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Practice Patterns Regarding Management of Rectovaginal Fistulae: A Multicenter Review From the Fellows' Pelvic Research Network

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Abstract

Objectives—Rectovaginal fistulae (RVFs) are often debilitating and there are no established treatment algorithms. We sought to describe current diagnosis and management strategies for RVFs across the United States.

Methods—This institutional review board–approved multicenter retrospective study included 12 sites. Cases were identified using *International Classification of Diseases, Ninth Revision* codes during a 5-year period. Demographics, management, and outcomes of RVF treatment were collected.

Results—Three hundred forty-two charts were identified; 176 (52%) met criteria for inclusion. The mean (SD) age was 45 (17) years. Medical history included hypertension (21%), cancer (17%), Crohn disease (11%), and diabetes (7%). Rectovaginal fistulae were often associated with obstetric trauma (42%), infection/inflammation (24%), and cancer (11%). Overall, most RVFs were primary (94%), small (0.5–1.5 cm; 49%), transsphincteric (31%), and diagnosed via vaginal and rectal (60%) examination. Eighteen percent (32/176) were initially managed conservatively for a median duration of 56 days (interquartile range, 29–168) and 66% (21/32) of these resolved. Almost half (45%) of RVFs treated expectantly were tiny (<0.5 cm). Eighty-two percent (144/176) of subjects were initially managed surgically and 81% (117/144) resolved. Procedures included simple fistulectomy with or without Martius graft (59%), transsphincteric repair (23%), transverse transperineal repair (10%), and open techniques (8%), and 87% of these procedures were performed by urogynecologists.

Conclusions—In this large retrospective review, most primary RVFs were treated surgically, with a success rate of more than 80%. Two thirds of RVFs managed conservatively resolved spontaneously, and most of these were tiny (<0.5 cm). These success rates can be used in counseling to help our patients make informed decisions about their treatment options.

Keywords

rectovaginal fistulae; fistulectomy; expectant management; surgical management

Rectovaginal fistulae (RVFs), epithelialized tracts connecting the rectum and vagina, develop after insult or ischemia to the involved tissues, and may follow injury from childbirth, inflammatory bowel disease, malignancy, pelvic surgery, or radiation.^{1–4} Depending on their size and exact location, RVFs may cause flatal or fecal incontinence, vaginal discharge, chronic pelvic pain, dyspareunia, and pelvic malodor, all of which can be physically and emotionally debilitating to affected women.^{5,6}

Rectovaginal fistulae may be managed expectantly or surgically. Expectant management includes optimization of stool consistency and avoidance of diarrhea.⁷ Surgical management may include correction via transvaginal, transanal, perineal, or abdominal approach, with or without concomitant tissue or muscle flaps, and with or without temporary stool diversion.² However, the timing of surgical repair is somewhat controversial. Although some surgeons advocate a 3- to 6-month period of conservative management before surgical repair to allow for reduction in tissue edema and inflammation,^{8–10} others suggest that the rate of successful closure of RVFs with expectant management is sufficiently low and patients should be

offered immediate surgical repair.^{11,12} Currently, many surgeons believe that early intervention for all types of fistulae is as effective as delayed or expectant management because it alleviates unnecessary patient discomfort and anxiety. Nevertheless, in the setting of acute infection or inflammation, surgical repair should be postponed until antibiotic or immunosuppressive therapy renders the surrounding tissues healthy, thus optimizing the chances for successful repair.⁷

Understanding the varied types of fistulae and the factors influencing their development enables surgeons to develop an individualized management plan appropriate for each patient.⁶ However, the decision to proceed with expectant versus surgical management remains controversial. Choice of therapy is based largely on expert opinion and surgeon experience as we lack a randomized controlled trial to support a standard protocol. The purpose of this multicenter retrospective case series was to outline current practice patterns of RVF management in the United States, specifically detailing the type, timing, frequency, and outcomes of applied treatments, to inform patient counseling and potentially development of a future treatment algorithm.

