LOS ANGELES

COLON AND RECTAL SURGICAL ASSOCIATES

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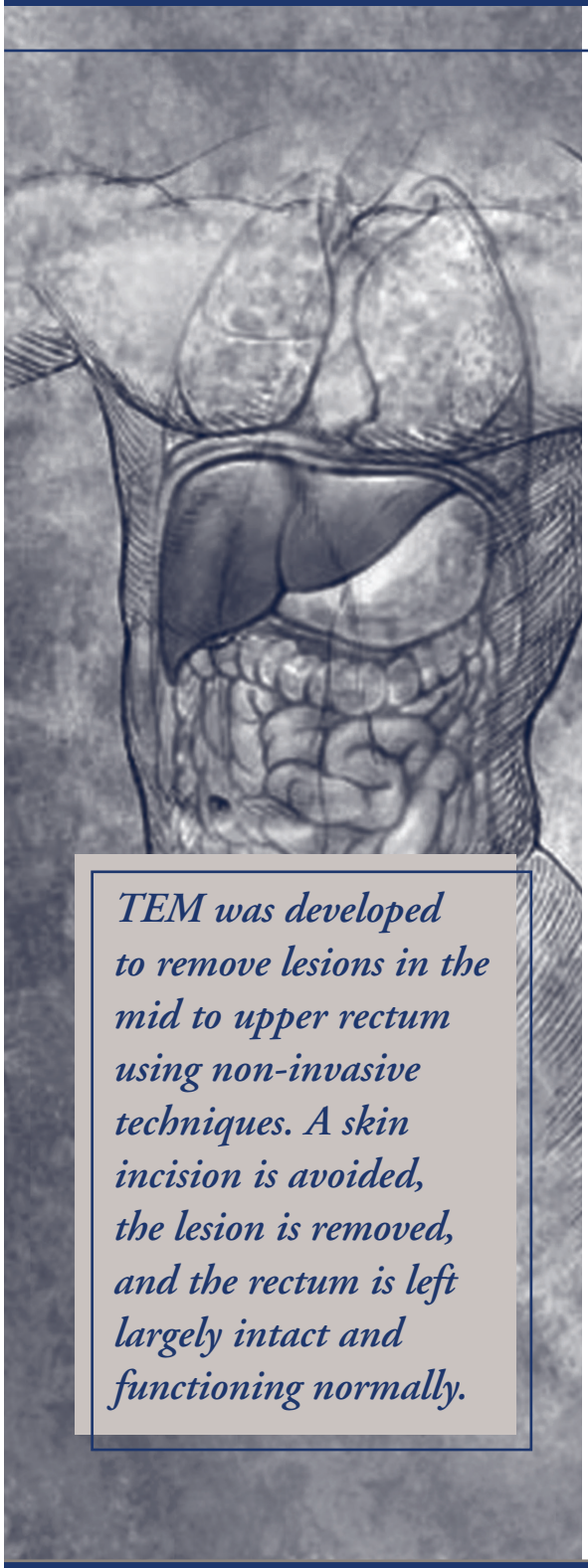


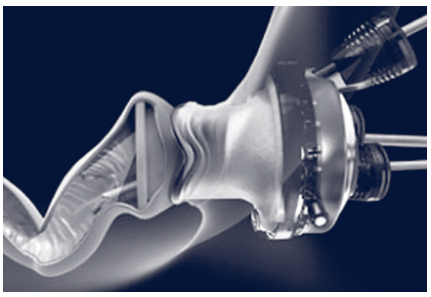
# TEM. TAMIS.

