TRANSANAL ENDOSCOPIC MICROSURGERY

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NOTES/TEM

- Natural Orifice Translumenal Endoscopic Surgery (NOTES)
  - Use of flexible endoscopy to perform surgery through natural orifices (rectum, vagina, stomach)
- Transanal Endoscopic Microsurgery (TEM)
  - First attempt at minimally invasive surgery through, and in, a natural orifice
  - Use laparoscopic instruments through a rigid operating proctoscope

TEM

- Developed by Professor Gerhard Buess
  - From Tuebingen, Germany
  - Became available for widespread use in 1983
- One of the first methods of endoluminal surgery
  - Uses the view of a proctoscope and the instruments of laparoscopy

Professor Gerhard Buess

Use of TEM

- For minimally invasive excision
  - Large endoscopically irretrievable rectal polyps and T_1 rectal cancers; some extended used for more advanced disease
- More precise than traditional transanal excision
  - More likely to get clean margins with less manipulation of the mass
- Avoids abdominal incision

Indications of TEM

- Benign
  - Rectal polyps
  - Carcinoid tumors
  - Retrorectal masses
  - Anastomotic strictures
  - Extrasphincteric fistulae
  - Pelvic abscesses
- Malignant
  - Malignant rectal polyps
  - T_1-T_2 rectal cancer
  - Palliative excision of T_3 cancer

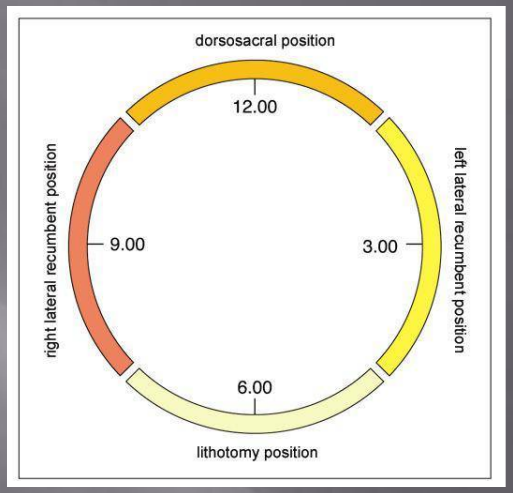
Cataldo PA. Transanal Endoscopic Microsurgery. Surg Clin N Am 2006;915-925.

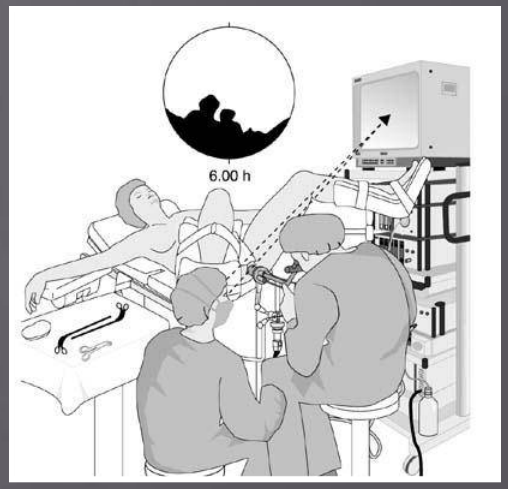
Preoperative Evaluation of TEM

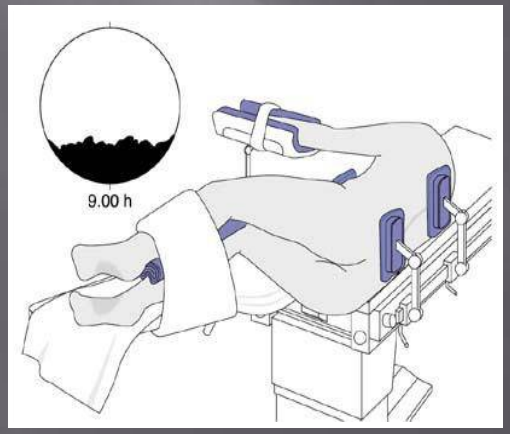
- Full colonoscopy
  - Rule out synchronous lesions
- Rigid proctoscopy
  - Determine level and position of lesion
- Endorectal ultrasound
  - Confirm stage of lesion / depth of penetration
  - Confirm uT_0 or uT_1 status
    - If uT_2 or uT_3 should do definitive surgery if patient a candidate
    - TEM is not generally used to treat N_1 disease

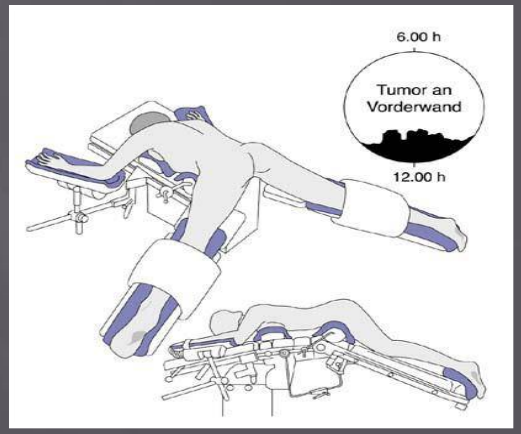
Patient Positioning in TEM

- Position of lesion determines positioning of patient on the operating room table
- The lesion should be made to be in the 6 o'clock position for the operator