MATERIALS AND METHODS

This multicenter retrospective study through the Fellows' Pelvic Research Network included data from 12 academic sites affiliated with Female Pelvic Medicine and Reconstructive Surgery fellowship programs within the United States, all of which obtained institutional review board approval. Possible cases of RVFs were identified using *International Classification of Diseases, Ninth Revision (ICD-9)* codes of female genital digestive tract fistulae during July 2006 through June 2011.¹³ An outpatient query at each site for the following *ICD-9* codes was performed: 565.1 (fistula, anal), 596.1 (intestine-vesical fistula), 596.2 (vesical fistula, not elsewhere classified), 619.0 (urinary-genital tract fistula, female), 619.1 (digestive-genital tract fistula, female), 619.2 (genital tract-skin fistula, female), 619.8 (other specified fistulae involving female genital tract), and 619.9 (unspecified fistula involving female genital tract).¹³ This inclusive method permitted charts that would otherwise be excluded due to restricted use of more specific *ICD-9* codes. As this was a descriptive study, an a priori query of *ICD-9* codes pertaining to RVFs at the primary site was performed. This search yielded 26 cases during 5 years. A conservative estimate of the availability of 25 cases during 5 years at 8 to 10 other institutions was made. Thus, a minimum of 10 sites contributing 10 cases each was deemed adequate for analysis and our target sample size was 100 cases.

All charts identified through *ICD-9* code searching were screened for accuracy of coding by the urogynecologist who was the primary investigator at each site, and when true cases of RVFs were identified, data were extracted by the same person. Those charts with missing data for diagnosis or management were excluded. Information extracted from the medical record included the patient's age; body mass index; demographics; and medical, surgical and obstetrical history. We also extracted information about possible risk factors for fistula formation (eg, inflammatory bowel disease, radiation exposure, and perineal trauma), presenting complaints, method of diagnosis, and the suspected etiology of the RVFs. Detailed information about fistula characteristics (size, location, complexity) as well as

timing, characteristics, and outcomes of management were collected. De-identified data were provided to the principal investigator, who reviewed all cases to confirm their suitability for inclusion.

The size of the fistula was characterized as tiny (pinpoint, <0.5 cm), small (0.5–1.5 cm), medium (1.6–3.0 cm), and large (>3.0 cm).^{5,6} Fistulae that were within the first 3 cm from the anal orifice and the dentate line were anovaginal, and those cephalad to the dentate line were rectovaginal. The fistulae were also categorized into types as follows: (1) superficial—tracts distal to the internal and external anal sphincter (EAS) complexes; (2) intersphincteric—tracts between the internal anal sphincter and EAS; (3) transsphincteric—tracts from the intersphincteric space through the EAS; (4) suprasphincteric—tracts which left the intersphincteric space over the top of the puborectalis and penetrated the levator muscle before communicating with the skin; and (5) extrasphincteric—tracts outside the internal and EAS, which penetrated the levator muscle and emptied into the rectum.¹⁴

Primary management of the RVFs was divided into expectant and surgical categories. Local wound debridement, low residue diet, sitz baths, and antibiotic or immunosuppressive therapy were categorized as expectant management. Details about surgical management included route of approach (abdominal, vaginal, rectal, or perineal), use of tissue flap(s), and use of concomitant diverting colostomy, along with success rates, reoperation rates, length of hospital stay, and incidence of postoperative sequelae. We also collected information about surgeon subspecialty (urogynecologist, gynecologic oncologist, colorectal surgeon, or obstetrician-gynecologist), use and type of preoperative bowel preparation and antibiotics, and use of postoperative antibiotics, stool softeners, and dietary modification recommendations. Patients who initially used conservative treatment followed by surgical treatment had data from both types of treatment recorded.

Initial surgical treatment was compared to conservative treatment using Student *t* tests for continuous variables and χ^2 or Fisher exact tests for categorical variables. Similar analyses were performed to compare success rates for initial surgical management versus surgical management after failed conservative management. Lastly, logistic regression was performed to identify factors associated with resolution of fistula after surgical management. Statistical analyses were performed using SPSS Version 19 (IBM Company, Chicago, Ill) and *P* value less than 0.05 was considered significant.

