

The Transsphincteric and Transsacral Approaches for the Surgical Excision of Rectal and Presacral Lesions

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Abstract: In the decade from 1981 to 1990, 30 patients underwent a posterior transsacral approach at the Aichi Medical University Hospital for their benign or malignant rectal lesions. The operation was classified into two procedures, consisting of the transsphincteric approach and transsacral approach, in order to cope with the condition of the anal sphincter muscles; whether they were divided or not. Eleven rectal tumors were successfully excised through the opened-up rectum by using the transsphincteric approach, and excellent results were obtained without any postoperative complications. Using the transsacral approach, 2 presacral dermoid cysts and 11 rectal lesions were easily removed under direct vision. Their prognoses were excellent. The transsacral approach was also applied for the resection of recurrent rectal cancers after a radical abdominoperineal resection in 6 patients suffering from intolerable local symptoms. All the patients were free from these uncomfortable local symptoms after the surgery. The posterior transsacral operation is thus considered to be of value not only for resecting benign rectal and presacral lesions, but also for resecting malignant rectal tumors in frail subjects who are unfit for radical operation and/or recurrent rectal cancer.

Key Words: transsphincteric approach, transsacral approach, rectal and presacral lesion

Introduction

Although a variety of techniques for rectal surgery have been advocated by many surgeons,^{1–3} there are still many complicated difficulties in providing adequate treatment of the rectal lesions, which are inevitably associated with the anatomical features of the anorectum and the nature of the lesions.

The lesions in the midrectum are especially inaccessible for local excision through the transabdominal and/or transanal approaches, which is often referred to as a notorious no man's land of surgical approach.⁴

The radical procedures of anterior resection⁵ or Mile's operation⁶ may be reasonably indicated for the treatment of advanced cancer, but these procedures may not be justified for benign lesions either because of the significant surgical risk or of the undesirability of colostomy.

The posterior approaches to the rectum provide adequate access for the complete local excision when an adequate exposure cannot be obtained by conventional approaches. The transsphincteric approach was first described by Bevan¹ in 1917, and Mason⁷ used this procedure enthusiastically for the extirpation of the rectal lesions with excellent results. The transsacral approach without an incision to the anal sphincter has also been used for a direct approach to the rectum.^{2,8} Although the extent of the direct exposure obtained by the transsacral approach is greatly limited in comparison to that by the transsphincteric approach, the approach is also applicable for the surgical treatment of primary presacral tumors and/or local recurrent rectal cancer following an abdominoperineal resection.

Although these posterior approaches are considered to have many advantages, these procedures have not yet been widely accepted because many surgeons fear the postoperative complications such as the fecal fistula, anal dysfunction and poor perineal wound healing.

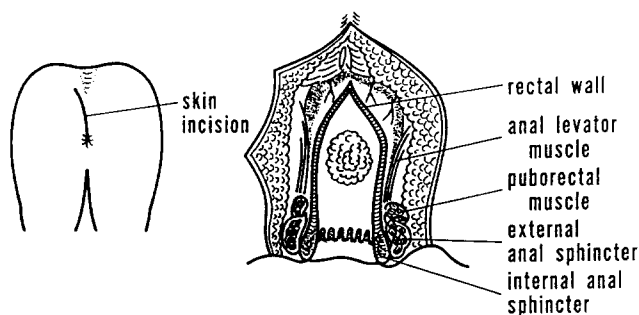
The present report describes the details of these procedures, and evaluates the results of the operations including the indications, complications and prognoses.

Patients and Methods

In the decade from January 1981 to November 1990, 30 patients were operated on at the Aichi Medical