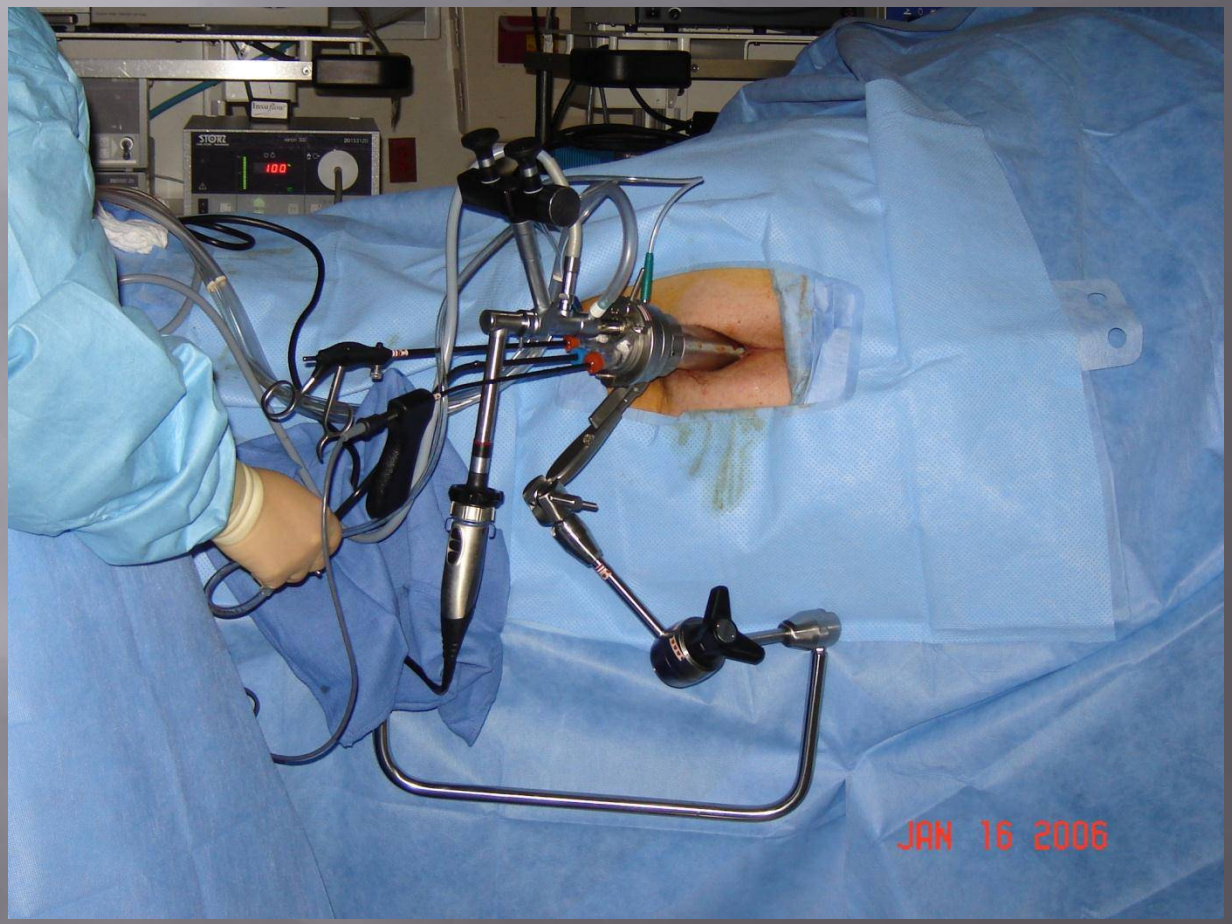








Patient Positioning in TEM



Lesion at right lateral position

Equipments used in TEM

- Rigid proctoscope
- Operating instruments
- Stereoscope
- Insufflator-suction device

- Setup available by Wolf Surgical Instruments Co. (Vernon Hills, IL, USA) or Karl Stortz GmbH & Co. (Tuttlingen, Germany)

