Parks' Coloanal Sleeve Anastomosis for Treatment of Postirradiation Rectovaginal Fistula

MAREK P. NOWACKI M.D., D.SC., ANDRZEJ W. SZAWLOWSKI M.D., ANDRZEJ BORKOWSKI M.D., D.SC.

Nowacki MP, Szawlowski AW, Borkowski A. Parks' coloanal sleeve anastomosis for treatment of postirradiation rectovaginal fistula. Dis Colon Rectum 1986;29:817-820.

Postirradiation rectovaginal fistula is a complex problem in colorectal surgery. The modified Parks procedure curettage of rectal mucosa heavily damaged by radiation is introduced. Fifteen cases of coloanal sleeve anastomosis for the repair of rectovaginal postirradiation fistula are described. All patients previously were irradiated heavily because of carcinoma of the uterine cervix. Three patients had simultaneous repair of vesicovaginal fistula. One postoperative death was observed. Of the surviving patients, functional results have been good in 11. In the seven patients with difficult stripping of the rectal mucosa, surgical curettage was performed. The latter procedure is suggested as the method of choice in relevant cases. [Key words: Parks' coloanal sleeve anastomosis; Postirradiation fistula; Surgical closure of rectovaginal fistula.]

RADIOTHERAPY FOR THE treatment of carcinoma of the uterine cervix may result in severe damage to adjacent organs and, in 0.3 to 6 percent of patients, may advance toward formation of a rectovaginal fistula.[1-3] Frequently, only permanent, proximal colostomy was offered for such a condition, satisfying neither patient nor doctor. Until recently, several methods have been used to manage this complication. Some authors proposed local repair and[1,4] others pull-through procedures.[5-7]Poor functional results and relatively high postoperative complication rates (recurrence of fistula, bowel necrosis, stenosis), however, attracted some skepticism regarding the efficiency of those methods.[8,9] In 1978, Parks et al.[10] reported the first five cases of postirradiation rectovaginal fistula cured successfully with good functional results. Parks creatively adopted the technique of coloanal sleeve anastomosis, which initially was described in 1947 by Ravitch and Sabiston[11] for surgical treatment of multiple adenomatosis coli. In the last decade, few reports were published on the problems of surgical treatment of postirradiation rectovaginal fistula.[10,12,13] In 1979 and 1981, Bricker et al.[12,13] described their experience with the colorectal patch procedure. Cooke and DeMoor,[2] Borkowski and Nowacki,[14] and Gazet[3] reported encouraging results with Parks' technique for the treatment of various postirradiation complications (proctitis, rectovaginal and vesicovaginal fistulas, and rectal stricture). Many aspects of the therapeutic approach need further elaboration and improvement, because the number of patients treated successfully is still below 100. We describe our experience with Parks' procedure in the treatment of rectovaginal fistula, and introduce a slight modification of the procedure for heavily damaged rectal mucosa.

Received for publication March 4, 1986.

Address reprint requests to Dr. Nowacki: Cancer Center, ul. Wawelska 15, 02 034 Warszawa, Poland.

From the Department of Surgical Oncology, Cancer Center, Maria Sklodowska-Curie Memorial Institute, and the Department of Urology, Medical University School of Medicine, Warsaw, Poland.

Patients and Methods

From 1980 to 1984, Parks' coloanal sleeve anastomosis for the treatment of rectovaginal fistula was performed on 15 patients. All had been irradiated to treat carcinoma of the uterine cervix. Clinical data are summarized in Table 1. Ages ranged from 28 to 61 years (median, 45 years). Rectovaginal fistula was diagnosed six to 157 months following radiotherapy (median, 17 months) and sizes ranged from 1 to 6 cm (median, 3 cm). In ten patients, the fistula was located 3 to 5 cm above the anal orifice. Before surgery, all patients were evaluated carefully to exclude recurrent disease and confirmed by tissue biopsy. If necessary, urine cultures, intravenous pyelography, ultrasono-

TABLE 1. *Clinical Data on 15 Patients Undergoing Surgery for Postirradiation Rectovaginal Fistual*

Patient Number	Age (Years)	Cervical Cancer (FIGO)	Initial Treatment	Radiation Dose in the Rectum (rads)	Fistula Months after Radiotherapy	Distance from the Anal Orifice (cm)	Size (cm)	Associated Condition
1	42	I	Ra + Co^{60}	8000	17	3	5	Stricture
2	49	I	Cs^{137} + surgery	5100	10	5	4	Vesicovaginal fistula
3	61	II	Ra + Rtgth	8200	18	5	4	—
4	44	IIab	Ra + Co^{60}	8500	16	5	1.5	—
5	48	Ib	Cs^{137}	9000	8	2	5	Stricture
6	45	IIab	Ra + Rtgth	8250	20	6	2	—
7	38	IIa	Ra	5500	15	3	6	Stricture
8	56	IIa	Cs^{137} + Co^{60}	9740	17	3	3	Frozen pelvis
9	39	Ib	Ra + Co^{60}	8770	21	6	2	—
10	59	I	Rtgth + Ra	7450	157	5	1	Stricture
11	55	III	Ra + Rtgth	?	36	3	3	Frozen pelvis
12	28	I	Ra + Rtgth	?	14	6	3	—
13	45	I	Surgery + Co^{60} + Ra	?	12	2	3	Vesicovaginal fistula
14	32	Ib	Surgery + Co^{60} + Ra	12040	6	5	5	Vesicovaginal fistula
15	43	Ib	Co^{60} + Ra	8430	28	4	2	—

graphy, chest x-rays, liver imaging, and cystoscopy were performed.

