A 20-year Experience of Rectovaginal Fistula Management in a Tertiary University Hospital in Thailand

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Objective: *The purpose of this study was to determine etiology, treatment and outcome of patients with rectovaginal fistula (RVF) who were treated in a tertiary university hospital in Thailand.*
Material and Method: *The authors retrospectively reviewed the medical records of patients with RVF treating from 1994 to 2013 at the Faculty of Medicine Siriraj Hospital. Data were recorded including patient's demographics, etiology, treatment and outcome.*
Results: *This study included 108 patients with median age of 55 years (range 24 to 81). Radiation injury was the most common cause of RVF (44%) followed by direct invasion of rectal or gynecologic malignancies (20%), postoperative complication (16%) (notably from 10 low anterior resections, 5 transabdominal hysterectomies, 1 stapled hemorrhoidopexy and 1 injection sclerotherapy for hemorrhoid) and obstetric injury (11%). Diverting colostomy was the most frequent operation performed for both radiation-related RVF and malignancy-related RVF. Most operation-related RVF were healed after fecal diversion with or without either local repair or major resection. All obstetric-related RVFs were successfully treated by local tissue repair with or without anal sphincteroplasty.*
Conclusion: *Radiation injury and advanced pelvic malignancies were two most common causes of RVF in this study. Fecal diversion can be either initial operation or definite treatment in most patients with RVF. Surgical correction resulted in good outcomes for postoperative RVF and obstetric-related RVF.*

Keywords: *Rectovaginal fistula, Rectum, Vagina, Fistula, Surgery, Complication, Radiation, Obstetric, Management, Outcome*

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Rectovaginal fistula (RVF) represents a distressing condition for patients and a challenging situation for surgeons. The choices and success rate of RVF treatment depends on etiology, size and location of the fistula as well as the condition of involved tissues and underlying disease of the patient. The etiologies of RVF include obstetric injury, inflammatory bowel disease, advanced malignancies of pelvic organs, pelvic irradiation and a sequela of pelvic or rectal surgery[1-5]. Accordingly, therapeutic options vary from conservative management, fecal diversion, local tissue repair (with or without flap reconstruction) to transabdominal operation[6-8] with an ultimate goal to closure the fistula and improve patient's quality of life.

The objectives of this study were to report the experience with RVF management from the largest university hospital in Thailand and to determine outcomes of various alternatives of management.

Material and Method

After obtaining an approval from the Siriraj Institutional Review Board (SIRB 525/2012), the authors retrospectively reviewed the medical records of patients with RVF treated from 1994 to 2013 in the Department of Surgery, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand. Data were recorded including patient's demographics, size and location of RVF, etiologies of fistula, associated fistula, anal continence, therapeutic options and their outcomes. Low RVF is defines as the fistula lining

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closed to the dentate line or the posterior fourchette of vagina. High RVF is defined as the fistula with vaginal opening at the level of the cervix. Middle RVF is located between the two[9]. Outcomes of treatment were defined as: heal (complete healing of RVF), improve (presence of RVF but patient had no or minimal symptom) and not improve (presence of RVF and patient had distressing symptom).

Results

This study included 108 patients with median age of 55 years (range 24 to 81). All patients clinically presented with passage of air or stool through the vagina. The median size of RVF was 1 cm (range 0.2 to 2). The location of RVF was classified as low in 45 patients (42%), middle in 41 patients (38%) and high in 22 patients (20%). Radiation injury was the most common cause of RVF (n = 47, 44%) followed by direct invasion of rectal or gynecologic malignancies (n = 22, 20%), postoperative complication (n = 17, 16%) and obstetric injury (n = 12, 11%) (Table 1).

There were 4 associated vesicovaginal fistulae and 3 enterovaginal fistulae in those with radiation-induced RVF. Regarding 17 operation-related RVF, they were associated with 10 low anterior resections for rectal cancer, 5 transabdominal hysterectomies, one stapled hemorrhoidopexy and one injection sclerotherapy for hemorrhoids.

Table 1. Etiologies of rectovaginal fistula

Etiologies	Rectovaginal fistula (n = 108)
Radiation injury, n (%)	47 (44)
Direct tumor invasion, n (%)	22 (20)
CA cervix	16
CA rectum	5
CA anal canal	1
Postoperative complication, n (%)	17 (16)
Low anterior resection	10
TAH BSO	5
Stapled hemorrhoidopexy	1
Sclerotherapy for hemorrhoid	1
Obstetric injury, n (%)	12 (11)
Infection, n (%)	9 (8)
Colorectal diverticulitis	6
Infected vaginal wall	3
Systemic lupus erythematosus, n (%)	1 (1)

CA = cancer; TAH BSO = total abdominal hysterectomy and bilateral salphingo-oophorectomy