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Transsphincteric Approach



Transsacral Approach

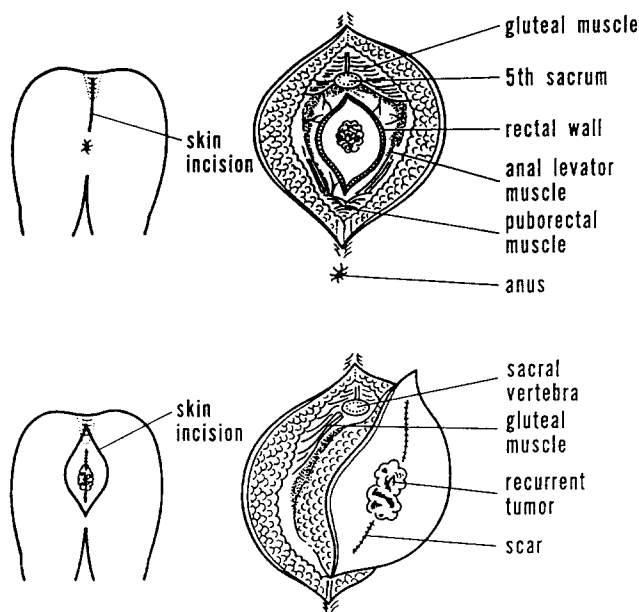


Fig. 1. Posterior transsacral operation — transsphincteric approach

University Hospital by using either transsphincteric or transsacral approaches.

There is still considerable debate as to the nomenclature of the posterior transsacral approach because various authors have attached their own name to the operative procedures.^{1,2} In this paper, the operative procedures are classified into the transsphincteric approach and transsacral approach, based on whether the anal sphincter muscles are divided or not.

The method of the transsphincteric approach is almost same as that described by Bevan¹ and Mason⁷ as shown in Figs. 1 and 2. The patient is placed in the jackknife position. The buttocks are strapped apart, and the skin is prepared in the usual manner.

A curvilinear longitudinal skin incision is made from the fifth sacral vertebra down to the anal verge. The incision is carefully deepened to expose the anococcygeal ligament, anal levator muscles, puborectal muscle and

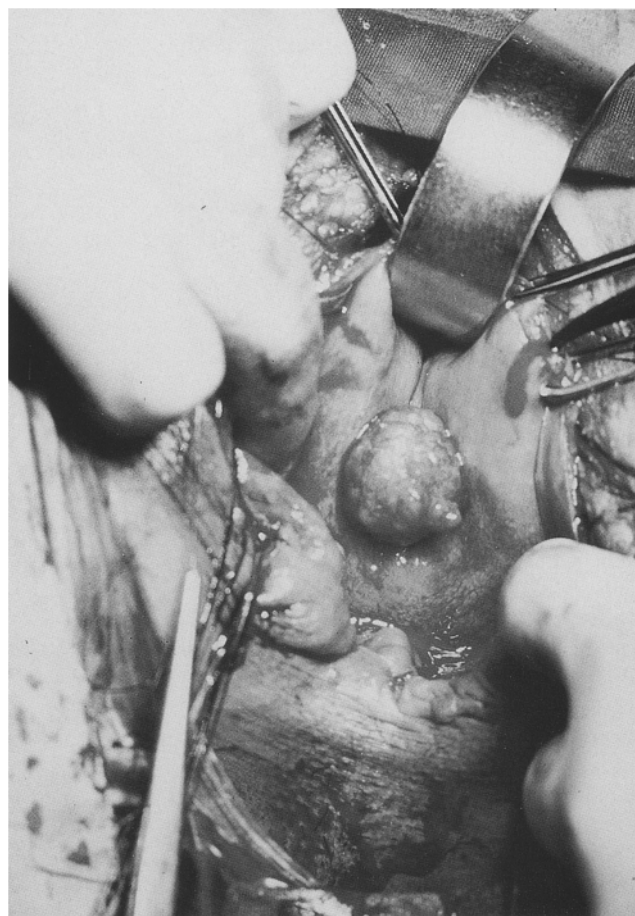


Fig. 2. Villous adenoma of the midrectum is completely exposed by the transsphincteric approach

external anal sphincter muscles. The anal levator muscles are detached from the coccyx and a coccygectomy is performed. The anal levator muscles are divided in the midline, exposing the presacral space and posterior wall of the rectum. The rectal wall is carefully mobilized to allow for an adequate localization of the lesion. The puborectal muscle and external anal sphincter muscle are divided along with the posterior midline. The posterior rectal wall is longitudinally incised from the internal anal sphincter muscle to an adequate proximal level above the rectal lesion, as shown in Fig. 2. Each incised muscle end is carefully marked by stay sutures to facilitate a precise repair of the wounds.