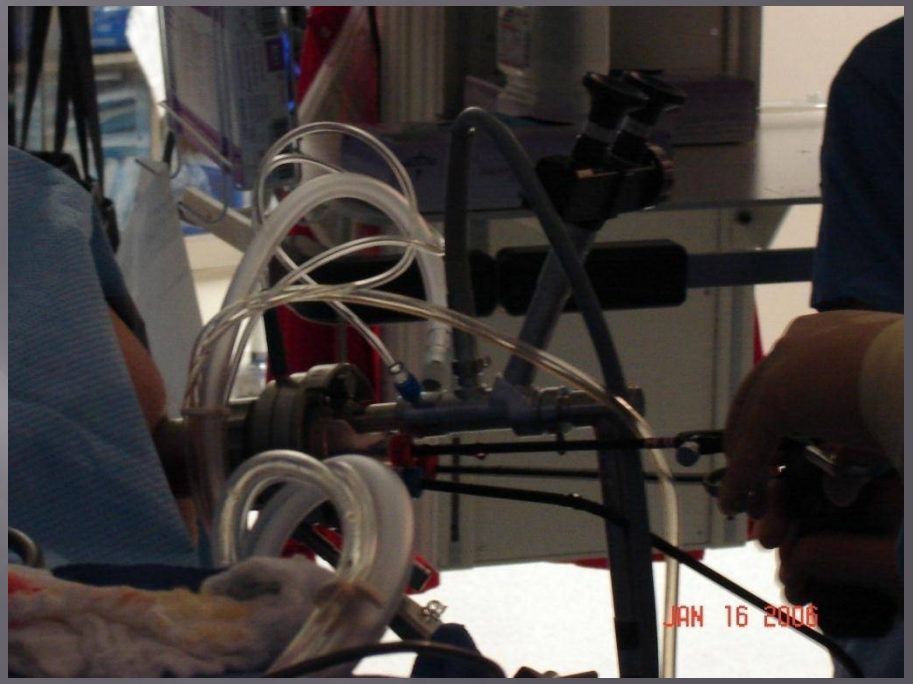
Proctoscope used in TEM

- 40 mm operating proctoscope

Operating Instruments in TEM

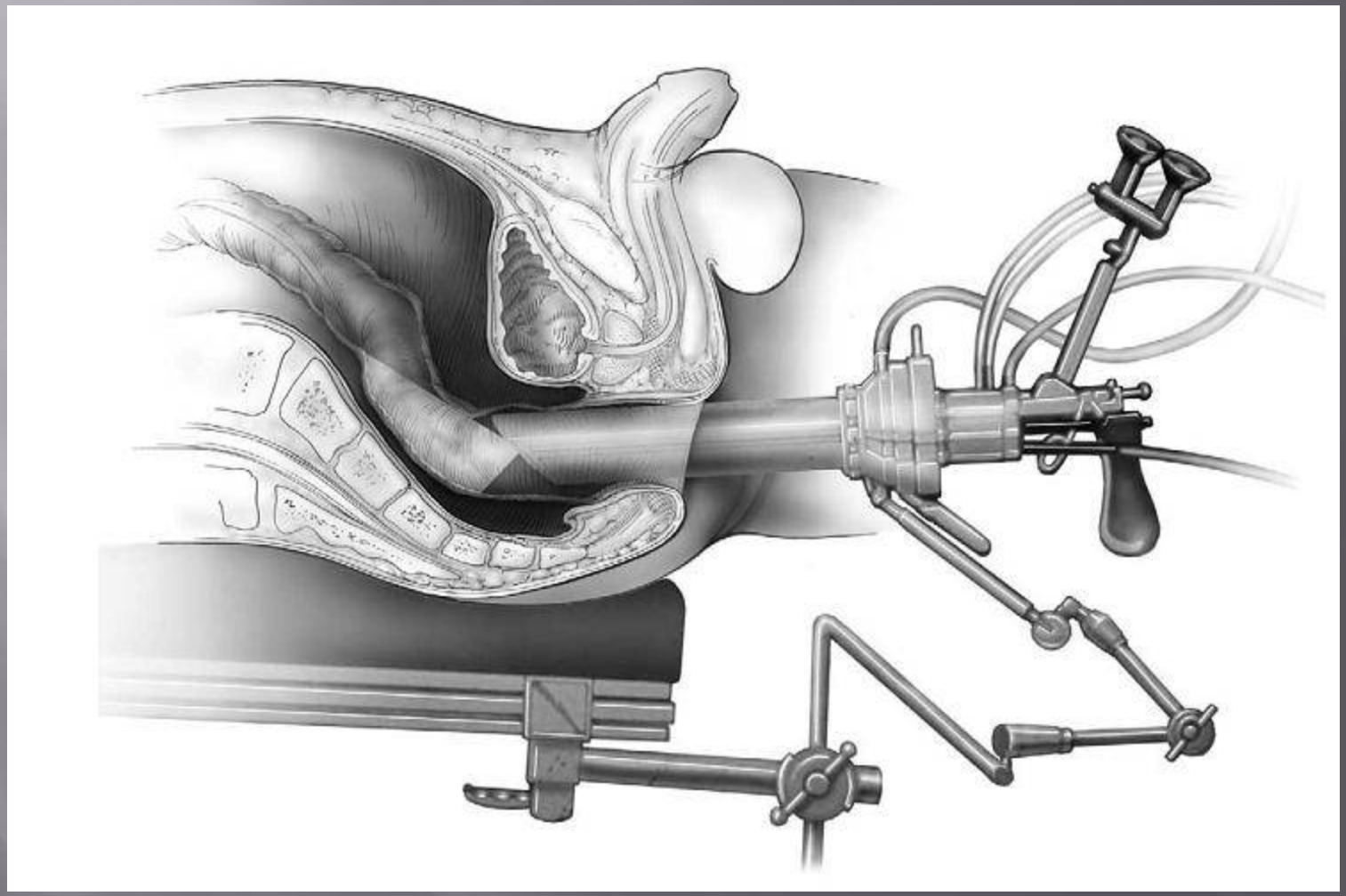
- Angle of instruments key in manipulation of tissues with limited range of motion
- Graspers, suction, electrocautery, needle-holders, etc.