Diverting colostomy was the most frequent operation performed for radiation-related RVF (39 out of 47 cases; 83%) (Table 2) and for malignancy-related RVF (20 out of 22 cases; 91%) (Table 3). Treatments for operation-related RVF are shown in Table 4. Generally, the fistulae were completely healed after fecal diversion with or without local repair or major resection except sclerotherapy-induced RVF was spontaneously healed after 3 months of conservative treatment. All obstetric-related RVFs were successfully treated by local tissue repair with or without anal sphincteroplasty (Table 5). Three patients out of 12 patients with obstetric-related RVF (25%) still experience some degree of anal incontinence after surgical correction. Transabdominal approach was commonly used for complicated diverticulitis with RVF. Meanwhile, transperineal approach was used for infected vaginal wall with RVF (Table 6).

Discussion

The etiologies of RVF could differ from countries to countries or from time to time (Table 7). In western countries, it has been reported that obstetric injury and Crohn's disease are the most common causes of RVF[7,8]. In contrast, the present study shows that pelvic irradiation and advanced pelvic malignancy are the leading etiologies of RVF in Thailand. Pelvic malignancies e.g. rectal, uterine, cervical or vaginal carcinoma may cause rectovaginal fistula by either direct tumor invasion or as a sequel of radiation therapy.

Since pelvic irradiation results in a various degree of proctitis, some patients may develop radiation-induced deep ischemic rectal ulcer which subsequently progresses to RVF formation. Radiation-induced RVF usually presents around 6 months to 2 years after pelvic radiotherapy[9], but a delayed presentation of RVF more than 10 years after pelvic irradiation was reported[10]. Risk factors for developing radiation-induced RVF include high total doses of radiation and a history of hysterectomy[11]. Concomitant genital fistula such as vesicovaginal fistula and enterovaginal fistula may be found in patients with RVF. Therefore, a careful history taking and physical examination-with some additional diagnostic imaging such as small bowel contrast study-are required for accurate diagnosis and treatment planning.

Diverting colostomy was the most frequent operation performed for radiation-related RVF and malignancy-related RVF due to their nature of advanced

Table 2. Management of 47 radiation-induced rectovaginal fistula and outcomes

Management	Number (%)	Outcome
Loop transverse colostomy	39 (83)	Improve
Low anterior resection with vaginal wall repair	3 (6)	Heal
End sigmoid colostomy	2 (4)	Improve
End transverse colostomy	1 (2)	Improve
Refuse to surgery	2 (4)	Not improve

Table 3. Management of 22 malignancy-related rectovaginal fistula and outcomes

Primary cancer	Management	Number	Outcome
CA cervix (n = 15)	Loop transverse colostomy	13	Improve
	Loop sigmoid colostomy	2	Improve
CA rectum (n = 6)	Loop transverse colostomy	4	Improve
	LAR with TAH BSO	1	Heal
	APR with posterior vaginalectomy	1	Heal
CA anal canal (n = 1)	Loop sigmoid colostomy	1	Improve

APR = abdominoperineal resection; CA = cancer; LAR = low anterior resection; TAH BSO = total abdominal hysterectomy and bilateral salphingo-oophorectomy

Table 4. Management of 17 operation-related rectovaginal fistula and outcomes

Index operation	Management	Number	Outcome
LAR (n = 8)	Loop transverse colostomy with/without local tissue repair	4	Heal
	Loop ileostomy with/without local tissue repair	2	Heal
	Redo LAR with coloanal anastomosis	2	Heal
LAR with diverting loop transverse colostomy (n = 1)	Spontaneous healing after 6 months	1	Heal
LAR with diverting loop ileostomy (n = 1)	Transanal repair	1	Heal
TAH BSO (n = 5)	Transanal repair	2	Heal
	Transanal repair with loop sigmoid colostomy	1	Heal
	Transvaginal repair with loop colostomy	1	Heal
	Hartmann's operation	1	Heal
Stapled hemorrhoidopexy (n = 1)	Transanal repair with loop sigmoid colostomy	1	Heal
Sclerotherapy for hemorrhoid (n = 1)	Spontaneous healing after 3 months	1	Heal

LAR = low anterior resection; TAH BSO = total abdominal hysterectomy and bilateral salphingo-oophorectomy

or recurrent disease. Some highly selected patients with radiation-related RVF or malignancy-related RVF, i.e. fit for major operation and resectable locally advanced cancer, are candidates for en bloc resection of the disease bowel or tumor harboring the RVF. The radical surgery would be an only way to remove the fistula in this situation. Despite appropriate treatment, radiation-related RVF and malignancy-related RVF in patients with cervical cancer had poor prognosis[12].