RESULTS

A total of 342 charts were reviewed, of which 176 (52%) subjects met inclusion criteria (Fig. 1). One hundred sixty-six (49%) were excluded due to the following: wrong diagnosis (141), loss to follow-up (17), or missing data (8). The mean (SD) age of included cases was 45 (17) years and mean (SD) body mass index was 29 (11) kg/m². Most were white (63%), non-smokers (64%), premenopausal (58%), and married (62%) (Table 1). Included subjects (*n* = 176) were divided into 4 main geographic regions as follows: Northeast, Southeast, Midwest, and West. Further analysis of these subgroups for all variables revealed no significant differences among regions (data not shown). Nonsurgical etiologies for the development of RVFs were obstetric trauma (42%), infection/inflammation (24%),

unspecified (20%), and cancer (11%). Surgical etiologies of the RVFs included hysterectomy (19%), bowel resection (15%), and hemorrhoidectomy (4%) (Table 1). Urogynecologists initially managed 87% (153/176) of the RVFs. Further analysis of the demographics revealed some significant differences were among RVFs initially managed expectantly versus surgically. Asian women ($P=0.04$), and those with prior sphincteroplasty ($P=0.02$), were significantly more likely to have expectant management initially (Table 1). No significant differences were noted in presenting complaints, causes, diagnostic methods, or fistula characteristics.

The fistulae in this series were predominantly less than 1.5 cm (83%), rectovaginal (68%), transsphincteric (31%), and diagnosed by physical examination [vaginal (71%) and/or rectal (60%)]. Most RVFs were primary fistulae (94%). Table 2 outlines details of RVF characteristics by initial management type. Overall, 82% (146/176) of the RVFs were managed surgically. Some differences between RVFs managed surgically and those managed expectantly are highlighted in Table 3. Additionally, preoperative management in these surgical cases entailed liquid diet (44%), Fleets enema (36%), magnesium citrate (28%), GoLytely (21%), and soap suds enema (1%) (data not shown). At the time of surgery, the most common antibiotic administered was intravenous cefazolin (52%) either alone or in combination with other intravenous antibiotics. Surgical procedures performed included simple fistulectomy with or without Martius graft (59%), transsphincteric repair (23%), transverse transperineal repair (10%), and open techniques that included the addition of omental or rectus abdominus interposition (8%). Postoperative management varied, but commonly included stool softeners (58%), antibiotics (50%), liquid diet (24%), or low residue diet (17%). Surgical patients had first postoperative follow-up at a median of 14 days with 6.3% of patient requiring a transurethral catheter postoperatively. Surgical treatments seemed to be tailored to the location and size of the fistula in many cases, with most small or tiny RVFs being managed by simple fistulectomy ($P<0.05$), whereas medium RVFs were treated with open techniques ($P<0.05$) (Tables 4–6). Initial surgery was successful in 81.4% of the cases with a median follow-up of 75 days (interquartile range, 43–188) (Fig. 2; Table 3).

A minority of RVFs (32/176, 18%) were initially managed conservatively. Of these, almost half (45%) were tiny (<0.5 cm) (Table 2). The median duration of expectant management was 56 days (interquartile range, 29–168) (Table 3). Conservative treatment modalities were variable but included daily sitz baths (9%), a variety of oral antibiotics (9%), wound debridement (3%), and low-residue diet (3%) (data not shown). Most of these conservatively managed cases also received adjunct therapies including topical estrogen, fiber supplementation, or physical therapy. Conservative management was successful in 65.6% (21/32) of cases (Table 3). Of those who failed conservative treatments, 25% (8/32) proceeded with surgery. There were no differences in these groups in regard to demographics, fistula characteristics, or type of surgery (data not shown). Furthermore, likelihood of RVF resolution with initial management strategy did not differ significantly between management strategies ($P>0.05$). Overall, 91.4% (139/152) of RVFs undergoing any surgical management resolved (Fig. 2).

DISCUSSION

This study illustrates that primary RVFs can be successfully managed promptly with either expectant or surgical management. Although the median follow-up for those managed expectantly was merely 8 weeks and most were tiny in size, most resolved. Concomitantly, nearly all RVFs eventually receiving surgical management were successfully treated, mostly with simple fistulectomy. This information contributes to the development of useful treatment guidelines for providers regarding the management of RVFs.

Rectovaginal fistulae occur in less than 1% of all vaginal deliveries. Most of these births are complicated by infected episiotomies, poor surgical technique, and wound breakdown.⁵ However, the development of fistulae may also be related to gynecologic surgery, such as hysterectomy.^{5,10} Complications such as intraoperative injury,⁵ pelvic inflammatory disease, endometriosis, and medical comorbidities such as diabetes, chronic fecal impaction, and history of pelvic irradiation may all increase formation of a fistula.^{5,6,15} Our study's data were consistent with the known etiologies and risk factors of these other reports.