Stereoscope used in TEM

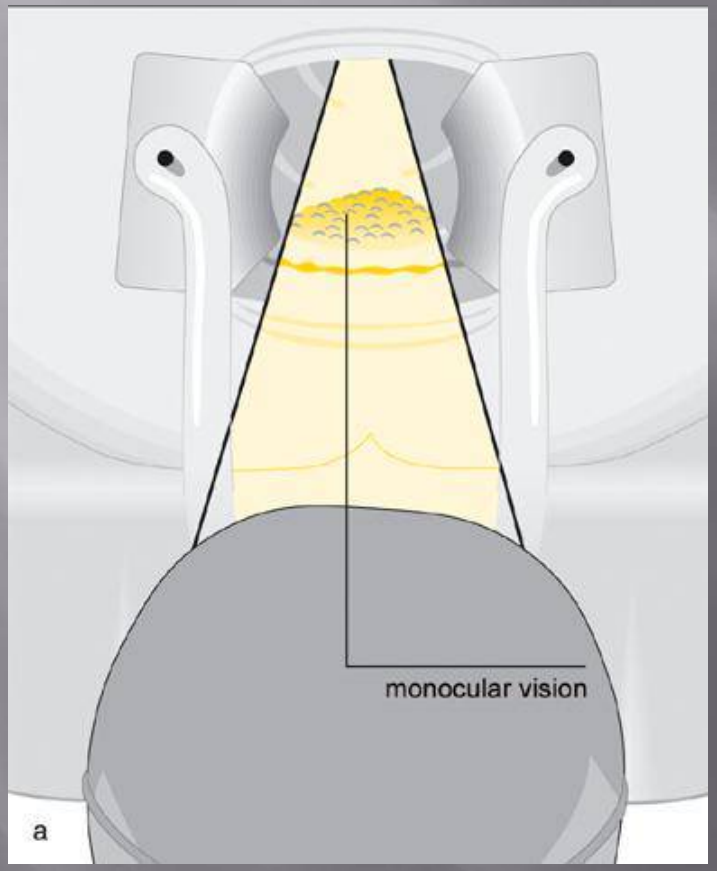


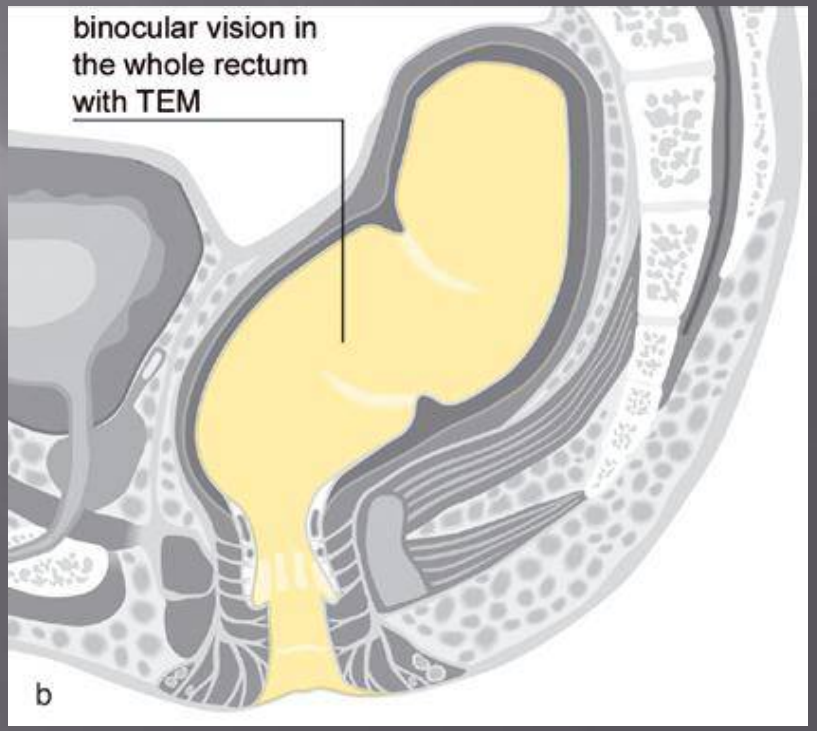
- Provides binocular vision
- Microscope – magnifies 6x