With the entire exposure of the rectum, the lesion can be completely excised including an adequate amount of the surrounding healthy tissue. The resulting defect of the rectal wall is approximated with interrupted Gambee's one-layer suture using absorbable suture material. The longitudinally-incised posterior rectal wall and internal anal sphincter are carefully closed with Gambee's one-layer suture using alternating Vicryl (Ethicon Ltd., Peterborough, Canada) and Surgilon

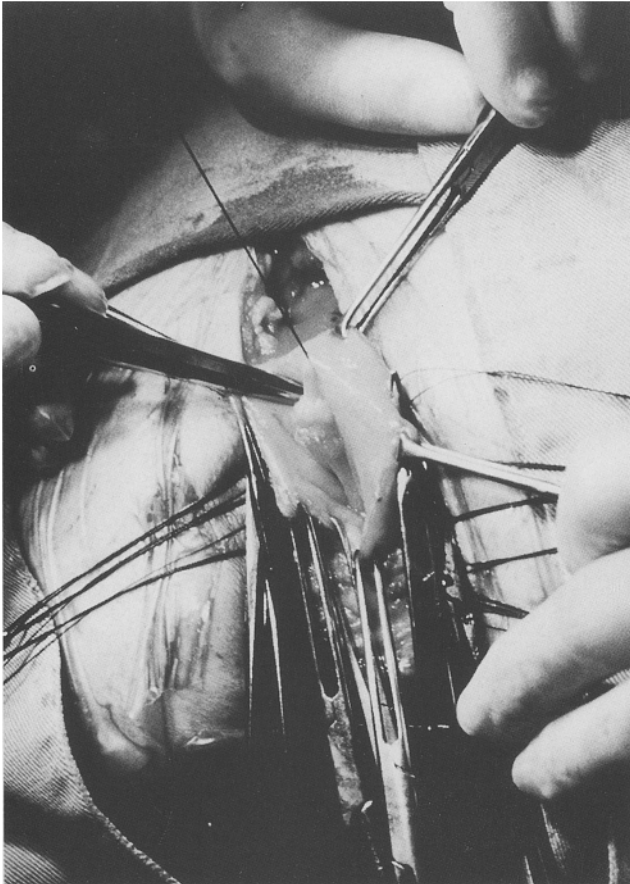


Fig. 3. This villous adenoma with focal cancer is exposed by the transsacral approach

(Cyanamid Medical Device Co., Seoul, Korea). The incised anal sphincter muscle bundle is reapproximated by an interrupted suture, and the posterior midline incision of the anal levator muscles is also closed. The skin is then closed with a vertical mattress suture. Portovac suction tubes (Shannon Ind., Clare, Ireland) are placed in the retrorectal and subcutaneous space, respectively.

The transsacral approach for the treatment of rectal and/or presacral tumors is shown in Figs. 1 and 3, and a skin incision is made from the fifth sacral vertebra to the proximal edge of the external anal sphincter. The exposures of the presacral space and the posterior rectal wall are similarly performed as in the transsphincteric approach. The presacral tumor is carefully dissected from the surrounding tissue, and is completely removed under direct vision.

For the removal of the rectal lesion, the rectum is freed more thoroughly from the surrounding pelvic wall, and the lesion is dissected under direct vision similarly as described in the transsphincteric approach, except without any division of the anal sphincter.

The surgical procedure for the resection of the local recurrent rectal cancer is shown in Fig. 1. A spindle-shaped skin incision is made on the buttocks with an adequate wide margin of the normal tissue, from the third sacral vertebra to the base of the scrotum for men (just above the urethral orifice of the vestibulum vaginalis for women). As shown in Fig. 4, the incision is deepened to expose the lower sacrum, coccygeus, both greater gluteal muscles, and the posterior urethral duct.

At first, a coccygectomy is performed and the tumor mass is dissected free from the presacral space, but if necessary, either the fifth or fourth sacral vertebra is

