

Case Series

Transanal minimally invasive surgery for complex rectal adenomas in a regional colorectal unit: early outcomes within a collaborative tertiary network

Cambo Keng*, Sze Mun Thor, Zainab Naseem

Department of General Surgery, Goulburn Valley Health, Shepparton, Victoria, Australia

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*Correspondence:

Dr. Cambo Keng,

E-mail: cambokeng@gmail.com

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ABSTRACT

Transanal minimally invasive surgery (TAMIS) is an established technique for local excision of complex rectal adenomas, predominantly performed in tertiary colorectal centres. Access in regional hospitals remains limited. We report our early experience of introducing TAMIS within a regional colorectal unit through structured collaboration with tertiary colorectal services, through a case series of three consecutive patients undergoing TAMIS for complex rectal adenomas in a regional general surgery unit between August and November 2025. One patient underwent staged diagnostic and definitive excision. Lesion size ranged from 25-40 mm and were located in the low to mid rectum. All procedures were completed successfully without conversion. Final histopathology demonstrated tubulovillous adenoma with low-grade dysplasia in all cases. One patient experienced a Clavien-Dindo grade II complication. There were no reoperations or 30-day readmissions. Thus, TAMIS can be safely introduced in selected patients within a regional setting with appropriate multidisciplinary governance and collaborative support. This model enables delivery of organ-preserving surgery closer to home while maintaining safety and appropriate escalation pathways.

Keywords: Transanal minimally invasive surgery, Rectal adenoma, Rectal cancer, Rural surgery

INTRODUCTION

Transanal minimally invasive surgery (TAMIS) was first described as a flexible platform for local excision of rectal lesions, offering an alternative to transanal endoscopic microsurgery (TEM) and conventional transanal excision. TAMIS allows enhanced visualisation, improved ergonomics, and precise dissection while utilising standard laparoscopic instruments.¹

In high-volume colorectal centres, TAMIS has become an established approach for selected benign and early malignant rectal lesions.² However, access to TAMIS in regional and non-tertiary hospitals remains variable, often necessitating referral to tertiary centres for patients with

complex rectal polyps.¹ Such referrals may result in treatment delays, increased patient burden, and escalation to radical surgery for benign disease. This study reports a series of three cases as part of the introduction of TAMIS in a regional general surgery unit and reports early peri-operative and pathological outcomes.

CASE SERIES

All patients underwent colonoscopy with biopsy prior to referral. Pre-operative histology demonstrated tubulovillous adenoma with low-grade dysplasia in two patients and focal high-grade dysplasia in one patient. Lesion location was assessed by colonoscopy and digital rectal examination. Pelvic magnetic resonance imaging (MRI) was performed selectively where there was

concern for malignancy or uncertainty regarding suitability for local excision. Computed tomography (CT) of the chest, abdomen, and pelvis was performed when clinically indicated. All cases were discussed at a multidisciplinary team meeting prior to definitive management.

All TAMIS procedures were performed under general anesthesia with patients positioned in lithotomy. Prophylactic intravenous antibiotics were administered at induction. The GelPOINT Path transanal access platform (Applied Medical, Rancho Santa Margarita, CA) was used in all cases. Pneumorectum was established with carbon dioxide insufflation, and standard laparoscopic instruments with monopolar diathermy and Ligasure were utilised. Resection technique (submucosal or full thickness) and selective defect closure were determined intra-operatively based on lesion characteristics.

Three consecutive patients underwent TAMIS during the study period from 1 February 2025 to 31 December 2025.

Case 1

A 53-year-old male (ASA III, BMI 28 kg/m²) with a history of ischemic heart disease (two coronary stents), chronic obstructive pulmonary disease, hypertension, hypercholesterolemia, and active smoking was referred following identification of a large rectal polyp on screening colonoscopy.

Colonoscopy demonstrated a broad-based semi-circumferential polypoid lesion located approximately 7-8 cm from the anal verge along the right lateral wall of the mid-rectum, concerning for malignancy (Figure 1). Biopsy revealed tubulovillous adenoma with focal high-grade dysplasia.