Stereoscope



Visualization with TEM



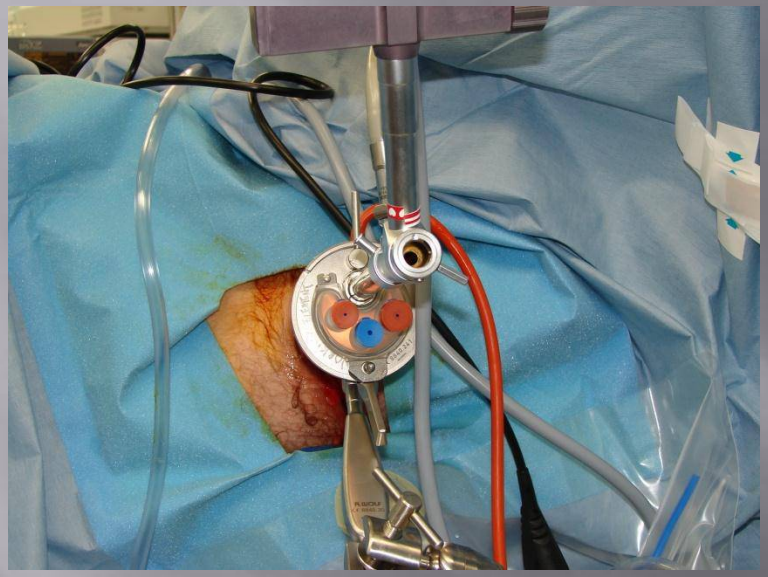


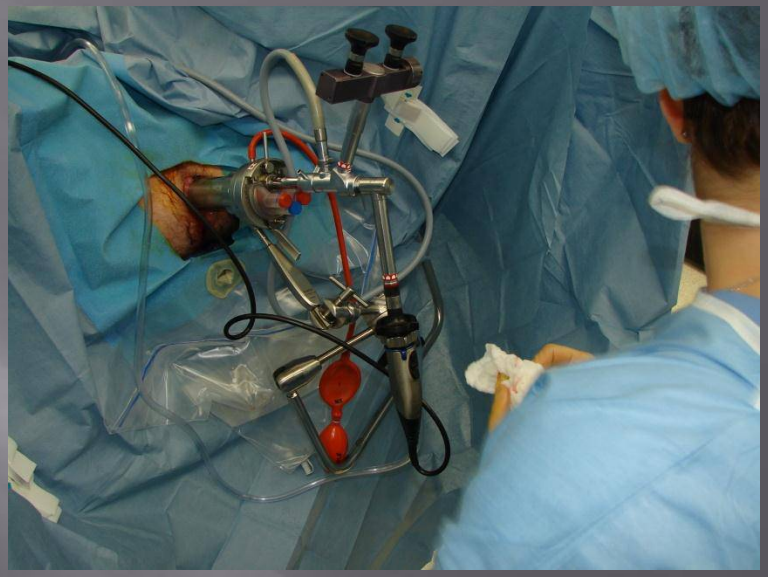
Insufflator-Suction Device used in TEM

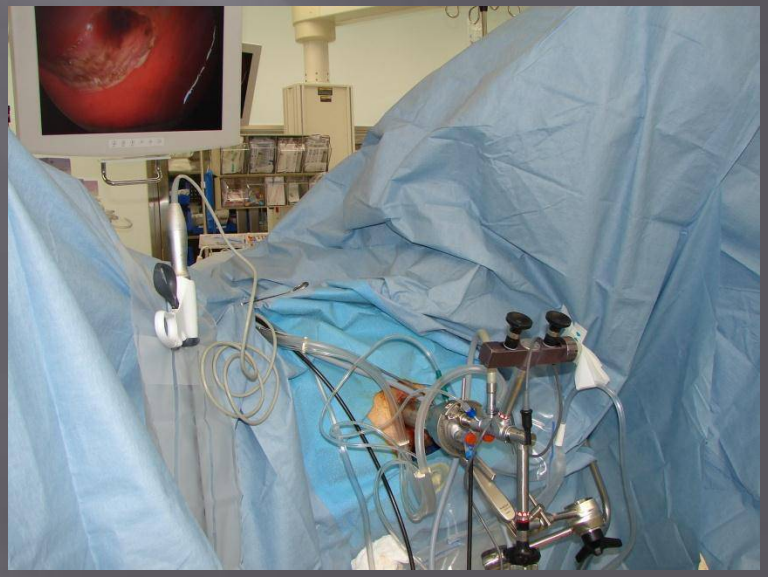
- Maintains continuous pressure by constantly insufflating CO_2 into the rectum and suctioning CO_2 out – maximizes operating field