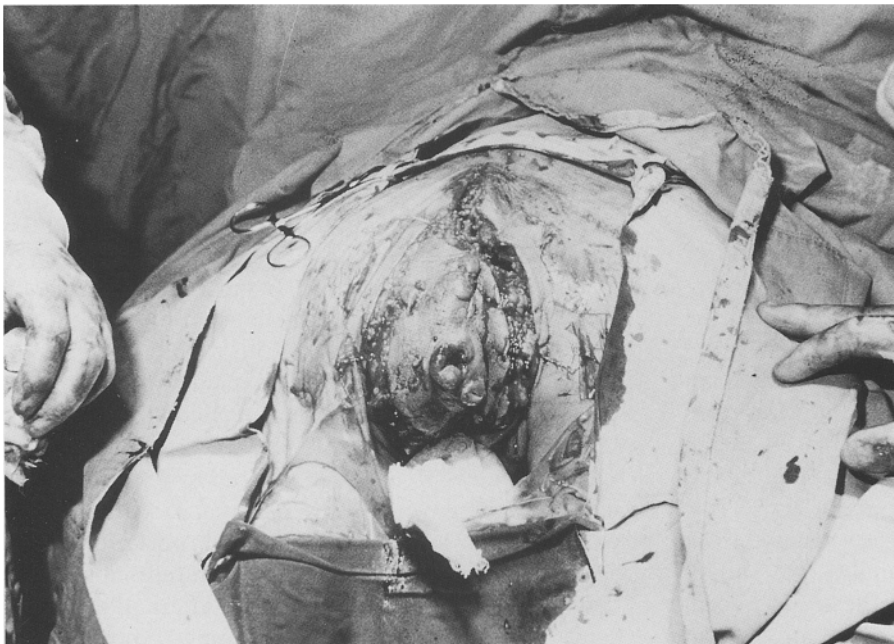


Fig. 4. Excision of the tumor including the surrounding normal tissues was made by the transsacral approach

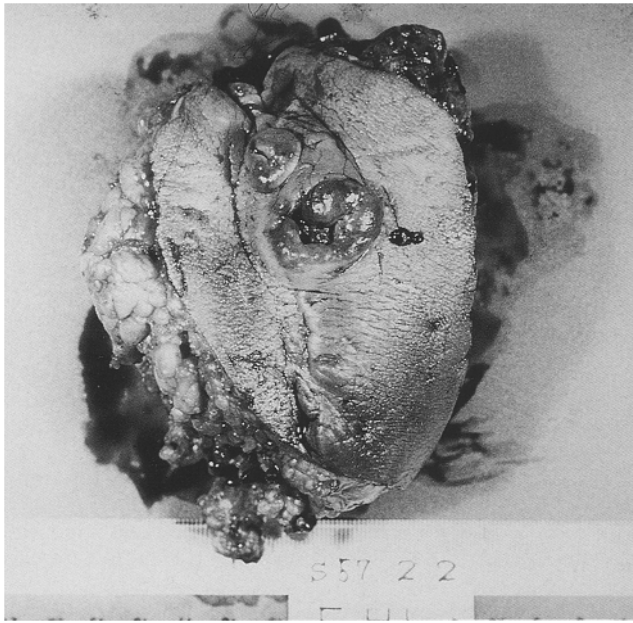


Fig. 5. The en bloc dissected specimen of locally-recurrent rectal tumor using the transsacral approach

removed. The anal levator muscles are incised along the median edge of the greater gluteal muscles, then a lateral dissection is deepened toward the urethral duct. At the posterior dissection, the indwelling catheter in the bladder is a convenient marker for the urethral duct. The tumor mass is dissected free from the urethral duct and prostatic gland. When the tumor mass is almost mobilized from the pelvic wall, it is pulled out and

carefully dissected from the pelvic floor, while not damaging the intestine. A complete en bloc excision of the tumor mass is shown in Fig. 5.

In order to close the wound, the greater gluteal muscles are laterally freed and sutured to each other. The skin is also primarily sutured and Portovac catheters are left in the resulting pelvic cavity and subcutaneous layer, respectively.

Results

The ages of the 30 patients ranged from 17 to 86 years, and the sex distribution consisted of 17 males and 13 females. Transsphincteric approaches were performed in 11 patients for excision of the rectal lesions. For the remaining 19 patients, a transsacral approach was performed as the primary surgery for the cure of rectal and presacral lesions in 13, and as a surgical resection for the recurrent perineal rectal tumor after a radical abdominoperineal resection in 6.

The clinico-pathological findings on the 11 patients treated by the transsphincteric approach are summarized in Table 1. All the lesions consisted of 4 benign tumors and 7 malignant tumors. The lower-most extensions of these tumors were located from 5 cm to 9 cm from the anal verge with an average of 6.5 ± 1.5 cm, and their sizes ranged from 0.7 to 4.5 cm in the widest diameter.