Regarding operation-related RVF, sphincter-

Table 5. Management of 12 obstetric-related rectovaginal fistula and outcomes

Management	Number (%)	Outcome
Transanal repair with overlapping anal sphincteroplasty	6 (50)	Heal
Endorectal advancement flap	4 (33)	Heal
Transvaginal repair	2 (17)	Heal

Table 6. Management of 10 infection or inflammation-related rectovaginal fistula and outcomes

Underlying disease	Management	Number	Outcome
Colorectal diverticulitis (n = 6)	AR or LAR with fistula repair with or without omental interposition	5	Heal
	Hartmann's operation	1	Heal
Infected vaginal wall (n = 3)	Transvaginal repair	2	Heal
	Transanal repair	1	Heal
Systemic lupus erythematosus (n = 1)	Loop sigmoid colostomy with medical control of underlying disease	1	Heal

AR = anterior resection; LAR = low anterior resection

Table 7. Etiologies of rectovaginal fistula in a published series of >80 cases, presented by reverse chronological order

Author, Country (year)	Case No.	Etiology						
		XRT	Cancer	Operation	Obstetric	Infection	IBD	Other
Lohsiriwat, Thailand (present)	108	44%	20%	16%	11%	8%	-	1%
Hotouras, multi-nations (2015)[1]	106	-	7%	35%	9%	-	35%	15%
Pinto, USA (2010)[2]	125	-	4%	16%	24%	5%	46%	6%
Mazier, USA (1995)[3]	95	-	-	-	81%	16%	-	3%
Lowry, USA (1988)[4]	81	-	-	7%	74%	10%	-	8%
Bandy, USA (1983)[5]	138	38%	-	6%	20%	6%	11%	19%

IBD = inflammatory bowel disease; XRT = pelvic radiation therapy

preserving operation was the most common cause of such a fistula in this study, followed by hysterectomy. RVF following stapled colorectal anastomosis may occur when the vaginal wall was incorporated into the staple line or when colorectal anastomotic leakage drains into the vagina. Restorative proctectomy with staple device and concomitant vaginal resection would increase risk for RVF[13]. On the other hand, RVF following hysterectomy is caused by inadvertent trauma to the rectal wall during pelvic dissection or during closure the vaginal stump. Laparoscopic and total abdominal hysterectomy, elderly, smoking, diverticulitis and pelvic adhesion were reported to be risk factor for RVF following hysterectomy[14]. Therefore, surgeons and gynecologist must ensure that there is no such thing happen during the surgery-by means of meticulous pelvic dissection and the careful formation of anastomosis or closure the vaginal stump. The vagina and the rectum should be meticulously dissected away from each other. Vaginal examination before firing a staple is mandatory for colorectal anastomosis. Rectal examination with or without endoscopy should be performed if intraoperative rectal injury is suspected. Due to fibrotic tissue from previous surgery and narrowing operative filed within the pelvic cavity, several or repeated transabdominal and transperineal operations may require for treatingoperation-related RVF. The corrective surgery

is usually a combination of resective procedure, repair and reinforcement or interposition with tissue (e.g. omentum and muscle flap) or mesh-with or without diverting stoma[15].

In a rare circumstance, procedure for prolapse and hemorrhoids (PPH), stapled hemorrhoidopexy and stapled transanal rectal resection for obstructed defecation (STARR) may result in low RVF because of inadvertent resection and stapled anastomosis of full-thickness rectal wall and parts of vaginal wall[16,17]. This type of RVF may be treated by transanal approach with or without interposition of local viable tissue.

For obstetric-related RVF, local tissue repair with or without anal sphincteroplasty was the common approach in our institute which yielded good surgical outcomes. Although a corrective surgery can restore anatomical defect, one-fourth of these patients still experienced some degree of anal incontinence. Unless there is a remaining anal sphincter defect, repeat or re-do anal sphincteroplasty would have no role in this situation. Instead, several methods such as biofeedback and sacral nerve stimulation have been used in this circumstance.

Many uncommon RVF can be treated on an individual basis e.g. anterior resection for complicated sigmoid diverticulitis with RVF or transvaginal repair for infected RVF. Other rare causes of RVF reported in the literature included severe perineal infection, Bechet's disease[18] and sexual intercourse[19]. The strength of the current study includes a large number of cases with various types and etiologies of RVF which were managed by experienced surgeons in a university hospital during the last twenty years. But the main limitation of this study is inherited to a retrospective nature in which some detailed information, such as the reason for performing a diverting stoma rather than doing a radical surgery, is not well noted. Another limitation is that only patients with RVF treated at the Department of Surgery were reviewed. It is also possible that some patients with RVF may have been seen and managed by gynecologists.

Conclusion

Pelvic irradiation and advanced pelvic malignancy were common causes of RVF in this study. Some patients with RVF may have concurrent vesicovaginal fistula and enterovaginal fistula. Fecal diversion can be either initial operation or definite treatment in most patients with RVF. Surgical correction resulted in good outcomes especially for postoperative RVF and obstetric-related RVF.

