

## Surgical Outcome of Female Genital Fistula in Korea

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This purpose of this study was to establish a new standard for the surgical management of female genital fistula in Korea. From January 1992 to October 2001, 117 patients with female genital fistula who were admitted to the departments of obstetrics and gynecology, urology and general surgery were analyzed. Nine patients with congenital etiologies and 48 patients who were treated conservatively were excluded. The relationships between surgical outcome and the cause of fistula, the location of fistula, and the various surgical methods were analyzed. In spite of appropriate surgical treatment, fistulas due to cervix cancer management had the worst prognosis. In terms of location, fistula recurrence after surgical repair was most common in the bladder fundus and base. The transvaginal and transrectal approaches are suitable for fistulas located in the lower vagina. The transabdominal approach is appropriate for fistulas located in the functional portions such as the bladder and ureter, for fistulas which are difficult to expose surgically by either the vaginal or rectal approach, or in cases with severe adhesions. In cases of cervix cancer, extra care should be taken during surgical expiration or definitive radiotherapy, especially when the areas involved are the bladder fundus and base. The nature of the surgical approach should be decided by the location of the fistula, the functional importance of the area, and the degree of surgical exposure during the corrective procedures.

**Key Words:** Female genital fistula, surgical treatment

### INTRODUCTION

The incidence of fistula in the female genital tract has recently been on the rise, due to the increasing application of radical surgical and radiotherapeutic treatments of the female repro-

ductive system. The treatment of female genital fistula is divided into conservative non-surgical expectant therapy and definitive surgical treatment. The surgical treatment can be divided into transabdominal and transvaginal methods according to the method of approach. However the operative correction leads to success in various degrees, and an analysis of the success rate according to the lesion site and approach method is needed. Only then will it be possible for surgeons faced with the difficult problem of fistula in the female genital tract to choose the most appropriate method of treatment on an individual basis.

The causes of genital fistula in developing countries are quite different from those in Western countries. In developing countries, the causes are prolonged labor, instrumental delivery and other complications related to delivery, with the majority of cases being treated surgically. However in Western countries, a vast majority of the fistula cases are due to malignant genital tumors such as cervix cancer, with treatment consisting of both surgical and non-surgical means.

There is no data on the current situation of fistula in the female genital tract in Korea. The treatment records of Korean women with genital fistula were analyzed according to the cause, and location of the fistula, and the surgical outcome was also reviewed to provide valuable information for the selection of treatment modality in such patients.

### MATERIALS AND METHODS

From January 1992 to October of 2001, 117

Received September 3, 2001

Accepted February 22, 2002

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patients with female genital fistula who visited the departments of Obstetrics and Gynecology, Urology and General Surgery of Yonsei University Hospital in Seoul, Korea were enrolled in this study. Nine patients who had fistula of congenital cause and 48 patients who were treated conservatively were excluded from the study. Patient age, the location, size and nature of the fistula, the surgical routes of treatment, and the results of surgical correction were analyzed.

## RESULTS

### Age distribution and underlying cause

The mean age of patients was 48.6 years, and the age distribution by decades is listed in Table 1. The most common causes of fistula were congenital and accident in the patients under 20, obstetrical injuries in those 20 to 40, and malignant tumors and the resulting complications after treatment in those over 40 years old.

The underlying causes of fistula and the method chosen for correction are listed in Table 2. The number of fistula due to malignant tumors and resulting complications comprised 66 cases (56%); of which only 27 (41%) cases were treated by surgery and the remaining 39 cases were treated conservatively. All nine cases with congenital cause were corrected conservatively and these were excluded in this study. Causes of fistula other than malignancy or congenital mal-

formation numbered 42; of which 33 (79%) cases were treated by surgery.

Sixty patients were treated by surgery; of which 26 (43%) had vesicovaginal fistula, 21 (35%) rectovaginal fistula, 5 (8%) urethrovaginal fistula, 7 (12%) ureterovaginal fistula and 1 (2%) had perineovaginal fistula.

### Route of surgical repair and success rate

All cases of vesicovaginal fistula (26 cases) were treated by transabdominal or transvaginal fistulectomy or primary repair. In 3 (12%) of these cases, all of which had previously undergone surgery for cervical cancer or the definitive radiotherapy, the leaking recurred after surgery. Among the 18 patients with obstetrical or gynecological causes, one with a history of total abdominal hysterectomy also suffered leakage recurrence after repair (Table 3).

