Hybrid technology in flexible endoscopy
In EMR, the hybrid technology also allows the resection of extensive lesions

ESD with the HybridKnife® is faster and easier compared to conventional ESD

Operative time in POEM is significantly shorter as exchange of instruments is unnecessary

In over 90% of Barrett’s patients, complete macroscopic resection can be achieved. The risk of stricture formation can be reduced to 2%
The waterjet provides expanded utility for electrosurgical procedures in flexible endoscopy. The layer-specific elevation creates a fluid cushion in the submucosa of the gastrointestinal tract which protects the adjacent tissue layers e.g. muscularis.

Numerous studies document the advantages of the hybrid technique in ESD (endoscopic submucosal dissection), EMR (endoscopic mucosal resection), POEM (peroral endoscopic myotomy) and the ablation of Barrett’s Esophagus – these application benefits are a direct result of the double function of electrosurgery and hydrosurgery with the HybridKnife® or HybridAPC.

Many renowned users are convinced of the clinical benefit our hybrid technology offers. This testimonial brochure captures their personal experiences with hybrid technology.
For over 20 years now, we have been using the principle of HF surgery based on automated cut coagulation (endoCUT\textsuperscript{®}) technology in interventional, flexible endoscopy. This has meanwhile become an indispensable part of every thermal tissue treatment. Further convincing improvement has been achieved with the VIO\textsuperscript{®} 3. In addition to the intuitive and adapted touchscreen operation, the significantly faster and more precise first cut in resection (endoCUT\textsuperscript{®} Q and I) are particularly impressive, as are the considerably more homogeneous tissue and ignition effects of the APC 3.
Instruments for hybrid techniques and waterjet elevation

01 HybridKnife®, T-Type, I-Jet
   No. 20150-060

02 HybridKnife®, I-Type, I-Jet
   No. 20150-061

03 HybridKnife®, O-Type, I-Jet
   No. 20150-062

04 HybridAPC
   No. 20150-015

05 Flexible Probe
   No. 20150-020

Gastroenterology workstation:
with units and modules for electrosurgery, plasma surgery, hydrosurgery and endoscopic irrigation
EMR with flexible waterjet probe

- The selective fluid cushion* in the submucosa simplifies EMR\textsuperscript{1,2a}
- This technique also allows the resection of extensive lesions\textsuperscript{1}
- The fluid collects selectively in the submucosa\textsuperscript{1}
- The resection speed is significantly faster with the elevation technique\textsuperscript{2} (0.776 cm\textsuperscript{2}/min vs 0.49 cm\textsuperscript{2}/min of the lesion)\textsuperscript{2}

\textsuperscript{2} Belle S, von Boscamp M, Sold M, Mack S, Pilz L, Ebert M, Kaehler G. Submucosal injection with waterjet improves endoscopic mucosal resection of colorectal adenoma – a randomised controlled clinical trial. Scand J Gastroenterol 2017; VOL. 52, NO. 2, 222–227
\textsuperscript{2a} Belle S, Collet PH, Szyrach M, Ströbel P, Post S, Enderle MD, Kähler G. Selective tissue elevation by pressure for endoscopic mucosal resection of colorectal adenoma: first clinical trial. Surgical Endoscopy 2012; Volume 26
The ERBEJET®2 allows me to safely apply submucosal injections in mucosal tumors, even with large expansion or a difficult anatomical position. The reliability with which a large fluid cushion can always be created precisely in the submucosa, is impressive. This enables us to “crack” even the toughest cases, so that no adenoma is ever operated on unnecessarily.

Prof. Georg Kähler
Head of Central Interdisciplinary Endoscopy
University Clinic Mannheim
ESD with HybridKnife®

☑ ESD is a technique for the complete, reliable en-bloc resection of neoplasias in the stomach\textsuperscript{12}

☑ ESD with the HybridKnife® is faster and easier than in comparison with conventional ESD as fewer instrument changes are necessary\textsuperscript{10,12}

☑ ESD with the HybridKnife® is a reliable and effective method for treating large LST-lesions (laterally spreading tumors) of the rectum en-bloc and curatively\textsuperscript{11,13}

☑ The en-bloc resection rate of rectal LST is 85 %\textsuperscript{13}

☑ ESD with the HybridKnife® can achieve complete local remission of neoplasias in the stomach in approx. 90 % of patients\textsuperscript{12}

☑ The HybridKnife®-ESD could become the method of choice in the local treatment of neoplasias in the gastrointestinal tract\textsuperscript{14}


\textsuperscript{13} Repici, A et al. A prospective, single center study of endoscopic sub-mucosal dissection of rectal LST lesion larger than 3cm by using an innovative concept of injecting and Cutting: The water-Jet Hybrid-Knife (ESD-H). Gastrointest Endosc Vol 73, Issue 4, Supplement, Page AB156, April 2011

\textsuperscript{14} Neuhaus, H. Endoscopic mucosal resection and endoscopic submucosal dissection in the West – too many concerns and caveats? Endoscopy 2010; 42: 859 – 861
We treat our patients with the HybridKnife® as it provides perfect conditions for fast resection or submucosal endoscopy (e.g. POEM or STER) with a low complication rate. With the waterjet, we create a submucosal fluid cushion which offers protection against perforations as well as compressing the blood vessels and making them highly visible. This reduces bleeding episodes during surgery. However, should bleeding occur, it can usually be arrested easily through coagulation with the HybridKnife®. Changes of instruments are only rarely required.