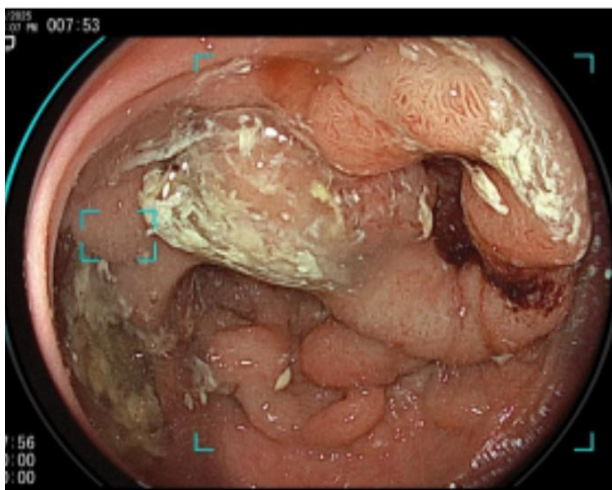


Figure 1: Colonoscopic view of mid-rectal sessile adenoma (case 1).

Demonstrating a large semi-circumferential rectal tumour, 7 cm from anal verge, traversable with scope. Lesion was readily palpable on digital rectal examination.

Pelvic MRI was performed to evaluate depth of invasion and nodal status which demonstrated a lesion confined to the rectal wall without evidence of extramural extension or suspicious lymphadenopathy (Figure 2). Following discussion at the multidisciplinary meeting, a decision was made to proceed with a staged TAMIS approach.

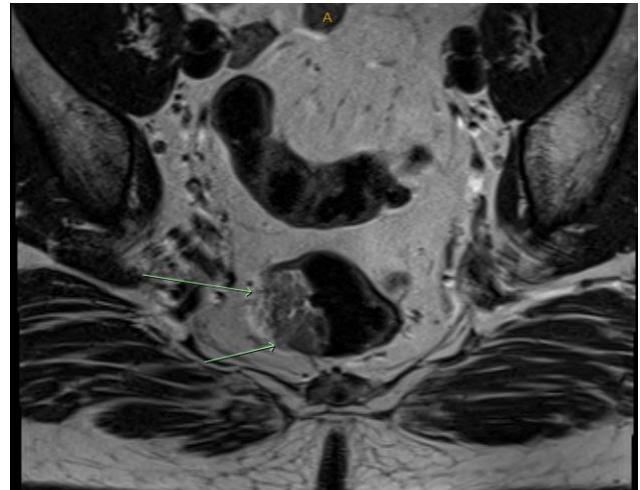


Figure 2: Axial T2-weighted pelvic MRI demonstrating rectal lesion without extramural invasion (case 1).

No abnormal lymph nodes or extramural vascular involvement noted on MRI.

An initial TAMIS was performed to obtain a large biopsy of the rectal mass, followed by definitive full-thickness resection at a second procedure. The second TAMIS procedure required 360 minutes due to near-circumferential involvement and the need for meticulous haemostasis and selective defect closure. An intraoperative view of the lesion during TAMIS is shown in Figure 3.

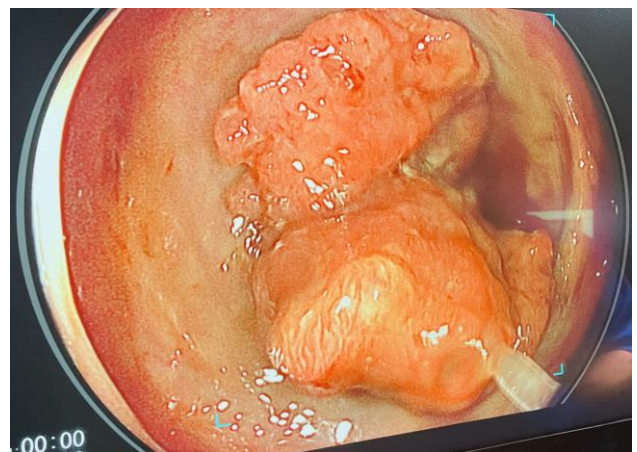


Figure 3: Intraoperative TAMIS view during excision of rectal adenoma (case 1).