**Table 1.** Age Distribution of Female Fistula

Age	Patients
< 10	12
11-20	4
21-30	9
31-40	18
41-50	25
51-60	20
> 60	29
Mean ( $\pm$ SD)	48.6 ( $\pm$ 16.7)

**Table 2.** Causes of Female Fistula

Cause	No. of Patients	No. of Surgery
Cervix Ca (OP/OP+RT/RT/CCRT)	45 (6/14/13/12)	18 (4/8/4/2)
Rectal Ca (OP/OP+RT)	15 (10/5)	7 (5/2)
Endometrial Ca (OP+RT)	4	1
Bladder Ca (RT)	2	1
Total abdominal hysterectomy	13	12
SUI surgery	3	2
Vaginal delivery	10	8
Cesarean section	6	4
Trauma	9	7
Others	1	0
Congenital	9	9

OP, operation; RT, radiation therapy; CCRT, concurrent chemoradiotherapy; SUI, stress urinary incontinence.

**Table 3.** Relationship between Cause, Prognosis and Surgical Approach

Cause	Patients (Recurrence)	Surgical Approach
Vesico-Vaginal Fistula		
Cervix Ca > OP	2 (2)	TA (1)/TV (1)
Cervix Ca > OP+RT	5 (1)	TA (5)
Bladder Ca > RT	1 (0)	TA (1)
Total abdominal hysterectomy	9 (1)	TA (4)/TV (5)
SUI surgery	1 (0)	TA (1)
Vaginal delivery	3 (0)	TA (2)/TV (1)
Cesarean section	4 (0)	TA (4)
Trauma	1 (0)	TA (1)
Recto-Vaginal Fistula		
Rectal Ca > OP	5 (0)	TA (3)*/TV (2)
Rectal Ca > OP+RT	2 (0)	TA (2)
Cervix Ca > RT	6 (1)	TA (6)
Cervix Ca > OP+RT	1 (0)	TA (1)
Endometrial Ca > OP+RT	1 (0)	TA (1)
Total abdominal hysterectomy	1 (0)	TA (1)
SUI surgery	1 (0)	TR (1)
Vaginal delivery	3 (0)	TR (2)/TV (1)
Trauma	1 (0)	TV (1)
Urethro-Vaginal Fistula		
Vaginal delivery	1 (1)	TV (1)
Trauma	4 (0)	TA (3) <sup>†</sup> /TV (1) <sup>†</sup>
Uretero-Vaginal Fistula		
Cervix Ca > OP	2 (0)	TA (2) <sup>‡</sup>
Cervix Ca > OP+RT	2 (0)	TA (2) <sup>‡</sup>
Total abdominal hysterectomy	2 (0)	TA (2)
Trauma	1 (0)	TA (1)
Perineo-Vaginal Fistula		
Vaginal delivery	1 (0)	TA (1)

\*Miles' operation; <sup>†</sup>Urethroplasty; <sup>‡</sup>Ureteroneocystostomy.

TA, transabdominal; TV, transvaginal; TR, transrectal.

Three of the 21 patients with rectovaginal fistula were treated by Mile's operation, and another 5 were treated by transabdominal, transvaginal or transrectal fistulectomy, or primary repair. Among these, 1 patient recurred after transabdominal fistulectomy and the patient undergoing primary repair had a previous history of radiotherapy due to cancer of cervix. The 5 patients with urethrovaginal fistula were treated by fistulectomy, primary repair or urethroplasty. One patient's fistula developed after her vaginal delivery failed to resolve after transvaginal fistulectomy and primary repair.

The 7 patients with ureterovaginal fistula were all successfully treated by ureteroneocystostomy,

and the one patient with perineovaginal fistula was also successfully treated by transrectal fistulectomy and primary repair.

#### Location of fistula and success rate

Seven cases of vesicovaginal fistula were located at the bladder fundus, and another 4 at the bladder trigone. All 11 fistulas were repaired by the transabdominal route. Eight cases of fistula located at the bladder base and another 7 at the bladder neck were managed by the transabdominal and transvaginal approach. Two out of 7 fundal cases and 2 out of 12 basal fistulas recurred after the surgical correction (Table 4). Among the

