

Trans-anal minimally invasive surgery for rectal neuroendocrine tumors

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AIM

There is no literature that mainly searched for rectal neuroendocrine tumor (rNET) using transanal minimal invasive surgery (TAMIS). We report our clinical experiences of TAMIS for rectal neuroendocrine tumors to evaluate the feasibility and safety.

METHODS AND PROCEDURES

Between December 2010 and March 2020, the twenty-five consecutive patients with rectal neoplasma underwent the TAMIS procedure performed by single laparoscopic surgeon at the two hospitals. Of these, ten patients with rectal neuroendocrine tumors were reviewed retrospectively. The full-thickness excision down to the outer fatty tissues was completed using TAMIS technique. Clinicopathological findings, perioperative and postoperative complications were recorded.

RESULTS

TAMIS for small rNET was successfully completed in all cases. There were seven cases with a tumor size of less than 10 mm, and three cases with a tumor size between 10 and 15 mm. Six patients underwent the primary tumor excision; the remaining four patients underwent resection for the scar after endoscopic procedure. The median surgical duration was 80.5 (53–124) minutes and the median blood loss was 1 (1–12) ml. All removed tumors in the 6 primary excisions were diagnosed as neuroendocrine tumor G1. The margins of specimens were completely free in all cases. Among the four patients after endoscopic procedure, all had no histological evidence of residual tumor. The median length of hospital stay was 7 days post-operatively. There was no post-operative mortality or severe complication. The median length of observation was 54 months. No recurrence, no local or distant metastasis and no mortality of all patients were observed.

CONCLUSION

TAMIS is safety and feasible procedure for small rNET. Further experience and clinical trials are needed to fully define the advantages, disadvantages, and indications of TAMIS for rNET.

Conflict of Interest Statement

We have no conflict of interest.

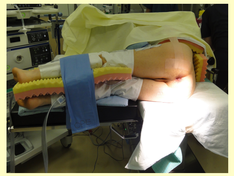
Patients surgical positions



Lithotomy position



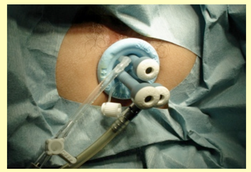
Jack-knife position



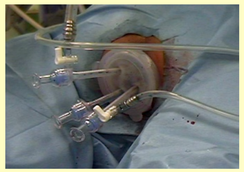
Right lateral position

The patient was placed in a position whereby the tumor was exposed at 6 o'clock

Platforms for TAMIS procedure



SILS™ port

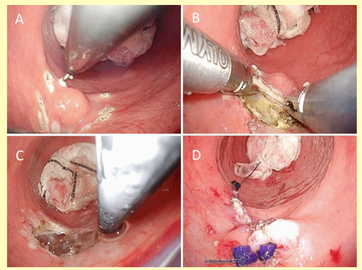


E・Z™ access port

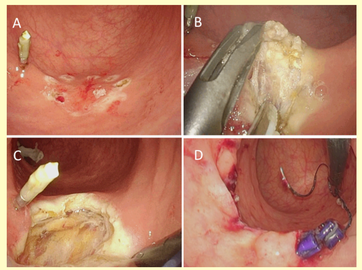


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Procedure



Full-thickness excision of a rectal neuroendocrine tumor



Full-thickness excision of a rectal scar after ESD

A. Safety margin around the tumor was defined by coagulation marks using hook electric cautery in a circumferential fashion.
B. Full-thickness excision down to the outer fatty tissues was completed en block standard laparoscopic instruments and using ultrasonic surgical scissors.
C. Defects created by resection were irrigated with saline solution.
D. After suturing of the rectal wall with absorbable suture clips.

Patients and tumor characteristics

Variable (N =10)	(range)
Age (range)	66 (46–80)
Gender (male/female)	7/3
BMI (kg/m^2)	23.9 (19.3–30.1)
Tumor size (mm)	8 (5–13)
<10/10–15 (mm)	7/3
Tumor location from anal verge (cm)	7.0 (5.5–12.0)
Direction of tumor at rectum	
anterior/posterior/right/left	2/1/4/3
Preoperative endoscopic procedure	
none/biopsy/EMR/ESD	6/1/2/1
Pathology (NET) after endoscopic procedure	4
G1 TX margin positive	1
G1 T1a vertical margin positive	3

EMR endoscopic mucosal resection, *ESD* endoscopic submucosal dissection, *NET* neuroendocrine tumor

Postoperative outcomes

Variable (N =10)	(range)
Morbidity	3
Bleeding	0
Emphysema	0
Pelvic abscess	0
Anal fissure	2
Fecal incontinence	0
Rectal stenosis	0
Delirium	1
Mortality	0
Postoperative hospital stay (days)	7 (2-12)

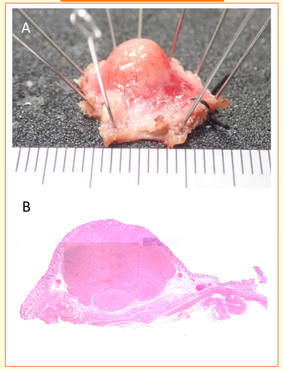
Outcomes of transanal minimal invasive surgery

Variable (N =10)	(range)
Types of platform	
SILS/EZ FF07/Free Access	1/7/2
Surgical duration (min)	80.5 (53-124)
Estimated blood loss (mL)	1 (1-12)
Pathology (NET G1)	
T1a/T1b/NRT	3/3/4
Lymphatic invasion (negative/positive)	9/1
Vascular invasion (negative/positive)	9/1
Surgical margin (negative/positive)	10/0

NET neuroendocrine tumor, *NRT* no residual tumor (cases after endoscopic procedure)

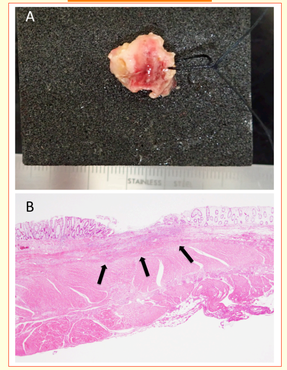
Resected specimens

Completely removed neuroendocrine tumor



A. The neuroendocrine tumor including muscularis propria removed with safe surgical margin.
B. Clear lateral and deep excision margins (loupe statue of hematoxylin and eosin stained slide).

The specimen after ESD



A. The specimen with safe margin.
B. No histological evidence of residual tumor and the inflammatory cells penetrated to the surface layer of muscularis propria under the scar of the endoscopic resection (black arrows) (stained hematoxylin and eosin; magnification, x 40).

None of all patients had fecal incontinence and recurrence of rectal NET