The four benign tumors included sessile villous adenoma in 2 and carcinoid tumor in 2, which were submucosally excised. The indications for this approach

Table 1. Clinical data in patients with the transsphincteric approach

No.	Age	Sex	Disease	Distance from anal verge (cm)	Size (cm)	Resection	Preoperative complications	Postoperative complications	Prognosis
1	59	M	Villous adenoma	8	4.5 × 4	Submucosal	—	—	Healthy 8 years 9 months
2	49	M	Villous adenoma	9	2.5 × 2.5	Submucosal	—	—	Healthy 8 years 8 months
3	82	M	Villous carcinoma (PM)	7	4 × 4	Transmural	Apoplexy	—	Healthy 7 years 4 months
4	79	M	Advanced carcinoma	9	2.5 × 2	Transmural	Hemiplegy Apoplexy	—	Dead 1 year 11 months
5	54	F	Advanced carcinoma	6	2 × 1.7	Transmural	Pul. emphysema Liver Meta	—	Dead 2 years 4 months
6	73	F	Villous carcinoma (SM)	7	1.5 × 1.5	Transmural	Diabetes mellitus Cardiac disease	—	Healthy 6 years 4 months
7	42	M	Carcinoid	6	1.2 × 1	Submucosal	—	—	Healthy 5 years 10 months
8	71	F	Villous carcinoma Focal carcinoma	5	1.5 × 1.5	Transmural	Cardiac disease Apoplexy	—	Healthy 5 years
9	37	M	Carcinoid	5	0.7 × 0.7	Submucosal	—	—	Healthy 4 years 10 months
10	58	F	Villous carcinoma (M)	5	4.5 × 3	Transmural	—	—	Healthy 4 months
11	86	F	Adenocarcinoma	5	3 × 2.5	Transmural	—	—	Healthy 2 months

PM, Proper muscle; SM, submucosa; M, mucosa; Pul., pulmonary; Meta., metastasis

Table 2. Clinical data in 13 patients with the transsacral approach for rectal and presacral lesions

No.	Age	Sex	Disease	Location & Distance from anal verge (cm)	Size (cm)	Resection	Pre- and postop. complications	Prognosis
1	52	F	Dermoid cyst	Presacral	5 × 4	Extirpation	n.p.	Healthy 9 years 1 month
2	17	F	Dermoid cyst	Presacral	3 × 2.5	Extirpation	n.p.	Healthy 8 years 7 months
3	83	F	Villous carcinoma (M)	Ra, 10	2.5 × 2	Transmural	Decrepit (pre)	Healthy 6 years 7 months
4	63	F	Carcinoid	Rb, 5	1 × 0.7	Submucosal	n.p.	Healthy 6 years 6 months
5	55	M	Ulcer	Rb, 6	1.5 × 1.5	Transmural	n.p.	Healthy 6 years 6 months
6	70	F	Adeno carcinoma (PM)	Ra, 10	3 × 2	Transmural	Myocard. insuff. (pre)	Healthy 4 years 6 months
7	36	M	Carcinoid	Ra, 12	1 × 1	Submucosal	n.p.	Healthy 3 years 5 months
8	59	F	Adeno carcinoma (SM)	Ra, 8	1.8 × 1.6	Transmural	n.p.	Healthy 3 years 2 months
9	74	M	Villous adenoma	Ra, 8	2 × 1.8	Submucosal	Decrepit (pre)	Healthy 3 years
10	44	M	Rectal injury	Rb, 6	4 × 3	Closure	n.p.	Healthy 2 years 5 months
11	71	M	Villous adenoma	Ra, 10	4 × 4	Transmural	n.p.	Healthy 2 years 4 months
12	55	M	Villous carcinoma (M)	Ra, 10	4 × 3	Transmural	Renal insuff. (pre)	Healthy 2 years
13	63	M	Villous adenoma	Ra, 10	3 × 2	Submucosal	n.p.	Healthy 2 years

Ra, upper rectum; *Rb*, lower rectum; *n.p.*, no particular complications; *Pre*, preoperative

was that they could not be managed by the conventional operative procedures such as a transanal excision, endoscopic polypectomy, and/or a transabdominal local excision.

The seven malignant lesions consisted of four villous adenocarcinomas, two advanced cancers, and one early cancer. The four malignant villous tumors were carcinoma in situ in two, invasion to submucosa in one, and invasion to the propria muscle in one. The two advanced cancers had severe rectal bleeding, and one of them was associated with multiple liver metastasis while the other had apoplexy and severe pulmonary emphysema. The other 86-year-old patient with rectal cancer invading submucosa was in senile decrepitude.

