

# The surgery workstation

## VIO® and ERBEJET® 2

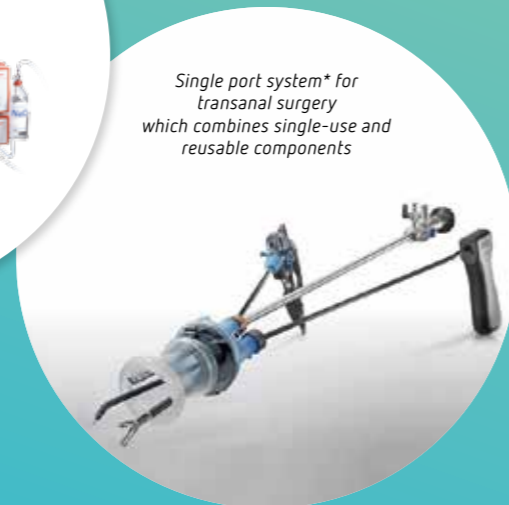
Based on the VIO® 3 electro-surgical unit with additional options for hydrosurgery and argon plasma coagulation, the VIO electro-surgery workstation offers expanded utility in the operating room. In addition to submucosal resection of rectal adenomas using the TEM ESD technique, you will find further surgical applications on our website based on clinical literature: [erbe-med.com](http://erbe-med.com)

## The benefits

- ✔ High-pressure needle-less mucosal elevation:
  - Mitigates the risk for perforation
  - Simplifies elevation even in challenging anatomy
  - Selective identification of tissue layers
  - Reduces risk of injury to vessels
- ✔ Targeted, precise staunching of bleeding
- ✔ Adjustable waterjet pressure
- ✔ Minimal bleeding during incision and dissection due to power dosage of the VIO technology



The rigid rectoscope\* for TEM



Single port system\* for transanal surgery which combines single-use and reusable components

## Experienced starting settings

### THE INSTRUMENTS

#### Waterjet applicator and monopolar needle electrode\*

During TEM ESD procedures the instruments for elevation and resection are used alternately.

#### Elevation

Effect 22

#### Incision

swiftCOAG®, effect 4, 120 watts

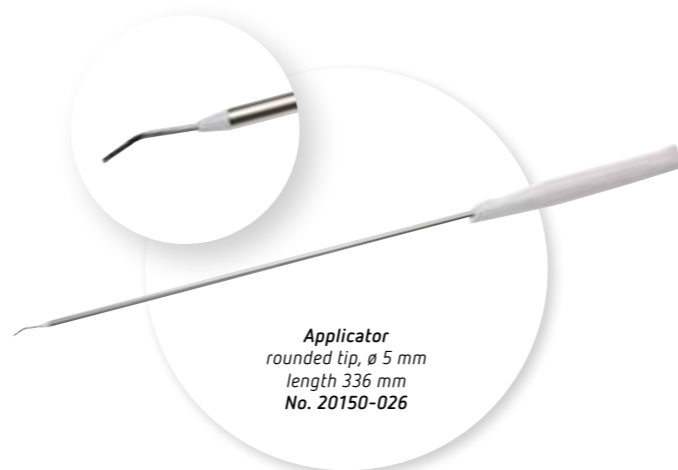
#### Dissection

swiftCOAG®, effect 4, 120 watts

#### Coagulation (when using bipolar forceps)

swiftCOAG®, effect 4, 120 watts  
(bipolar softCOAG®, effect 4, 50 watts)

\*not an Erbe product



Applicator rounded tip, ø 5 mm length 336 mm No. 20150-026

## References

- 1 Baral J, Hanna W, et al, *Transanal endoskopisch mikrochirurgische Exzision (TEM) von Rektumadenomen und T1-Karzinomen mittels Hydrojet unterstützter Submukosadisektion*, Z Gastroenterol 2010; 48 - P199DOI: 10.1055/s-0030-1263643
- 2 Baral J, et al, *The Waterjet Supported Submucosal Transanal Endoscopic Microsurgical Excision of Giant Rectal Adenomas (ESD - TEM)*, video presentation, ACS San Francisco 2011
- 3 Baral J, et al, *TEM-ESD: A new standard approach for large rectal adenomas*, Poster ASCRS 2015
- 4 Helmy S, Tutton M, *The use of TEM-ESD for massive rectal adenoma in a 23-hour day-case setting*, Colorectal Disease Volume 17, September 2015
- 5 Leijtens, JWA, *ESD-TEM: A new technique for large rectal adenomas combining endoscopic submucosal dissection and TEM with the hydrojet*, video presentation, NVGE October 2015
- 6 Heafner T, et al, *A critical review of the role of local excision in the treatment of early (T1 and T2) rectal tumors*, J Gastrointest Oncol 2014;5(5):345-352
- 7 Morino M, et al, *Transanal endoscopic microsurgery: what indications in 2013*, Gastroenterology Report 1 (2013) 75-84, doi:10.1093
- 8 De Graaf EJ, et al, *Transanal endoscopic microsurgery versus total mesorectal excision of T1 rectal adenocarcinomas with curative intention*, Eur J Surg Oncol. 2009 Dec;35(12):1280-5. doi: 10.1016/j.ejso.2009.05.001. Epub 2009 May 31
- 9 Hompes R, et al, *Completion surgery following transanal endoscopic microsurgery: assessment of quality and short- and long-term outcome*. Colorectal Dis. 2013; 15(10): e576-81.
- 10 Based on internal data, D029554

More data available on file.

We offer TEM courses in cooperation with Richard Wolf.