TEM Procedues

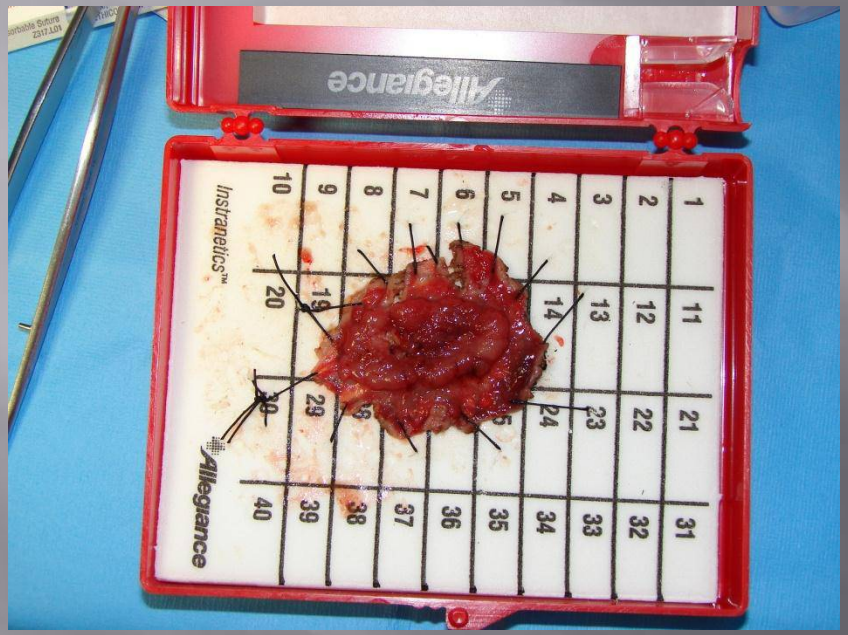
TEM

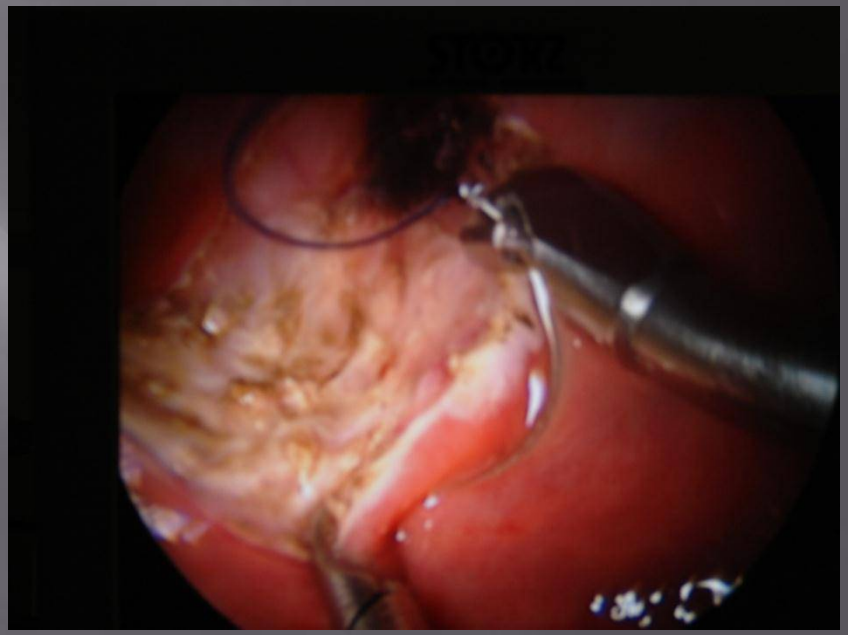






TEM





TEM: Positioning