A controversial point among fistula literature is the timing of the repair. A small number of RVFs will close spontaneously⁷ and noninvasive therapies in these cases include initial local wound care, drainage of abscesses, a 1- to 2-week course of broad spectrum oral antibiotics, and a low-residue diet to decrease the seeding of the wound by liquid stool. Fibrin glue has been used in the treatment of small simple fistulae, showing good short-term outcomes but poor long-term response¹⁶; however, cases from our study did not use this therapy. Although our data included small simple RVFs, the subjects were managed by urogynecologists and fibrin glue is a modality traditionally used by colorectal surgeons. Furthermore, data support the surgical repair be performed after 3 months to reduce local tissue inflammation.² Our study reports a median resolution time less than 3 months for those RVFs managed surgically, suggesting that prompt intervention may bear the advantage of minimizing unnecessary suffering. However, median resolution of RVFs after surgical intervention is different than time to surgical intervention preoperatively and this chart review could not accurately determine the specific date of the inciting event. Nonetheless, in contrast, the median duration of conservative treatment for RVFs in this study was only 56 days, after which, a large number went on to surgery; therefore, the success of expectant management may have been underestimated in this study. Still, the success of expectant management with merely 8 weeks of follow-up was high, implying that with an additional 4 to 6 weeks of conservative treatment, more RVFs may resolve without subsequent surgery. The success of expectant management in our study population may be due to the tiny size of RVFs in this initial treatment group or to the lack of cases considered to be more complicated (ie, affected by Crohn disease). Regarding surgical management, various techniques were used, ranging from simple fistulectomy and layered repair, for most small fistulae located in the distal transsphincteric region, to abdominal approaches with omental flaps or biologic grafts for larger RVFs in other locations throughout the rectovaginal space.^{2,7,12,16} This information provides useful clinical data to help guide surgeons in appropriate surgical planning and techniques. Although we reported use of a colostomy in a smaller number of our cohort, it is possible that this was related to the fact that more of our RVFs were treated by urogynecologists rather than a colorectal surgeon. This was additionally confirmed by the

fewer numbers of cases with cancer or preexisting bowel disorders such as Crohn, which is a potential limitation of this study.

This study was also limited by constraints regarding classification. Fistulae can be categorized as small or large, low or high, and single or multiple.^{5,6} In general, most RVFs are 3 cm above the anal verge, whereas those located near the EAS are termed anovaginal fistulae. Rosenshein and colleagues¹⁴ divided rectovaginal defects into 5 distinct types as an alternate method of anatomical classification. To maintain standardization, our data collection forms followed the classification system of Rosenshein and added an area for detailing the size and location of the RVFs. The diagnosis of fistulae can be as varied as the factors influencing their development and several approaches were used including rectal examination with dye, endoanal sonography, proctoscopy, vaginography, barium enema, magnetic resonance imaging, or a pelvic computed tomography with contrast. Although widely ranging, this variability is consistent with the literature.^{5,6} We were further limited by the retrospective nature of the study, which could lead to missing data that prevented analysis of all variables of interest. For transparency with data reporting, the number of cases collected for each variable is detailed in our tables. Nevertheless, our strengths include a multicenter design within the United States, incorporating data from 12 academic centers with diverse geographic representation, as well as, the large number of cases in the series. This adds to the generalizability of the results and the clinical utility of this information.

In conclusion, RVFs are an uncommon but devastating problem that may be challenging to treat. Multicenter descriptions of practice patterns and outcomes are essential to developing useful treatment guidelines. We illustrate that primary fistulae less than 0.5 cm were successfully managed promptly with conservative measures. We were also reassured that when surgical intervention was deemed appropriate, most resolved. This information is vital to guide treatment plans for physicians and their patients experiencing RVFs.

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Biography

CDR Joy A. Greer is a military service member. This work was prepared as part of her official duties. Title 17, USC, §105 provides that “Copyright protection under this title is not available for any work of the United States Government.” Title 17, USC, §101 defines a US Government work as a work prepared by a military service member or employee of the US Government as part of that person’s official duties. The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, nor the US Government.

FIGURE 1.
Flow chart of included cases.

FIGURE 2.
Surgical management success rate.