What is already known on this topic?

Rectovaginal fistula (RVF) is a suffering condition for patient and a challenging situation for clinicians. Etiologies of RVF are various and may be different among population and geographic region. Decision in the management of RVF depends on cause, location and size of the fistula as well as patient's underlying disease and surgeon's experience. The ultimate goals of RVF management are to make an anatomical correction of the fistula (if possible), to minimize patient symptom and to improve patient's quality of life.

What this study adds?

Pelvic irradiation and advanced pelvic malignancy are common causes of RVF-which may be different from western countries where inflammatory bowel disease, operation and trauma are more prevalent. Fecal diversion can be either initial operation or definite treatment in most patients with RVF. Surgical correction resulted in good outcomes especially for postoperative RVF and obstetric-related RVF.

Potential conflicts of interest

None.

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ประสบการณ์ 20 ปีในการรักษาภาวะรอยเชื่อมต่อระหว่างไส้ตรงกับช่องคลอดในโรงพยาบาลศิริราช

วรุตม์ โล่ห์ศิริวัฒน์, ดนุพล อาษาพนม, ศิริลักษณ์ ประภาศรีวรกุล, เชิดศักดิ์ ไอรมณีรัตน์, วรมินทร์ เหรียญสุวรรณ, วิรุณ บุญนุช, ดรินทร์ โล่ห์ศิริวัฒน์

วัตถุประสงค์: เพื่อศึกษาสาเหตุ วิธีการรักษาและผลการรักษาภาวะรอยเชื่อมต่อระหว่างไส้ตรงกับช่องคลอด (rectovaginal fistula) ในโรงพยาบาลศิริราช

วัสดุและวิธีการ: ผู้นิพนธ์ได้ทำการทบทวนข้อมูลย้อนหลังของผู้ป่วยที่มีภาวะรอยเชื่อมต่อระหว่างไส้ตรงกับช่องคลอดที่เข้ารับการรักษาในภาควิชาศัลยศาสตร์ คณะแพทยศาสตร์ศิริราชพยาบาล ตั้งแต่ปี พ.ศ. 2537 ถึง พ.ศ. 2556 โดยรวบรวมข้อมูลต่างๆ เช่น ลักษณะผู้ป่วย สาเหตุ วิธีการรักษาและผลการรักษา

ผลการศึกษา: การศึกษานี้มีผู้ป่วย 108 ราย อายุเฉลี่ย 50 ปี (ตั้งแต่ 24 ถึง 81 ปี) การได้รับรังสีรักษาบริเวณเชิงกราน เป็นสาเหตุที่พบบ่อยที่สุด (ร้อยละ 44) ตามด้วยมะเร็งในช่องเชิงกรานระยะลุกลามเฉพาะที่ (ร้อยละ 20) ภาวะแทรกซ้อนหลังผ่าตัด (ร้อยละ 16 ซึ่งเป็นการผ่าตัด low anterior resection 10 ราย, hysterectomy 5 ราย, stapled hemorrhoidopexy 1 ราย และ injection sclerotherapy 1 ราย) และเกิดหลังคลอด (ร้อยละ 11) การทำทวารเทียมทางหน้าท้องเป็นการผ่าตัดที่ทำบ่อยที่สุดในรักษาภาวะรอยเชื่อมต่อระหว่างไส้ตรงกับช่องคลอดที่เกิดจากการได้รับรังสีรักษาและเกิดจากมะเร็งในช่องเชิงกรานลุกลาม ภาวะรอยเชื่อมต่อระหว่างไส้ตรงกับช่องคลอดหลังผ่าตัดส่วนใหญ่หายได้หลังทำทวารเทียมทางหน้าท้องร่วมกับการผ่าตัดปิดรอยเชื่อมต่อ ภาวะรอยเชื่อมต่อระหว่างไส้ตรงกับช่องคลอดหลังคลอดทั้งหมดหายได้หลังผ่าตัดปิดรอยเชื่อมต่อ ซึ่งบางครั้งทำร่วมกับการเย็บซ่อมหูรูดทวารหนัก

สรุป: การได้รับรังสีรักษาบริเวณเชิงกรานและมะเร็งในช่องเชิงกรานระยะลุกลามเฉพาะที่ เป็นสาเหตุที่พบบ่อยที่สุดในการเกิดภาวะรอยเชื่อมต่อระหว่างไส้ตรงกับช่องคลอด การทำทวารเทียมทางหน้าท้องเป็นการผ่าตัดเบื้องต้นหรือเป็นการรักษาหลักในผู้ป่วยกลุ่มนี้ การผ่าตัดปิดรอยต่อได้ผลดีในกรณีที่ภาวะรอยเชื่อมต่อระหว่างไส้ตรงกับช่องคลอดเกิดหลังผ่าตัดหรือหลังคลอด