Final histopathology demonstrated tubulovillous adenoma with low-grade dysplasia and no invasive carcinoma. Margin assessment was indeterminate due to

diathermy artefact. Postoperatively, the patient experienced chest pain requiring monitoring and patient-controlled analgesia (Clavien–Dindo grade II) and was discharged on postoperative day nine. Endoscopic surveillance was arranged.

Case 2

An 81-year-old male (ASA II, BMI 28 kg/m²) with chronic kidney disease (stage 3b), type 2 diabetes mellitus, hypertension, and polymyalgia rheumatica on immunosuppression was found to have a 25 mm sessile lesion in the low-mid rectum during colonoscopic evaluation.

Colonoscopy demonstrated a sessile lesion not amenable to conventional endoscopic resection due to morphology and location (Figure 4). Biopsy revealed tubulovillous adenoma with low-grade dysplasia. Given lesion characteristics and patient comorbidities, TAMIS was selected for local excision.



Figure 4: Colonoscopic view of low–mid rectal adenoma (case 2).

Submucosal TAMIS resection was completed in 110 minutes without intraoperative complications. Final histopathology confirmed tubulovillous adenoma with low-grade dysplasia. Margins were indeterminate due to piecemeal excision. The postoperative course was uncomplicated and the patient was discharged on postoperative day one with planned surveillance flexible sigmoidoscopy at six months.

Case 3

A 66-year-old female (ASA II, BMI 22 kg/m²) with hypertension was referred following detection of a 40 mm sessile rectal adenoma located approximately 3 cm from the anal verge on colonoscopy.

Endoscopic evaluation confirmed a low rectal sessile lesion (Figure 5). Biopsy demonstrated tubulovillous adenoma with low-grade dysplasia. Given lesion size and

distal location, full-thickness TAMIS excision was undertaken.

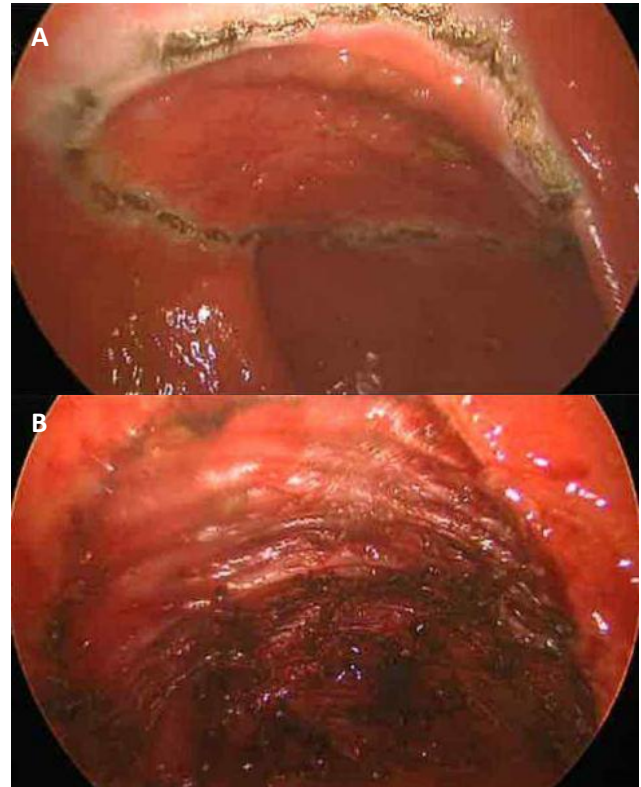


Figure 5: TAMIS view during excision of low rectal tubulovillous adenoma (case 3). (A) Diathermy marking of margins of lesions prior to excision and (B) post excision defect.

The procedure was completed in 80 minutes without intraoperative complications. Final histopathology demonstrated tubulovillous adenoma with low-grade dysplasia and clear margins (R0). The postoperative recovery was uneventful and the patient was discharged on postoperative day two. Endoscopic surveillance was arranged at six months.