**Table 4.** Relationship between Location, Surgical Approach and Prognosis

Location	Surgical Approach	Patients (Recurrence)
Vesico-Vaginal Fistula		
Bladder fundus	TA (7)	7 (2)
Bladder base	TV (7)/TA (1)	8 (1)
Bladder base (Trigone)	TA (4)	4 (1)
Bladder neck	TA (5)/TV (2)	7 (0)
Recto-Vaginal Fistula		
Anal verge (>5 cm)	TA (15)	15 (1)
Anal verge (<5 cm)	TR (3)/TV (3)	6 (0)
Urethro-Vaginal Fistula		
Urethral meatus	TA (3)	3 (0)
Urethra	TV (2)	2 (1)
Uretero-Vaginal Fistula		
Ureterovesical junction	TA (7)	7 (0)
Perineo-Vaginal Fistula		
Anal verge (<5 cm)	TR (1)	1 (0)

21 rectovaginal fistulas, the fifteen cases located over 5 cm from the anal verge were treated via the transabdominal route and one recurred. The remaining 6 cases of fistula within 5 cm from the anal verge were treated successfully via either the transvaginal or transrectal route. Among the 5 urethrovaginal fistulas, 3 were located in the urethral meatus and were successfully treated via the transabdominal route, and the remaining 2 cases located in the urethra were treated transvaginally, but one of these 2 cases was recurred. The 7 cases of ureterovaginal fistula were treated transabdominally and the one of perineovaginal fistula was treated through the rectum, all of which were successful.

## DISCUSSION

Since the incidence rate of female genital fistula is an important index of gynecological treatment,<sup>1</sup> it is very important to analyze the causes and results of the various treatment modalities in order to establish an optimal mode of treatment. Our series is the first review dealing with female genital fistula in Korea, and can therefore provide valuable information regarding treatment in the general Asian population. The major causes of female genital fistula in developing countries are mostly obstetrical,<sup>2,3</sup> but the etiology is quite dif-

ferent in Western countries where the main causes are malignant tumors and consequent complications following treatment.<sup>4,5</sup> In the latter case, although the majority of patients are treated conservatively some still require surgical treatment.

Among the 60 patients of this study who were treated surgically, a total of 6 cases recurred and most (4/6) of these involved the repair of the fistula after radical treatment for cervical cancer. Fortunately, all 6 recurred fistula were successfully cured after second surgery except for one in a patient with cervix cancer. The result suggests that gynecology oncologists and radiotherapists should bear in mind the ever-present risk of genital fistula in these patients.

The cause of ureterovaginal fistula due to cervical cancer surgery in our series were successfully treated by ureteroneocystostomy, thus not all fistula following the treatment of cervical cancer should be treated conservatively, even in cases of difficult fistula involving the ureter.<sup>6</sup> Vesicovaginal fistula is the most common female genital fistula, and the recurrence rate after surgical correction varied according to the location of the fistula.<sup>7,8</sup> In our series, fistulas located at the bladder fundus and base had a high recurrence rate. Meeks and associates reported that the vesicovaginal fistula followed by total abdominal hysterectomy recurred with even a single passage of the suture material into bladder wall,<sup>9</sup> in-

cluding that it is necessary for the surgeon to pay attention to reducing bladder fundal and basal trauma when total abdominal hysterectomy is performed. One case of rectovaginal fistula located over 5 cm from the anal verge and another of urethrovaginal fistula located in the urethra recurred. These poor outcomes were related to the size of the opening rather than the location of the fistula.

Similar to the other reported results, fistulas located in the lower vagina were generally corrected through the transvaginal or transrectal route. Other circumstances, such as fistulas in the upper vagina, those associated with severe adhesion that prevented operation with the transvaginal or transrectal approach, and those located in the functional areas of the lower urinary tract such as the bladder trigone, urethral meatus and ureterovesical junction, are best managed by transabdominal exposures.<sup>10</sup>

Even though Frommuller and Hofmockel reported a cure rate for vesicovaginal fistula followed by total abdominal hysterectomy that corrected through the transvaginal route that was as high as that for the transabdominal route, they did not analyze the surgical outcome according to the fistula location or the nature of the initial injury.<sup>11</sup> Our data suggested that the correct choice of surgical methods based on fistula location and cause is most the important element in achieving a high success rate.

Until now, only primitive investigations into female genital fistula in Korea have been conducted, but with the increase in the incidence of malignant female genital tumors, the number of female genital fistulas is increasing as a consequence of the increasing complications associated with gynecologic oncology therapy. Our study was performed to establish a standard surgical

treatment modality for Korean cases of female genital fistula and we believe that our results will contribute to enhancing the quality of surgical treatment provided for Korean patients with this condition.

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