For more information go to:

[www.erbe-med.com](http://www.erbe-med.com) or [www.richard-wolf.com](http://www.richard-wolf.com)

Direct link to the webcast



## TEM ESD

Waterjet-assisted, rectal-wall-preserving procedure

**erbe**  
power your performance.

### Surgery workstation

01 VIO® 3 (Electrosurgery)

02 APC® 3 (Argon plasma coagulation)

03 ERBEJET® 2 (Hydrosurgery)

\*not an Erbe product

# EMR, ESD, TEM and TME

Procedural overview

	T0			T1			T2
	<1cm	1-2cm	>2cm	Polyp	sm1	sm2	sm3
EMR	████████████████████						
ESD			████████████████████	████████████████████	████████████████████	████████████████████	████████████████████
TEM				████████████████████	████████████████████	████████████████████	████████████████████
TME							████████████████████

Established procedures for respective tumor stages published in clinical literature

## EMR

Endoscopic mucosal resection (EMR) is a procedure for the en-bloc snare resection of polyps and adenomas up to 2 cm in diameter. Larger ones are removed using a piecemeal technique. Histological examination provides no proof of R0 resection in such cases. This leads to a considerably higher recurrence rate after EMR.

## ESD

The ESD procedure (endoscopic submucosal dissection) enables the flexible endoscopic en bloc resection of larger polyps in healthy tissue, even those exceeding 2 cm in diameter.

## TEM

Transanal endoscopic microsurgery (TEM) is a globally established technique for endorectal resection used to remove large, broad-based adenomas and T1 low-risk carcinomas using a full-thickness technique (mucosa, submucosa, muscularis propria, in part perirectal fat tissue).

## TME

T1 high-risk carcinomas are resected by performing total mesorectal excision (TME). The risk of locoregional recurrence is reduced through resection.<sup>8</sup>

# TEM ESD

## The benefits of waterjet-assisted TEM

Rectal-wall-preserving TEM ESD combines the advantages of transanal endoscopic microsurgery (TEM) and endoscopic submucosal dissection (ESD). Local tumor excision using rigid TEM instruments is performed with minimal access trauma via a rigid rectoscope or a flexible port. The pneumorectum provides an almost unrestricted view of the target area.

Elevation using the high-pressure waterjet in combination with chromoendoscopy offers the following advantages for TEM ESD:

- ✓ The liquid cushion elevates the resection area, ensuring a safe distance to the muscularis. The contrasting makes it easier to identify the resection layer and margins<sup>5,10</sup>
- ✓ The fluid increases conductivity and improves the cutting features of monopolar electroresection<sup>5</sup>

This makes TEM ESD a relatively quick method for resecting large-scale rectal adenomas with very low recurrence rates while minimizing complications.<sup>1,2,3</sup> Since the muscle layer remains intact, inflammatory reactions commonly associated with full-thickness TEM resection are minimized. As a result, continence-preserving procedures are possible more often after a TEM ESD as excision biopsy.<sup>3,4,8</sup>

Above mentioned data is based on publications of these centers:  
 - Dr. Matthew Tutton, Colchester General Hospital, UK  
 - Drs. Jeroen Leijtens, Laurentius Ziekenhuis Roermond, Netherlands  
 - Dr. Jörg Baral, Städtisches Klinikum Karlsruhe, Germany

For certain indications there is a proven reduction in the rate of recurrence for waterjet-assisted TEM ESD.<sup>2,3,5</sup> Unlike full-thickness TEM resection, this procedure requires no suturing of the resection bed. This can reduce operation times.

### TEM ESD COMPARED TO EMR/ESD

- ✓ Large, even intraperitoneal tumors can be resected with low morbidity<sup>2</sup>
- ✓ Bi-manual technique reduces operation times<sup>2</sup>
- ✓ High R0 resection rate<sup>2</sup>
- ✓ Lower complication rate<sup>2,3</sup>
- ✓ Partial or full-thickness resection possible at any time if necessary

### TEM ESD COMPARED TO TEM

- ✓ Lack of elevation indicates deeper infiltration (non-lifting sign)
- ✓ Muscle layer remains intact; the organ remains closed
- ✓ Possible later required surgery is not affected by preserving the compartment<sup>9</sup>
- ✓ Minimized inflammatory reactions in perirectal fat tissue<sup>4</sup>

*"The TEM ESD with use of waterjet and chromoendoscopy is a safe and efficient technique for the excision of large rectal adenomas, with a low complication rate and low local recurrence rate".*



Dr. Jörg Baral, Städtisches Klinikum Karlsruhe

# The surgical steps



## 01 Waterjet elevation

Needle-less high-pressure waterjet elevation creates a submucosal fluid cushion and lifts the tumor-bearing mucosa. Unlike the healthy surrounding mucosa, the adenoma does not change color during elevation using sodium chloride fluid with indigocarmine dye.<sup>10</sup> This makes it easy to identify the lesion.<sup>5</sup>

## 02 Incision and dissection

The mucosa is incised at a lateral safety margin from the adenoma, beginning aborally. Using the swiftCOAG mode, the submucosa can be optimally dissected; through elevation blood vessels are well exposed, temporarily compressed and selectively coagulated.

## 03 Elevation on demand

The fluid cushion can be replenished at any time to preserve its protective effect and definition of tissue layers throughout the course of resection.

## 04 Coagulation

Vessels are coagulated during resection using the swiftCOAG mode. The pathologist can make an optimal histological assessment of the en-bloc resected tissue.<sup>1,4</sup>