Figure 6: TAMIS resection specimen (case 3).

A summary of patient characteristics, operative details, and outcomes is presented in Table 1.

Table 1: Summary of patient characteristics and outcomes, (n=3).

Variables	Value
Male sex	2 (66.7%)
Median age (range), (in years)	66 (53-81)
ASA II-III	3 (100%)
Median BMI (range), (kg/m ²)	28 (22-28)
Lesion size, mm (range)	40 (25-40)
Low-mid rectal location	3 (100%)
Pre-operative focal high-grade dysplasia	1 (33.3%)
Staged procedure required	1 (33.3%)
Full-thickness resection performed	2 (66.7%)
Median operative time (range), min	110 (80-360)
Indeterminate margins	2 (66.7%)
Postoperative complications	1 (33.3%)
30-day readmission	0
Invasive malignancy identified	0

DISCUSSION

This case series demonstrates the feasibility of introducing TAMIS in a regional general surgery unit. While TAMIS is well established in tertiary colorectal centres, reports describing its implementation and early outcomes in non-tertiary settings remain limited.^{1,3} Our experience shows that, with appropriate patient selection and multidisciplinary oversight, TAMIS can be safely performed outside high-volume referral centres.

Several important observations arise from this series. First, careful pre-operative assessment and multidisciplinary discussion were central to decision-making, particularly in cases where imaging or biopsy raised concern for malignancy. In one patient, a staged TAMIS approach allowed definitive histological assessment prior to complete excision, facilitating rectal preservation and avoiding premature escalation to radical surgery or neoadjuvant therapy. The presence of focal high-grade dysplasia on pre-operative biopsy in one patient further supported the role of TAMIS in providing definitive excision and accurate histopathological assessment while avoiding premature radical surgery.^{4,5} This highlights the utility of TAMIS not only as a therapeutic modality, but also as a diagnostic adjunct in selected cases.

Second, operative complexity varied considerably. While two procedures were completed within a standard operative duration, one case required a prolonged operative time due to lesion size, near-circumferential involvement, and the need for meticulous hemostasis and selective defect closure to minimize the risk of postoperative stenosis. Prolonged operative duration in such cases reflects lesion complexity rather than technical

failure and underscores the importance of appropriate case selection during the early phase of service implementation.⁶

Margin assessment following TAMIS can be limited by thermal artefact, particularly in large benign lesions requiring extensive diathermy. In this series, margin status was indeterminate in some cases despite complete macroscopic excision.⁷ In the context of benign pathology, this limitation supports the use of structured endoscopic surveillance rather than immediate radical resection, consistent with accepted practice.

Implications for regional access to care

Access to advanced transanal techniques such as TAMIS is often concentrated in high-volume colorectal centres, necessitating referral for patients managed in regional hospitals.^{1,3} Patients with colorectal cancer and advanced rectal pathology in regional and rural areas have been shown to experience less optimal access to specialist care compared with metropolitan populations.⁸ This includes longer time to definitive surgery, reduced access to subspecialty-trained colorectal surgeons, and greater reliance on inter-hospital transfer for advanced procedures. These disparities are largely driven by workforce limitations, geographic distance, and reduced availability of specialized services in regional settings.⁹⁻¹²

Our experience suggests that, with appropriate case selection and multidisciplinary oversight, TAMIS can be safely delivered in a regional general surgery unit. Importantly, multiple population-based studies have demonstrated that colorectal surgery performed in regional centres is safe and can achieve oncological and perioperative outcomes comparable to those of metropolitan hospitals, particularly when appropriate expertise, case selection, and referral pathways are in place.¹³

This has potential implications for reducing treatment delays, travel burden, patient stress, and escalation to radical surgery for benign rectal disease. In this context, the selective implementation of TAMIS in regional or rural hospitals represents a logical extension of existing evidence, offering an organ-preserving option for appropriately selected patients while maintaining safety and oncological principles.¹⁴ Decentralization of selected minimally invasive colorectal techniques may therefore improve equity of access to organ-preserving surgery while maintaining patient safety.