## Same Local Excision. Different Acronyms.

*TEM was developed to remove lesions in the mid to upper rectum using non-invasive techniques. A skin incision is avoided, the lesion is removed, and the rectum is left largely intact and functioning normally.*

### ALPHABET SOUP

What is TEM? What is TAMIS? **Transanal Endoscopic Microsurgery** (TEM), or **Transanal Minimally Invasive Surgery** (TAMIS) are two acronyms for the same operative procedure, in which a rectal mass or lesion is removed using a minimally invasive approach through the anal opening. TEM was developed to remove lesions in the mid to upper rectum using non-invasive techniques. A skin incision is avoided, the lesion is removed, and the rectum is left largely intact and functioning normally. TEM is performed endoscopically using a camera and instruments placed through the anus, into the rectum. First described in 1983, TEM offered obvious advantages to open surgery. And then TAMIS, a 2009 variation of TEM, became the more common procedure.



The TAMIS System

### LOCAL RESECTION. WHY TEM? WHY TAMIS? WHY NOT!

To understand the advantages of transanal resection techniques, it is helpful to understand what TEM/TAMIS are not. The surgical alternatives to a local resection are a transabdominal resection, the York-Mason technique or the Kraske technique, all of which can involve considerable morbidity. The Kraske and York Mason approaches involve removing part of the sacro-coccygeal complex and transecting varying amounts of anal sphincter in order to resect a rectal lesion. While laparoscopic or robotic techniques have helped lower the morbidity of traditional abdominal approaches to the rectum, the recovery period remains arduous. With TEM/TAMIS the surgeon is able to avoid using an abdominal or coccygeal incision, by operating through the body's natural orifice, the anus. Oftentimes the patient is discharged home on the same operative day from an outpatient surgical center.

Using TEM/TAMIS, the surgeon benefits from superior visualization and magnification of the lesion to be removed. This is important in achieving more precise surgical margins of normal tissue around the lesion, while avoiding fragmentation of the lesion during the extirpation. Full-thickness excision is possible and the rectal excision site is closed in a precise fashion.

### HOW TO EVALUATE A PATIENT FOR TEM/TAMIS.

For benign disease, local excision is indicated in the treatment polyps of any circumference, carcinoids, fistulas, and for GIST (Gastrointestinal Stromal Tumors). For malignant disease, local excision may be used to resect moderate, to well differentiated $T_1N_0$ lesions (lesions penetrating only into

*continued on back...*

*...continued from front*

the rectal submucosa and without involved lymph node spread), and without perineural or lymphangioinvasion. With more advanced $T_2$ or $T_3$ rectal cancers, TEM or TAMIS are indicated only for palliation, or if the patient is unable or unwilling to undergo an abdominal operation. In terms of the lesion's location, TEM or TAMIS are possible if the lesion can be visualized with a rigid proctosigmoidoscope in the office. A lesion that is within 20 cm from the anal verge posteriorly, 12 cm anteriorly, and 15 cm laterally is within the optimal range of the instrumentation.

Once a patient has been determined to be a good candidate for TEM or TAMIS, a complete pre-operative evaluation is needed. A rigid proctosigmoidoscopy is performed to assess the level of the tumor, and a colonoscopy is done to rule out synchronous lesions. An endorectal ultrasound or MRI is used to evaluate the depth of the lesion and evaluate any nodal involvement. A CT scan is helpful to assess metastasis in instances of malignancy. Preoperative staging is extremely important in choosing the appropriate candidates for a local excision, as recurrence rates increase with increasing T stage, and local excision is usually reserved for $T_1$ lesions.

A full bowel prep is needed the day prior to surgery. General anesthesia is used and the patient is positioned in the lithotomy, lateral, or prone position, depending on the location of the lesion.

Close post-procedure follow up is needed. For benign lesions, an office exam with rigid proctosigmoidoscopy is performed every three months for a year and then annually thereafter. A colonoscopy should be done in one year after surgery. For malignant lesions, an endorectal ultrasound and rigid proctosigmoidoscopy should be performed every three months for two years, then every six months for two more years, and then annually. As with benign lesions, a colonoscopy should be performed in one year after removal of a malignant lesion.