The treatment was staged (Table 2). Initially, diverting loop colostomy was done. All patients treated in our institution had right transverse colostomy. Next, after four to eight weeks, which are necessary for reduction of sepsis and edema of the distal bowel, Parks' procedure was performed. Before surgery the bowel was prepared in a standard manner: low residue and clear liquid diet for three to four days, cleansing enemas 24 hours before surgery, and antibiotics preoperatively (erythromycin + neomycin 3 gm each for two days) or perioperatively (Amikin™ 500 mg + metronidazole 500 mg intravenously 1 hour before surgery). Patients were operated on in the lithotomy (Lloyd-Davies) position. The abdomen was prepared with 0.5 percent chlorhexidine gluconate in 70 percent ethanol, and was entered through a midline incision extending about 5 cm above the umbilicus. The left side of the colon, including the splenic flexure, was mobilized fully to obtain bowel long enough to be pulled down to the dentate line without tension. The rectum was mobilized only to the level of the fistula, and was divided at this point. Next, an attempt was made to strip the rectal mucosa, as described by Parks. In seven cases, however, (Patients 5, 9, 10 and 12 to 15) it was impossible to perform this part of the procedure because of radiation damage to the rectal wall. In such situations gynecologic curettes of various sizes (8 to 12 mm) were used to remove mucosa. Bleeding was stopped by cautery and application of warm saline packs. Occasionally Surgicel™ or Collastypt® were used for a few minutes as a pressure dressing. If stricture and/or rigid rectal wall were present, the muscular cuff was enlarged by sharp anterior wall incision. Next, the mobilized colon was pulled through the anus until the apparently healthy, nonirradiated, and well-vascularized segment was seen at the level of the dentate line. At that time, attention was focused on proper positioning of the bowel in a small pelvis to cover the fistula with appendices epiploicae and/or pericolonic fat. Coloanal anastomosis was performed using four to six interrupted 3-0 Dexon™ or coated Vicryl® sutures. Sutures were placed through all layers of the bowel wall and anal sphincters, and tied carefully to avoid ischemia. Finally the proximal colon was fixed to the upper border of the rectal stump by four Dexon 2-0 sutures to avoid retraction and ensure proper positioning. The small pelvis was drained only occasionally when difficult hemostasis was encountered (two patients). The average time for the procedure did not exceed four hours, and the estimated blood loss did not exceed 500 ml. Postoperatively, all patients were kept on intravenous fluids until Day 4 or Day 5, when normal bowel function was noted. Antibiotic coverage was used for seven days, and consisted of gentamicin, 80 mg, and metronidazole, 500 mg intravenously every 8 hours. In 14 of 15 patients the postoperative course was uneventful and the hospital stay ranged from 14 to 18 days (median 17 days).

TABLE 2. *Stages of Surgical Treatment*

Stage	Point in Time
Diverting loop colostomy (right transversostomy)	—
Parks' procedure	4 weeks post-colostomy
Colostomy closure	3 months post-colostomy

The diverting loop colostomy was closed three months later, after healing assessment. After that time, clinical and endoscopic examination usually showed the fistula site to be filled with granulation tissue, followed by sub-

sequent epithelialization. Radiologic contrast studies were done in eight of 14 patients to exclude residual fistula before colostomy closure.

Results

One patient died postoperatively (mortality rate 6.7 percent) due to diffuse peritonitis and septic shock. All remaining patients were followed every two to three months within the first postoperative year, and every six months thereafter. Postoperative observation ranged from 13 to 70 months (median, 38 months). Functional results (Table 3) were assessed by patient interviews, rectal digital examination, and vaginoscopy. Eleven patients (78.6) returned to normal bowel habits with complete relief of symptoms (bleeding, pain, tenesmus). There were three failures: two of these patients developed recurrent microfistulas but are continent for feces. They complain of occasional soiling but are satisfied with the results. The remaining patient (Patient 8) developed recurrent rectovaginal fistula, which healed 28 months later. She is living with her colostomy and has refused further treatment.

Some degree of stricture of coloanal anastomosis was observed among all patients. In only two patients with microfistulas was digital and instrumental dilatation of the stricture needed every two to six weeks within the first postoperative year to assure proper defecation. One of the two patients required surgical intervention. Under epidural anesthesia, incision of the scar and biopsy of granulation tissue was performed. Microscopic examination did not reveal tumor recurrence.

