Transanal Endoscopic Operation (TEO)

Dr. Kevin KK YAU

Consultant Surgeon, Department of Surgery, Pamela Youde Nethersole Eastern Hospital
Honorary Secretary, Hong Kong Society of Minimal Access Surgery

Background

In 2006, colorectal cancer has become the 2nd commonest cancer in Hong Kong. Despite significant advancement in surgical techniques and chemotherapeutic agents in the last decade, more than 40% of the patients still died from the disease. Moreover, there was an observed increasing trend of the disease in the last ten years (Figure 1).

Radical surgical operation is regarded as the good standard treatment for carcinomas of the rectum. A multicentre Dutch study has shown that a properly performed total mesorectal excision (TME) for T1-2, N0 tumours can achieve a local recurrence rate of less than 1%. However, TME is a major undertaking and can associate with significant morbidity and even mortality. In addition, the quality of life may be impaired in terms of bowel, bladder and sexual function disturbances.

In the past two decades, locoregional treatment for early rectal cancers has been advocated with much less morbidity and better functional outcomes. In certain groups of patients i.e. T1 rectal cancers with favourable characteristics, the oncological outcomes can actually be comparable to conventional radical surgery.

The advent of transanal endoscopic microsurgery (TEM) technique that was developed and described by Prof. Gerhard F. Buess in the early 80’s further flourished the use of locoregional treatment of early rectal cancers in the last 15 years.

TEM has been introduced into Hong Kong since 1995. Local experience also echoes the findings in those literature reviews. However, its clinical application in Hong Kong is still not popular. One of the possible reasons might be the expensive instruments that are required.

In the past decade, laparoscopic surgery was well established and equipped in most surgical units in Hong Kong. By simple modification, a new transanal resectoscope - Transanal Endoscopic Operation (TEO) was introduced by incorporating with readily available laparoscopic instruments to make it as effective and precise as compared with TEM.

Introduction

Transanal Endoscopic Operation (TEO) is a modification of the well established procedure - Transanal Endoscopic Microsurgery (TEM) which was first introduced by Professor Buess. This is a form of transanal excision for rectal tumours, either benign or malignant. A specially designed rectoscope (8 or 15cm in length, 4cm in diameter) incorporated with ordinary laparoscopic imaging system allows precise dissection under magnifying view. TEO is performed with constant carbon dioxide insufflation. High definition optics guarantee brilliant view and specific instrumentation allows precise dissection, full thickness resection and suturing of the defect. Furthermore, the more ergonomic operating position can save surgeons from occupational health hazards.

Experience from TEM in the treatment of early rectal cancers demonstrates that T1 cancers with good or moderate differentiation completely resected have recurrence rate of less than 5% and with a good chance for salvage radical re-operation. In experienced centres, the recurrence rate of adenoma is low (3-4%). There is a demonstration for the high preciseness of the procedure and much lower recurrence than after any other local procedure (recurrence rates after resection by using a retractor is around 30% in the literature).
TEO is well tolerated by patients with no external wound, less pain, less life-threatening complications and shorter hospital stay. Stoma is not required as the anal sphincter is saved.

**Indication of TEO**

**Early Stage Rectal Tumours**

TEO has emerged as an improved method of transanal excision of neoplasms because its enhanced visibility, superior optics, and longer reach permit a more complete excision and precise closure (Figure 4).

Proper case selection is mandatory for the success of TEO in the curative treatment of early rectal carcinomas. Endorectal ultrasonography allows very precise and accurate tumour and regional lymph node staging (Figure 5). Only patients with sonographic stage of T1, i.e. without invasion of muscularis propria, will be suitable for this procedure for curative intent. TEO treatment of T1 rectal cancers is safe and can achieve low local recurrence and high survival rates as compared with conventional local excisional surgery22-27.

**Large Villous Adenomas**

Large villous tumours frequently occur in the rectum and have a significant incidence of harbouring truly invasive carcinomas. The presence or absence of malignancy and its subsequent tumour staging can only be made by complete full thickness excision. Presence of invasive carcinoma on pathologic examination requires further surgical intervention appropriate for that diagnosis.

Recurrence depends on the technique used for tumour removal. It is highest for fulguration and local excision and lowest for operations that excise all or part of the rectum. Because most recurrences can be managed with local measures and the risk of malignancy in recurrences is relatively low, the procedure with which the tumour can be completely excised with the least morbidity should be used.

TEO allows full thickness excision with precision and the rectal defect can be closed with absorbable stitches (Figure 6). Most lesions in the mid and low rectum can be dealt with by this technique.

**Figure 3: Operative view of Transanal Endoscopic Operation. Noted the ergonomic position of surgeon and the clear endoluminal view.**

**Figure 4: Precise full thickness excision of early rectal cancer is important for the tumor T-staging.**

**Figure 5: Endorectal Ultrasound examination confirmed T1 early rectal cancer.**

**Figure 6: Large villous adenoma up to 7cm size was resected by TEO.**
Rectal Carcinoid Tumors

Rectal carcinoids are becoming more common. This is probably related to the increase use of colonoscopic examination for those patients who have lower gastrointestinal tract symptoms.

Endorectal ultrasonography is useful in determining the size and depth of penetration of the tumours and for detecting local lymph node metastases. Tumours of less than 10 mm in size that have not infiltrated the submucosa can be removed easily by TEO with curative intent. However, when invasion of lymph or blood vessels or lymph node metastases are found, radical surgery is still indicated.

Palliative Treatment for Advanced Rectal Carcinomas

Palliative treatment is important to improve the quality of life in patients with locally advanced or metastatic rectal tumours that preclude curative treatment. Stoma can temporarily relieve symptoms of intestinal obstruction. However, local symptoms such as tumour bleeding and tenesmus can be very frustrating. By using TEO, local excision of T2 or T3 tumours is possible in selected patients under regional anaesthesia (Figure 7) and can significantly relieve symptoms including obstruction, bleeding or tenesmus in the remaining life time of these terminal patients.

Extended Indication of TEO: Natural Orifice Transluminal Endoscopic Surgery (NOTES)

Laparoscopic colectomy has become more and more popular nowadays and some centres even take it as routine surgery for left side colonic tumours. However, specimen retrieval still necessitates a mini-laparotomy wound which may result in more wound related complications such as pain, bleeding and infection. Recently, our centre has published a new surgical technique of ‘Endo-Laparoscopic Colectomy’ without mini-laparotomy, where specimen retrieval and colorectal anastomosis can be safely achieved with the use of TEO device(32) (Figure 8). This technique is suitable for patients with tumour size less than 4cm in left side of the colon or upper rectum. Initial results are quite promising.

Conclusion

Although a formal government-led screening programme for colorectal cancers has not been promulgated in Hong Kong, people are now aware of the increasing trend in colorectal cancers through different media. More and more patients will prefer to have colonoscopy done when they get lower gastrointestinal tract symptoms. Consequently, more pre-malignant and small sized rectal lesions will be found. Among these patients, certain highly selected cases will definitely be benefited from TEO. Nevertheless, the author doesn’t believe that TEO will be the single panacea to solve all problems. We have different modalities of treatment options available nowadays: from medical to surgical treatment and from conventional open radical surgery to minimally invasive surgery. The most important point is to tailor-make our treatment strategy so that our patients can fully enjoy the benefit of the medical advancement in the new era. With this TEO device, both the surgeon and the patient are now given a choice!

References