TRANSANAL ENDOSCOPIC MICRO SURGERY

R. K. Mishra
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

World Laparoscopy Hospital
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
  - T1-T2 rectal cancer
  - Palliative excision of T3 cancer

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

World Laparoscopy Hospital
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 Storz GmbH & Co. (Tuttlingen, Germany)
Proctoscope used in TEM

- 40 mm operating proctoscope
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

World Laparoscopy Hospital
Visualization with TEM

monocular vision

binocular vision in the whole rectum with TEM
Maintains continuous pressure by constantly insufflating CO\(_2\) into the rectum and suctioning CO\(_2\) out – maximizes operating field
TEM
TEM: Positioning

World Laparoscopy Hospital
TEM: Marking

World Laparoscopy Hospital
TEM: Excision
TEM: Closure
**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

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
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
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