TABLE 3. *Functional Results of Treatment*

Patient Number	Results
1	Good*
2†	Good
3‡	Failure
4	Good
5	Good
6§	—
7	Good
8	Failure
9	Good
10‡	Good
11	Failure
12	Good
13†	Good
14†	Good
15	Good

*Good: restoration of fecal continence and return to normal bowel movements.

†Simultaneous repair of vesicovaginal fistula.

‡Vesicovaginal vistula 3 to 12 months later.

§Postoperative death.

Discussion

The frequency of postirradiation rectovaginal fistula ranges from 0.3 to 6 percent in the world literature, whereas in Poland it is 0.9.[1-3,15] Most patients are in their active middle years. They are cured from malignancy but suffer extremely from complications of radiotherapy. The most dramatic are vesicovaginal and rectovaginal fistulas. Fistula formation results from interaction of three basic factors: 1) ionizing radiation, 2) fecal stream, and 3) bacterial flora.[16] These factors influence the policy of surgical repair of radiation-induced damage:[10]

1. The fistula must be covered by tissue unaffected by radiation,
2. Rectal mucosa must be removed to eliminate the source of symptoms and the possibility of radiation-induced carcinoma,
3. The surgical technique should be simple, avoiding manipulation of the radiation-damaged tissue,
4. The anal sphincters should be unaffected by radiation and surgery.

Our experience supports the published data.[2,3,10] Parks' coloanal sleeve anastomosis is a reliable procedure for the surgical repair of rectovaginal fistula. Functional results were good and comparable with those reported by others.[2,3,10,12,13] We did three synchronous repairs of the vesicovaginal and rectovaginal fistulas. A similar experience has not been reported in the literature, except for our own case published earlier.[14] Two of our patients developed vesicovaginal fistulas during follow-up three and 12 months after Parks' procedure. The latter observation supports our contention that our clinical material was probably much more irradiated than in the series of others. In our series, removal of the rectal mucosa was impossible in seven of 15 patients; therefore, we used an unconventional method of curettage, that was not described in the literature.

Conclusion

The modified standard Parks' procedure (curettage of the rectal mucosa) is the method of choice in the repair of rectovaginal fistulas in patients with difficult stripping of rectal mucosa that has been damaged heavily by radiation.

References

1. Graham JB. Vaginal fistulas following radiotherapy. Surg Gynecol Obstet 1965;120:1019-30.
2. Cooke SA, DeMoor NG. The surgical treatment of the radiation-damaged rectum. Br J Surg 1981;68:488-92.
3. Gazet JC. Parks' coloanal pull-through anastomosis for severe, complicated radiation proctitis. Dis Colon Rectum 1985;28: 110-4.
4. Martius H. Fettlappenplastik aus dem Bulbokavernosusgebiet als Fistelnahtschutzoperation. Geburtsh Frauenh 1940;2:453-9.

5. Ingelman-Sundberg A. Eine Methode zur Operativen Behandlung von vesicovaginalen und Rectovaginalen Fisteln im Bestrahlten. Arch Gynekol 1953;183:498-500.
6. Bastiaanse MA, Van B. Bastiaanse's method for surgical closure of very large irradiation fistulae of the bladder and rectum. In: Youssef AF, ed. Gynecological urology. Springfield, IL: CC Thomas, 1960:281.
7. Thomford NR, Smith DE, Wilson WH. Pull-through operation for radiation-induced rectovaginal fistula: report of a case. Dis Colon Rectum 1970;13:451-3.
8. Brintnall ES. Surgical treatment of postirradiation rectal stricture and rectovaginal fistula. Arch Surg 1953;67:346-52.
9. Goligher JC. Surgery of the anus, rectum, and colon. 5th ed. London: Baillière Tindall, 1984:673-84.
10. Parks AG, Allen CL, Frank JD, McPartlin JF. A method of treating post-irradiation rectovaginal fistulas. Br J Surg 1978;65:417-21.
11. Ravitch MM, Sabiston DC, Jr. Anal ileostomy with preservation of the sphincter: a proposed operation in patients requiring total colectomy for benign lesions. Surg Gynecol Obstet 1947;84: 1095-9.
12. Bricker EM, Johnston WD. Repair of postirradiation rectovaginal fistula and stricture. Surg Gynecol Obstet 1979;148:499-506.
13. Bricker EM, Johnston WD, Patwardhan RV. Repair of postirradiation damage to colorectum: a progress report. Ann Surg 1981;193:555-64.
14. Borkowski A, Nowacki M. Simultaneous repair of post-irradiation vesicovaginal and rectovaginal fistulas. J Urol 1982;128:926-8.
15. Szawlowski A. Popromienna przetoka pochwowo-odbytnicza (fistula rectovaginalis postradiologica): problem kliniczny. Nowotwory 1984;34:213-21.
16. Friedman NB. Pathogenesis of intestinal ulcers following irradiation: effects of colostomy and adhesions. Arch Pathol 1955;59:2-4.

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