In these malignant tumors, wedge-shaped full-thickness dissections were performed in five and palliation in two. No postoperative complications were observed and full anal continence was restored. Their prognoses were excellent except for two patients with palliative surgery, one of whom died of cardiac arrest at the postoperative 23rd month, and another who died at the 28th month due to liver metastasis.

The clinical data on the 13 patients treated by the transsacral approach for primary rectal and presacral lesions are shown in Table 2.

The two presacral dermoid cysts markedly displaced the rectum anteriorly as shown in Fig. 6, and were completely excised under direct exposure.

The two benign rectal carcinoid tumors were submucosally excised together with a part of the propria muscle. Three benign villous adenomas were submucosally excised in two, and transmurally excised in one. However, the wedge-shaped dissection of an involved bowel with full-thickness was performed in two patients with a non-specific ulcer and a traumatic perforation in one each. This wedge-shaped dissection was also applied for the treatment of four malignant tumors which were villous adenoma including carcinoma in situ in two, small nodular adenocarcinoma invading the submucosa in one, and the propria muscle in one. All these tumors were located from 5 to 12 cm from the anal verge with an average of 8.6 ± 2.2 cm, and were some 2 cm proximal from those for which the transsphincteric approach was selected. Their diameters ranged from 1 to 4 cm at the widest point. All prognoses have been excellent without any postoperative complications.

The results of the six patients with locally recurrent rectal cancer treated by the transsacral approach are shown in Table 3. The duration of their recurrences

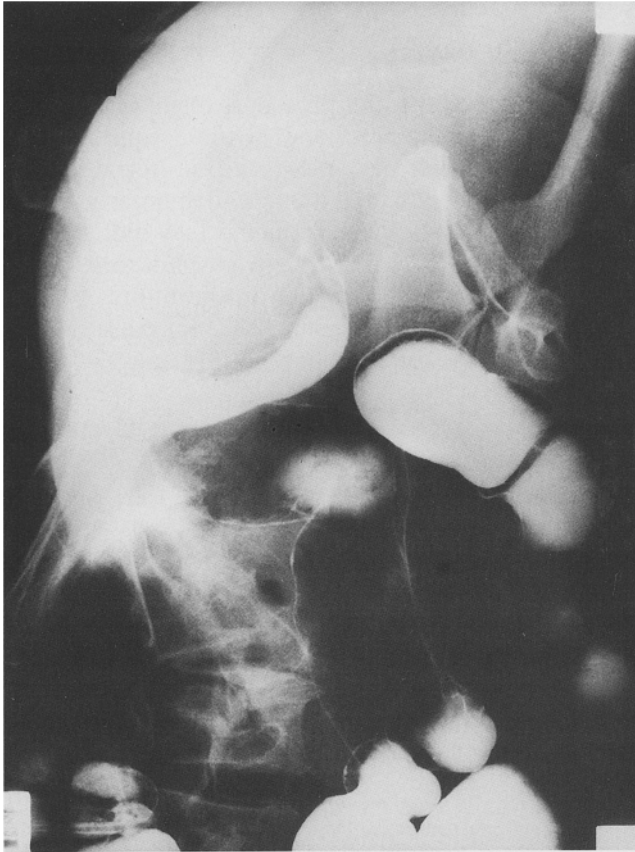


Fig. 6. Barium enema shows that the rectal wall is markedly compressed due to the presacral tumor

were relatively short after primary operations, ranging from 10 to 20 months. The radical operations included five cases of abdominoperineal dissection of the rectal cancers, and a total proctocolectomy of a familial polyposis coli.

All the patients had uncomfortable symptoms arising from the locally recurrent tumors such as severe pain,

swelling, and discharge from the cutaneous fistula in the perineal region associated with contamination. In addition to this, four of them also had liver metastasis. Although all the patients had been treated with chemotherapy, combined with radiation therapy in three patients, no improvement in the local symptoms was observed. As shown in Fig. 5, an en bloc dissection of the tumors with the surrounding normal margin and coccygectomy was performed, and a resection of the lower sacral vertebra was done in the four patients.