TABLE 1

Sample Characteristics Stratified by Initial Management Strategy

	Total Sample, n (%)	Initial Expectant, n (%)	Initial Surgery, n (%)	P*
Age, mean (SD), y	n = 175 44.89 (16.6)	n = 32 40.88 (17.9)	n = 143 45.79 (16.2)	0.08
BMI, mean (SD), kg/m ²	n = 168 28.56 (10.0)	n = 31 28.91 (7.0)	n = 137 28.48 (11.8)	0.68
Ethnicity [†]	n = 168	n = 30	n = 138	0.04
White	105 (62.5)	16 (53.3)	89 (64.5)	
Black or African American	24 (14.3)	4 (4.3)	20 (14.5)	
Hispanic	21 (12.5)	2 (6.7)	19 (13.8)	
Asian	14 (8.3)	6 (20.0)	8 (5.8)	
Relationship status	n = 166	n = 31	n = 135	
Married	103 (62.0)	18 (58.1)	85 (63.0)	0.42
Single	37 (22.3)	10 (32.3)	27 (20.0)	
Vaginal delivery	n = 171	n = 32	n = 139	0.91
0	37 (21.6)	7 (21.9)	30 (21.6)	
1–3	121 (70.8)	22 (68.8)	121 (70.8)	
4–6	13 (7.6)	3 (9.4)	10 (7.2)	
Weight status [†]	n = 168	n = 31	n = 137	0.10
BMI < 30 kg/m ²	109 (64.9)	16 (51.6)	93 (67.9)	
BMI ≥ 30 kg/m ²	59 (35.1)	15 (48.4)	44 (32.1)	
Tobacco use	n = 168	n = 30	n = 138	0.856
Current	34 (20.2)	7 (23.3)	27 (19.7)	
Past	26 (15.5)	5 (16.7)	21 (15.2)	
Never	108 (64.3)	18 (60.0)	90 (65.2)	
Hormone status	n = 154	n = 29	n = 135	0.67
Premenopausal	95 (57.9)	19 (65.5)	76 (56.3)	
Postmenopausal (no hormone therapy)	52 (31.7)	7 (24.1)	45 (33.2)	
Medical comorbidities [†]				
Crohn	20 (11.4)	4 (12.5)	16 (11.1)	0.76
Diverticulitis	8 (4.5)	1 (3.1)	7 (4.9)	1.00
Ulcerative colitis	6 (3.4)	1 (3.1)	5 (3.5)	1.00
Endometriosis	2 (1.1)	0 (0)	2 (1.4)	1.00
Pelvic irradiation	5 (2.9)	0 (0)	5 (3.5)	1.00
Cancer	30 (17.1)	3 (9.4)	27 (18.9)	0.30
Prior hysterectomy	N = 42	N = 8	N = 34	0.24
Abdominal	28 (66.7)	4 (50.0)	24 (70.6)	
Vaginal	9 (21.4)	3 (37.5)	6 (17.6)	
Prior surgery [†]				
Diverticulectomy	3 (1.7)	1 (3.1)	2 (1.4)	0.45

	Total Sample, n (%)	Initial Expectant, n (%)	Initial Surgery, n (%)	P*
Bowel resection	26 (14.8)	3 (9.4)	23 (16.0)	0.42
Hemorrhoidectomy	7 (4.0)	1 (3.1)	6 (4.2)	1.00
Sphincteroplasty	4 (2.3)	3 (9.4)	1(0.7)	0.02
Nonsurgical etiologies				
Obstetric trauma	74 (42.3)	15 (20.3)	(79.7)	0.54
Infection	16 (9.1)	1 (6.2)	15 (93.8)	0.17
Inflammation	26 (14.8)	3 (11.5)	23 (88.5)	0.26
Unspecified	35 (20.0)	6 (17.1)	29 (82.9)	0.86
Cancer	30 (17.1)	3 (10.0)	27 (90)	0.20

Please note that these statistical comparisons were conducted independently, and therefore may not add up to 100%.

* χ^2 test unless otherwise noted.

[†] Fisher exact test.

BMI indicates body mass index.