Limitations

This study has several limitations. The small sample size limits the ability to draw definitive conclusions regarding long-term oncological outcomes and generalisability. Follow-up duration is short, and recurrence rates cannot yet be assessed. In addition, this represents the early experience of a single regional unit, and outcomes may

reflect careful patient selection during the implementation phase. Despite these limitations, the series provides valuable insight into the feasibility and governance considerations of introducing TAMIS in a regional setting.

CONCLUSION

TAMIS can be safely introduced in selected patients within a regional general surgery unit. In appropriately selected cases, TAMIS offers a minimally invasive, organ-preserving option for managing complex rectal adenomas and may reduce the need for tertiary transfers, improving convenience for rural patients by avoiding travel to distant tertiary centres for treatment.

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Ethical approval: Not required

REFERENCES

1. deBeche-Adams T, Nassif G. Transanal minimally invasive surgery. *Clin Colon Rectal Surg.* 2015;28(3):176-80.
2. Albert MR, Atallah SB, deBeche-Adams TC, Izfar S, Larach SW. Transanal minimally invasive surgery (TAMIS) for local excision of benign neoplasms and early-stage rectal cancer: efficacy and outcomes in the first 50 patients. *Dis Colon Rectum.* 2013;56(3):301-7.
3. Lee L, Kelly J, Nassif GJ, Keller D, deBeche-Adams TC, Mancuso PA, et al. Establishing the learning curve of transanal minimally invasive surgery for local excision of rectal neoplasms. *Surg Endosc.* 2018;32(3):1368-76.
4. Sheikh MT. Transanal minimally invasive surgery. *Indian J Colo-Rectal Surg.* 2019;2:3-5.
5. Kızıltoprak N, Aaron J, Diez C, Atallah S. TAMIS: new horizons in modern colorectal surgery. *Turk J Colorectal Dis.* 2025;35:33-40.
6. Lee L, Burke JP, deBeche-Adams T, Nassif G, Martin-Perez B, Monson JR, et al. Transanal minimally invasive surgery for local excision of benign and malignant rectal neoplasia: outcomes from 200 consecutive cases with midterm follow up. *Ann Surg.* 2018;267(5):910-6.
7. George KS, Hyde NC, Wilson P, Smith GI. Does the method of resection affect the margins of tumors in the oral cavity? Prospective controlled study in pigs. *Br J Oral Maxillofac Surg.* 2013;51(7):600-3.
8. Crawford-Williams F, March S, Ireland MJ, Rowe A, Goodwin B, Hyde MK, et al. Geographical variations in the clinical management of colorectal cancer in Australia: a systematic review. *Front Oncol.* 2018;8:116.
9. Department of Health and Human Services. Optimal Care Pathway for People with Colorectal Cancer. Melbourne, Australia: Victorian Government. 2015.
10. Campbell NC, Elliott AM, Sharp L, Ritchie LD, Cassidy J, Little J. Impact of deprivation and rural residence on treatment of colorectal and lung cancer. *Br J Cancer.* 2002;87(6):585-90.
11. Eldin NS, Yasui Y, Scarfe A, Winget M. Adherence to treatment guidelines in stage II/III rectal cancer in Alberta, Canada. *Clin Oncol (R Coll Radiol).* 2012;24(1):e9-17.
12. Sankaranarayanan J, Watanabe-Galloway S, Sun J, Qiu F, Boilesen EC, Thorson AG. Age and rural residence effects on accessing colorectal cancer treatments: a registry study. *Am J Manag Care.* 2010;16(4):265-73.
13. Wichmann MW, McCullough TK, Beukes E, Gunning T, Maddern GJ. Colorectal cancer surgery in rural Australia can match outcomes in metropolitan hospitals: a 14-year study. *Med J Aust.* 2021;214(4):186-7.
14. Dobbs E, Samanta D, Richmond BK. A comparison of the laparoscopic vs robotic approaches for transanal minimally invasive surgery (TAMIS). *Am Surg.* 2025;91(9):1458-63.

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