Minimal postoperative complications were observed in three patients, who had wound dehiscence in one and transient dysuria with wound infection in two. All the patients enjoyed a normal life after the surgeries without any local symptoms.

All the six patients died of disease at the 10th, 11th, 12th, 24th and 56th postoperative months, respectively, but one of them did not have any evidence of the disease at the postoperative 44th month and was able to continue his normal employment and family life.

Discussion

The posterior approach for the treatment of rectal cancer was first described by Kraske in 1885. Due to the high recurrence rate and incidence of fistula formation, this procedure was abandoned when Miles introduced abdominoperineal resection in 1908.⁶ Bevan advocated the transsphincteric approach which had good results for the treatment of small rectal cancers.¹ In 1951, Crowley performed the transsacral approach which provided a good exposure for rectal villous adenoma.⁸ Several authors revived these procedures for the treatment of villous tumors in the rectum, because the proctoscopic and transanal resections were frequently associated with a high recurrence rate, and unreliable diagnoses with fractional biopsies are well documented.

Table 3. Clinical data in six patients with a transsacral resection of local recurrent tumors

No.	Age	Sex	Initial operation	Recurrent duration	Local symptoms	Liver meta.	Resected specimen (cm)	Complications	Prognosis
1	57	M	Miles Rectal carcinoma	1 year	Pain, swelling soiling, fistula	+	11 × 6 × 6.5 Coccygectomy	Wound dehiscence	Dead 2 years
2	43	F	Miles Rectal carcinoma	10 months	Pain, swelling fistula, soiling	+	15 × 10 × 7 Coccygectomy	n.p.	Dead 11 months
3	37	M	Total proctocolectomy Familiar polyposis coil	1 year 9 months	Pain, swelling fistula, soiling	-	11 × 8 × 7 S5 + Coccygectomy	n.p.	Dead 4 years 8 months
4	45	F	Miles Rectal carcinoma	1 year 10 months	Pain, swelling	+	10 × 7 × 5 S5 + Coccygectomy	n.p.	Dead 2 years
5	62	M	Miles Rectal carcinoma	1 year 10 months	Pain, swelling fistula, soiling	+	12 × 6.5 × 6 S5 + Coccygectomy	Dysuria, infection	Dead 1 year
6	60	M	Miles Rectal carcinoma	1 year 10 months	Pain, swelling fistula	-	16.5 × 9 × 6.5 S5 + Coccygectomy	Infection	Dead 10 months

S5, 5th sacral segment; *Meta.*, metastasis

These unfamiliar approaches have been generally considered to have frequent association of hazardous complications such as anal dysfunction and/or fecal fistula formation, so that they are still not widely accepted for rectal surgery.

The indications for the transsphincteric approach has been markedly expanded by Mason,⁷ who used this approach not only for the treatment of benign rectal lesions such as vesicorectal fistula and villous tumor, but also for local excision of rectal cancer.

Mason's concept was confirmed by our results that this approach was not only a useful procedure for benign rectal lesions which cannot be adequately managed by conventional procedures, but is also applicable for local excision of rectal cancer in patients who are considered unsuitable, either physically or mentally, for a radical abdominoperineal resection and anterior resection.

The transsphincteric approach is more effective and desirable for a direct exposure to the rectum than the transsacral approach, but this transsacral approach can also be applied for the treatment of presacral tumors. In our series, two presacral dermoid cysts were easily removed by this approach.

Localio et al.⁹ have used this approach for a radical excision of the rectal cancer, in which coloproctostomy is accurately performed under direct vision.

Although the incidence of local recurrences has been relatively high among patients who underwent radical resection of rectal cancers by the abdominoperineal route, these recurrent tumors have not been generally considered to be amenable to surgical resection. Consequently, they have been usually treated by irradiation and/or chemotherapy, which have only a transient palliative effect.

Recently, Wanebo and Marcove¹⁰ and Takagi et al.¹¹ performed an en bloc excision of these recurrent tumors

with a dissection of the lower sacrum and adequate pelvic wall by using both transsacral and abdominal approaches.

They reported that this procedure might thus provide good palliation in most and possible cure in some patients. In our cases, the recurrent rectal tumors were only resected by the transsacral approach, but we obtained almost the same results as they did.

Based on these findings, the transsphincteric and/or transsacral approaches should, in the future, be considered to have a much greater value for the surgery of rectal and/or presacral lesions.

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