TABLE 2

RVF Characteristics

	Total Sample, n (%)	Initial Expectant, n (%)	Initial Surgery, n (%)	P
RVF type *	n = 98	n = 17	n = 81	0.19
Superficial	12 (12.2)	5 (29.4)	7 (8.6)	
Intersphincteric	12 (12.2)	1 (5.9)	11 (13.6)	
Transsphincteric	30 (30.6)	5 (29.4)	25 (30.9)	
Suprasphincteric	19 (19.4)	3 (17.6)	16 (19.8)	
Extrasphincteric	25 (25.5)	3 (17.6)	22 (22.4)	
RVF location *	n = 157	n = 27	n = 130	0.13
Anovaginal	50 (31.8)	13 (48.1)	37 (28.5)	
Rectovaginal	106 (67.5)	14 (51.9)	92 (70.8)	
RVF size *	n = 151	n = 29	n = 122	0.22
Tiny (<0.5 cm)	52 (34.4)	13 (44.8)	39 (32.0)	
Small (0.5–1.5 cm)	74 (49.0)	12 (41.4)	62 (50.8)	
Medium (>1.5–3 cm)	16 (10.6)	1 (3.4)	15 (12.3)	
Large (>3 cm)	9 (6.0)	3 (10.3)	6 (4.9)	

* Missing data: Of the 144 patients undergoing initial surgical management, missing data were as follows: 22, size; 15, location; and 63, type. Of the 32 patients undergoing initial expectant management, missing data were as follows: 3, size; 5, location; and 15, type.

TABLE 3

RVF Characteristics by Management Type

Characteristic	Surgical Management, n = 144	Expectant Management, n = 32	P*
Size (small), n (%)	101 (70.2)	25 (86.2)	0.28
Rectovaginal location (anovaginal), n (%)	92 (63.9)	14 (43.8)	0.12
Type, n (%)			
Superficial	7 (4.9)	5 (15.6)	0.18
Transsphincteric	25 (17.4)	5 (15.6)	
Extrasphincteric	22 (15.3)	3 (9.4)	
% Success with initial management	81%	66 %	n/a
Days to resolution, median (IQR)	75 (43–188)	56 (29–168)	n/a

* χ^2 test

IQR indicates interquartile range.

TABLE 4

Operative Technique by RVF Type

Operative Technique	Superficial, n = 8	Intersphincteric, n = 11	Transsphincteric, n = 25	Suprasphincteric, n = 16	Extrasphincteric, n = 17
Simple fistulectomy, n = 34 (%)	4 (11.8)	5 (14.7)	9 (26.5)	9 (26.5)	7 (20.6)
Martius graft, n = 8 (%)	1 (12.5)	3 (37.5)	1 (12.5)	1 (12.5)	2 (25.0)
Transsphincteric repair, n = 20 (%)	2 (10.0)	3 (15.0)	13 (65.0)	2 (10.0)	0 (0.0)
Transvaginal-transsphincteric repair, n = 10 (%)	1 (10.0)	0 (0.0)	1 (10.0)	4 (40.0)	4 (40.0)
Open repair, n = 3 (%)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (100.0)
Open repair with rectus abdominis, n = 2 (%)	0 (0.0)	0 (0.0)	1 (50.0)	0 (0.0)	1 (50.0)

TABLE 5

Operative Technique by RVF Location

Operative Technique	Anovaginal, n = 42	Rectovaginal, n = 79
Simple fistulectomy, n = 64 (%)	24 (37.5)	40 (62.5)
Martius graft, n = 9 (%)	2 (22.2)	7 (77.8)
Transsphincteric repair, n = 29 (%)	14 (48.3)	15 (51.7)
Transvaginal-transsphincteric repair, n = 12 (%)	1 (8.3)	11 (91.7)
Open repair, n = 5 (%)	1 (20.0)	4 (80.0)
Open repair with rectus abdominis, n = 2 (%)	0 (0.0)	2 (100.0)

TABLE 6

Operative Technique by RVF Size

Operative Technique	Tiny, n = 40	Small, n = 62	Medium, n = 10	Large, n = 5
Simple fistulectomy, n = 66 (%)	24 (36.4)	39 (59.1)	1 (1.5)	2 (3.0)
Martius graft, n = 8 (%)	4 (50.0)	2 (25.0)	1 (12.5)	1 (12.5)
Transsphincteric repair, n = 24 (%)	6 (25.0)	13 (54.2)	3 (12.5)	2 (8.3)
Transvaginal-transsphincteric repair, n = 12 (%)	5 (41.7)	5 (41.7)	2 (16.7)	0 (0.0)
Open repair, n = 5 (%)	1 (20.0)	3 (60.0)	1 (60.0)	0 (0.0)
Open repair with rectus abdominis, n = 2 (%)	0 (0.0)	0 (0.0)	2 (100.0)	0 (0.0)