor tissue. In addition, breaking up the tissue can make the pathological assessment of the tissue and an exact diagnosis difficult.

All of these criteria are suggestive of putting the gold standard to the test in a comparison with en bloc resection using HybridKnife.
En bloc resection of tumors of the bladder using HybridKnife

En bloc resection of bladder tumors. All individual steps are performed with HybridKnife and without changing instruments.

A NEW, PROMISING ALTERNATIVE?

The bladder tumor can be resected in one piece using the electro-surgery function of the HybridKnife instrument. By elevating the mucosa, the resection level is raised and the risk of perforation of the muscularis is reduced.

The en bloc technique permits a more accurate pathological evaluation after the resection. Complete removal of the tumor can be verified on the basis of a contiguous resection border in the healthy tissue. The prospective, randomized multicenter study will confirm whether the new method has advantages over the gold standard with respect to:

☑ improved pathological assessment
☑ ability to assess the tumor invasion (lateral and vertical extension of the tumor, R status)
☑ improved substaging of T1 tumors
☑ initial statements on recurrence and progression rates
The HybridKnife models

We recommend these probe types for use in the bladder:

I-Type: Versatile in use, high degree of freedom

T-Type: The model with the best properties for preparing and working under tension, very good coagulation properties

Setting recommendations

Marking
FORCED COAG, effect 2, 50 watts

Elevation
Effect 20–30

Incision/Dissection
DRY CUT®, effect 3-5, 70 watts
ENDO CUT® Q, effect 2, cutting duration 4, cutting interval 4

Coagulation
FORCED COAG, effect 2, 50 watts
The Urology Workstation

Resection of tumors of the bladder using HybridKnife. And further applications in the urology tract.

Based on the electrosurgery module VIO® 300 D with the additional modules Waterjet Surgery and Argon Plasma Coagulation, the VIO Urology Workstation is virtually an all-round specialist in the OR. You will find further applications in urology on our web site: erbe-med.com
References


Schumacher B. et al, Water-jet assisted endoscopic submucosal dissection (ESDH) in comparison to conventional ESD technique for treatment of early gastric cancer, Gastrointest Endosc 2012, DDW abstract accepted.

Neuhaus H. et al, First Clinical Trial of Endoscopic Submucosal Resection (ESD) of Early Gastric Neoplasia with a Water-Jet Hybridknife (ESDH), Gastrointest Endosc 2009; 69: AB259.