## TEM?

How is TEM performed? Traditional TEM utilizes a rigid beveled rectoscope with a diameter of 40 mm, with lengths of either 12 cm or 20 cm. Long instruments and a 30 degree laparoscopic camera are inserted into the rectoscope through multiple ports. The surgeon performs the operation after insufflating the rectum with carbon dioxide and while looking through a binocular stereoscopic eyepiece. This system has expensive start up costs and a steep learning curve for surgeons performing this delicate operation, in a narrow space. Because of its complexity and need for specialized training, not to mention the costly instrumentation, TEM is only used by a small number of high-volume specialists. Despite TEM having been introduced over three decades ago, its acceptance has been slow due to the technical-skill limitations as well as the relatively small number of patients meeting the strict selection criteria for using this local resection technique.

## OR TAMIS?

In an attempt to expand the surgeon's armamentarium in approaching rectal lesions, TAMIS was introduced in 2009. TAMIS was developed using the laparoscopic concept of a single port with inserted surgical devices, as a lower-cost alternative to TEM. Instead of using a TEM rigid rectoscope as the insertion point, a laparoscopic gel-like faceplate is used for better instrument maneuverability. TAMIS also utilizes a closed endoscopic system with a camera and long instruments. A 5 mm laparoscopic camera, is used as well as standard laparoscopic instruments. Suturing of the mucosal defect is also possible using specialized instruments.

## LOCAL EXCISION. WHY TEM? WHY TAMIS? WHY NOT?

Even though local excision is a minimally invasive technique, complications are still possible. Morbidity ranges from 4% to 29% as compared to a radical proctectomy which has risks ranging from 18% to 55%. Recurrence of the lesion, urinary retention, bleeding, rectal stenosis, wound dehiscence, fecal soiling or leakage due to sphincter dysfunction, rectovaginal fistula in women, entry into the abdominal cavity during the procedure, and conversion to laparotomy are all risks of TEM/TAMIS. Although peritoneal entry is possible with TEM or TAMIS, this does not necessarily mandate a conversion to laparotomy. Suturing closed the peritoneal defect is usually possible without untoward effects. Suturing the rectal wound transversely instead of longitudinally also avoids rectal narrowing or stenosis.

Intra-operative bleeding is more common with a larger lesion, and urinary retention is more common with an anterior lesion, especially in males. Fecal incontinence or fecal soiling has been reported but usually in small numbers. Prior to the insertion of the instruments, an adequate perianal and pudendal anesthetic block with gentle dilation can help prevent over-stretching of the anal sphincter complex, potentially decreasing the incidence of post-operative incontinence.

Recurrence of the lesion has been a concern and has been reported to be around 5% at a two year follow up. Using TEM or TAMIS, recurrences of $T_1$ lesions have ranged from 4%-14%, $T_2$ at 7%-34%, and $T_3$ at 5%-50%. These numbers dovetail with the entire topic of local excision in the treatment of rectal cancers. It is generally believed that local excision for anything other than a $T_1$ lesion may expose patients to an inordinately high recurrence rate compared with the rate of recurrence following laparoscopic or robotic abdominal procedures. Local excision is generally reserved for use in $T_1$ lesions or in patients unable or unwilling to undergo the larger extirpative operations.

## LOCAL EXCISION? TEM OR TAMIS? ASK THE SURGEON.

The decision to proceed with a local excision of rectal lesions should be guided by a knowledgeable colorectal surgeon, after evaluating many variables related to both the patient and the lesion itself. Despite the risk of complications, TEM and TAMIS are associated with less morbidity and mortality compared to a radical proctectomy with total mesorectal excision. Used by skilled surgeons, local excisions of rectal lesions may allow patients to benefit from the tremendous advances in less invasive surgical techniques. Robotic control of the TEM/TAMIS instruments may allow even more precise and better operations in this remote region of the body. As always, the surgeon and surgical experience are critically important in all aspects of the treatment of hard-to-reach rectal lesions.