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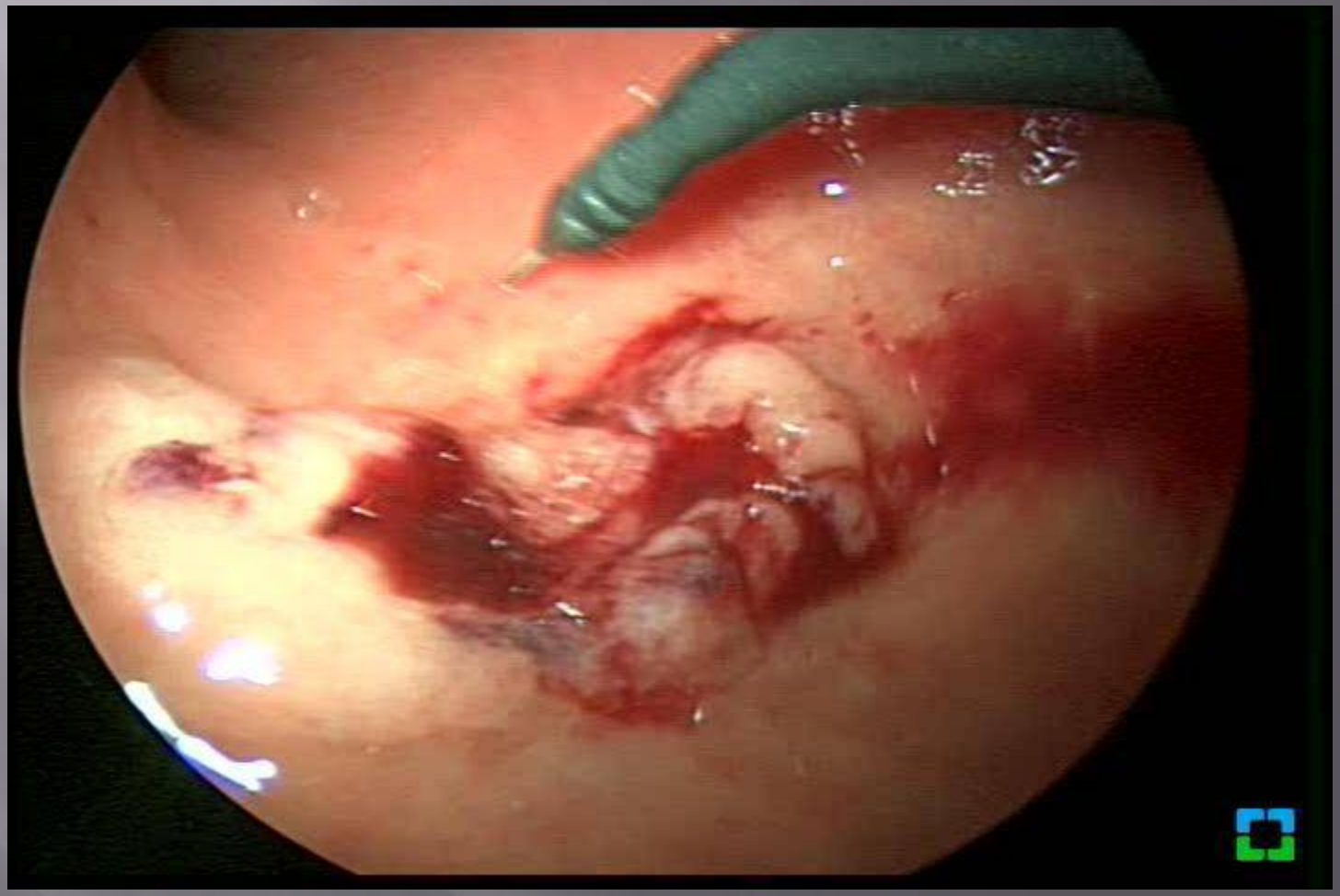
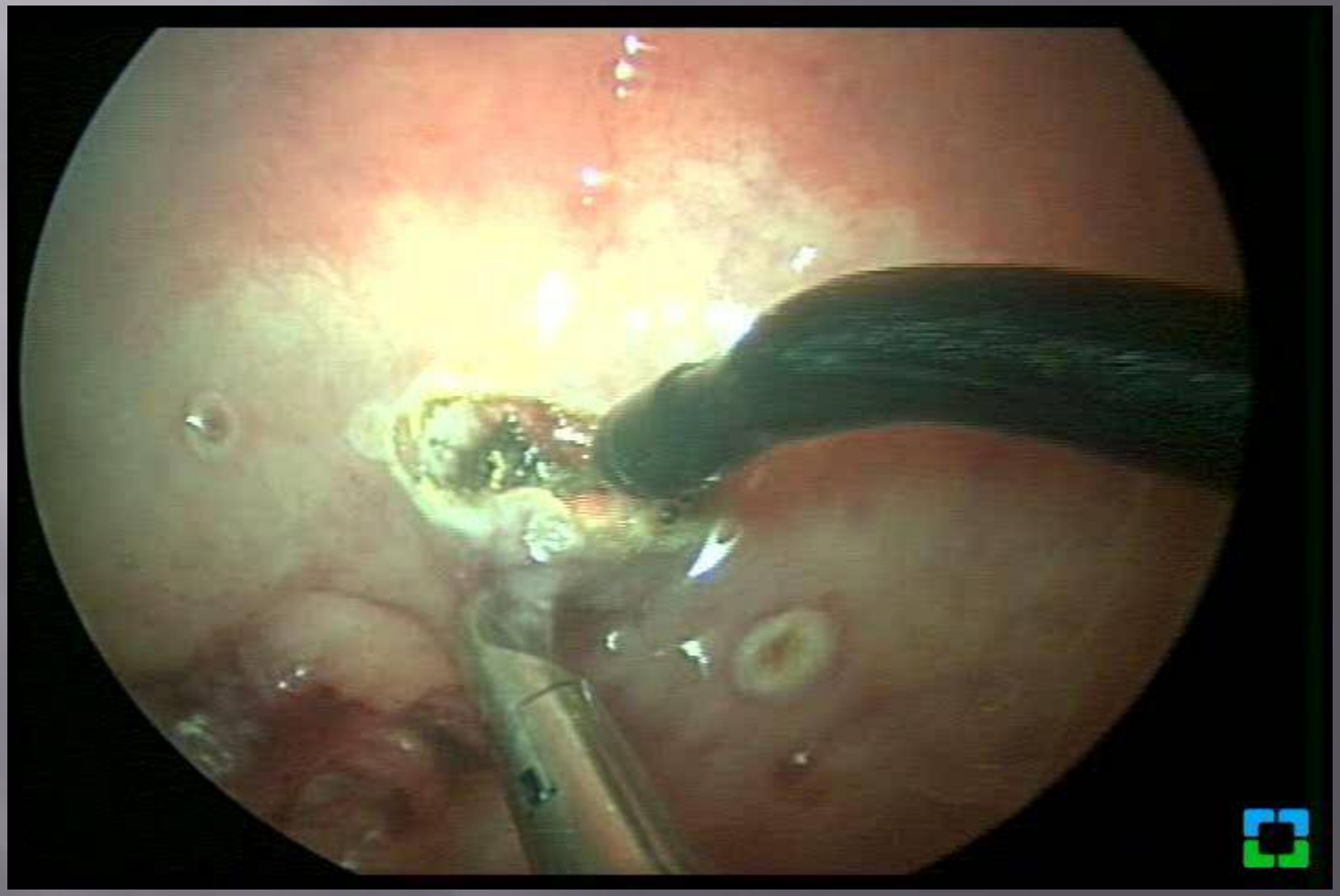
TEM: Marking