Prof. Horst Neuhaus
Chief Physician Medical Clinic
Evangelical Hospital Düsseldorf
HybridKnife® is not just elevating, it also allows me to manage all the other steps of an ESD with the same instrument. In combination with the modes of the VIO® 3 generator, HybridKnife® is my preferred choice for the en-bloc resection of lesions in the GI tract.

Prof. Alessandro Repici
Clinical Director
Endoscopic Diagnostics and Surgery
Humanitas Research Hospital, Milan
I started using the HybridKnife® O-Type next to the I-Type in the more difficult to reach areas and learned about the great versatility this knife has to offer. It really makes ESD a single-instrument procedure. It makes a full circumferential incision in a ‘lift-and-cut’ fashion, without having to remove the knife a single time, rather easy. This is true even in retroflex positions.

The knife can cut in forward positions as well as lateral cutting and dissecting while hooking tissue in awkward positions without having to fear deeper thermal injury. Bleeding can be managed with the knife with submucosal lifting at my disposal at any time. I hardly use a coagulation forceps anymore.

Dr. Arjun Koch
Department of Gastroenterology and Hepatology
Erasmus MC, Rotterdam
Various endoscopic techniques were developed for mucosa resection. Endoscopic submucosa dissection (ESD) is required for lesions greater than 2 cm due to a high risk of relapse in piece-meal resection. An interesting novel development for performing ESD is given by the HybridKnife® which has become well established over the past 10 years, and which was developed for the en-bloc resection of large dissections. This method is a combination of a waterjet which elevates the mucosa, and a radio-frequency [electrosurgery] technology for ablation with controlled cutting and coagulation technique. The HybridKnife® enables submucosal elevation at a defined pressure into the mucosa with subsequent circumcision and dissection of the lesion to be removed using the same instrument without necessitating a change.

The advantages of the method are considerable time savings and a significant reduction in perforation risk, as injection and cushion formation are possible at any time. The technique can be used both in the esophagus, stomach, as well as the colon and rectum. In recent years, submucosal tunneling has become a further field of application, as is, for example, necessary in treating achalasia.

University lecturer, Dr. Brigitte Schumacher
Clinic for Internal Medicine and Gastroenterology
Elisabeth Hospital Essen
Resected tissue after circumferential, tubular ESD

Resection bed after dissection of the lesion
POEM with HybridKnife®

- Procedural time in POEM with the HybridKnife® is significantly shorter as instrument exchange is unnecessary\(^{18}\)
- POEM can be performed quicker with the HybridKnife® as elevation is facilitated and as the type of elevation leads to less bleeding\(^{8}\)
- POEM appears to be a reliable and effective therapy for achalasia\(^{17}\)
- POEM offers a high rate of therapeutic success for roughly 90% of patients with an Eckardt Score of ≤3\(^{18}\)
- The efficacy of POEM is comparable with the (more invasive) laparoscopic Heller myotomy\(^{16}\)

HybridKnife® is my favorite knife in endoscopic resection, such as ESD and POEM procedures for its efficient submucosal injection for creating the submucosal tunnel and accurate cutting and coagulation.

Prof. Ping-Hong Zhou
Head of Endoscopy Center
Fudan University Zhongshan Hospital, Shanghai
Mucosa elevation with the HybridKnife®

Incision of the mucosa
Thanks to HybridKnife®, I can significantly reduce the time taken for doing an endoscopic surgical procedure especially when there is fibrosis and hypervascularity. The credit goes to the all in one capability of this wonderful instrument.

Dr. Amit Prabhaka Maydeo
Baldota Institute of Digestive Sciences
Global Hospital, Mumbai
Ablation of Barrett’s esophagus with HybridAPC

- HybridAPC can be used reliably and effectively for the therapy of Barrett’s esophagus. Surg Endosc. 2015 Jun 24
- In over 90% of Barrett’s patients, complete macroscopic resection can be achieved.
- Histologically confirmed complete ablation could be achieved in over 90% of the patients.
- The risk of stricture formation can be as low as 2% and is thus lower than with other ablation techniques.
- Thermal ablation of the mucosa without causing major damage to the musculature is possible with the HybridAPC.
- Thermal ablation of residual Barrett’s with APC significantly reduces the relapse rate compared with endoscopic monitoring (3% to 36.7%).
- HybridAPC improves ablation efficacy.
- On average, the following number of sessions is required for Barrett’s ablation:
  - Standard APC: 3.5 sessions
  - Barrx™: 3.2 sessions
  - HybridAPC: 2.5 sessions
- HybridAPC significantly reduces the side effects of APC application without elevation, for example, the stricture rate or post-operative pain.
- The method has the potential of being as good as the gold standard radiofrequency ablation.
With injection under the tissue and ablation with a probe, the HybridAPC allows me to perform fast and safe ablation of the Barrett’s mucosa. Transitions to scars following EMR or ESD can be treated easily, controlled and effectively with this technique.

Prof. Mario Anders
Chief Physician Clinic for Internal Medicine
Gastroenterology and Interdisciplinary Endoscopy
Vivantes Wenckebach Clinic, Berlin