TEM: Excision



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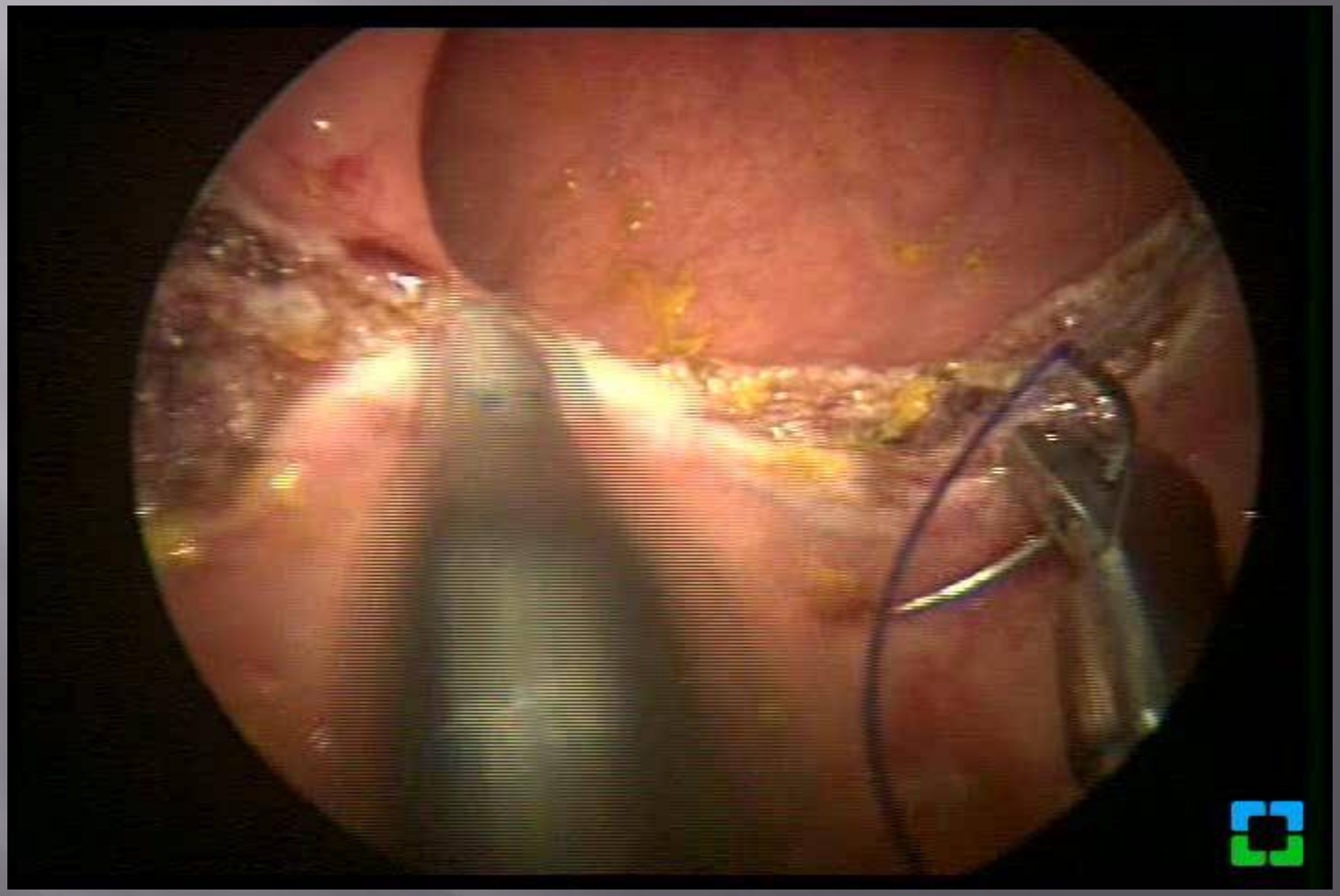
TEM: Closure



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TEM Results

- Professor Buess published early results in 1987
  - 75 patients
  - 3 experienced complications in short-term follow-up
  - 1 with recurrence requiring salvage surgery

Buess G, et al. Endoscopic microsurgery of rectal tumors. Endoscopy 1987;suppl 19 1:38-42.

TEM Results

- Later series by Buess in 1994
  - 265 patients; 1989-1993
  - 190 adenomas; 75 rectal cancers
  - 14 month follow-up in >90% patients
- Average OR time - 92 minutes
  - Mucosectomy - 62 minutes
  - Partial wall excision - 77 minutes
  - Full thickness excision - 96 minutes
  - Segment resection - 163 minutes

Mentges B, Buess G, et al, End. Surg. 1994

TEM: for Rectal Tumors

- Complications
  - Perforation of intraperitoneal rectal wall – unable to close using TEM in 3.9%
    - Required LAR (2 patients) or diversion (1 patient)
  - Early mild incontinence / soiling in 2.6%
    - Resolved by 10 weeks
- No mortality

Zacharakis E, et al. Transanal endoscopic microsurgey for rectal tumors: the St. Mary's experience. Am J Surg 2007;194:694-698.

TEM: Conclusions

- Technically demanding procedure
- Utilizes highly specialized instrumentation
- Advanced endoscopic technique
- Can spare selected patients laparotomy and anterior resection
- Adequate training is imperative
- Patient selection is paramount

Thanks