Original Article

One or Two Stages Procedure for Repair of Rectovestibular Fistula: Which is Safer? (A Single Institution Experience)

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Abstract

Background: Rectovestibular fistula (RVF) is the most common type of anorectal malformations in females. The need for a diverting colostomy during correction of defect has ignited a heated debate. In this study, we reviewed the girls with RVF that had been treated by either one or two stage procedure in the past 10 years in our institution to define whether one stage or two stage procedures is safer and more beneficial for the patients. **Materials and Methods:** Seventy girls with RVF that had been operated from January 2005 to January 2015 were studied retrospectively. Data were obtained from medical hospital records. The cases were divided into two groups. Group A (46 patients): were operated by two stages technique (simultaneous sigmoid colostomy and anterior sagittal anorectoplasty [ASARP]). Group B (24 patients): were operated by one stage (ASARP without covering colostomy). The short-term outcome as regard wound infection, wound dehiscence, anal stenosis, anal retraction, recurrence of fistula as well as complications of colostomy was reported. The long-term outcome as regard soiling, constipation and voluntary bowel movement was evaluated. **Results:** The age of patients at the time of surgery ranged from 3 months to 2 years (mean; 9.5 months). In Group A, seven patients (15.2%) developed wound infection, two patients developed wound disruption. One patient developed anterior anal retraction and required redo-operation, anal stenosis was noticed in five (10.9%) patients. Complications from colostomy had occurred in nine patients (19.5%). In Group B, wound infection occurred in ten patients (41.7%). Seven patients (29.2%) developed wound disruption. Anal stenosis occurred in eight patients (33.3%). Five patients required redo-operation because of anal retraction in three patients and recurrence of fistula in the other two patients. Constipation recorded in 15 patients (32.6%) of Group A and in ten patients (41.3%) of Group B. Soiling was reported in six girls (13.04%) of Group A and five girls (20.8%) of Group B. **Conclusion:** The avoidance of colostomy is not outweighed achieving sound operation and continent child. Two stages correction of RVF is safer and more beneficial than one stage procedure, especially in our locality and for our paediatric surgeons during their learning curve.

Keywords: Anorectal anomalies, anterior sagittal anorectoplasty, colostomy, rectovestibular fistula, two stages repair of rectovestibular fistula

Introduction

Rectovestibular fistula (RVF) is the most common type of anorectal malformations (ARMs) in females.[1] Most reports categorise RVF as a low anomaly; however, Heinen has considered RVF as an intermediate anomaly.[2] Meticulous examination of the newborn genitalia is paramount for accurate diagnosis. In the case of RVF, the rectum opens immediately behind the hymen in the vestibule of the female genitalia.[3] Several techniques have been described for correction of RVF; nevertheless, posterior sagittal anorectoplasty (PSARP) described by Pena and anterior sagittal anorectoplasty (ASARP) introduced by Okada are still the most common used techniques.[4-6]

The need for a diverting colostomy during correction of RVF has ignited a heated debate. On the one hand, one stage repair for RVF (without colostomy) has been accepted by many authors as a well-recognised trend in the management of RVF, especially in neonates where a single neonatal primary operation is safe with minimal complications.[6-9] On the other hand, two stages repair (with colostomy) was recommended by others to avoid the wound complications that may compromise the functional outcome.[10,11]

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In this study, we reviewed the girls with RVF that had been treated by either by one or two stages procedure in the past 10 years and reported the early post-operative results and the long-term functional outcome to define whether one stage or two stages procedure is safer and more beneficial to the patients.

Materials and Methods

This is a retrospective study of seventy girls who had RVF and admitted in the paediatric surgery unit, Zagazig University, Egypt for surgical correction, during the period from January 2005 to January 2015. Data were obtained from the medical hospital records, follow-up sheets and feedback from the treating surgeons.

After hospital admission, all patients subjected to meticulous clinical examination and routine laboratory investigations. Abdominal ultrasound was performed to exclude associated renal anomalies. Echocardiography was only requested for patients with suspected cardiac lesions.

Pre-operative total bowel irrigation was started 24 h before surgery, using saline 0.9% (20 ml/kg/h) and continued until the effluent became clear. The patients were given clear fluids and kept nil per oral (NPO) 6 h before surgery. Intravenous cephalosporin and metronidazole were started at the night of operation and continued for 3–7 days after operation (average 5 days).

ASARP was the technique of choice used during surgery. The cases were divided into two groups. Group A (46 patients): were operated by two stages technique (simultaneous sigmoid colostomy and ASARP). Group B (24 patients): were operated by one stage (ASARP without covering colostomy).

Oral feeding was started after regaining of the intestinal motility in patients with colostomy; however, in patients without colostomy, total parenteral nutrition was started, in the 1st post-operative day, as the patients were kept fasting for 5–7 days. An indwelling urinary catheter placed at operation and removed after approximately 3–4 days. Wound care was done by povidone-iodine and antibiotic ointment. Patients were discharged when resumed full oral feeding. The length of hospital stay after the correction of RVF ranged from 3 to 10 days (average 5 days).

The patients were followed up in the outpatient clinic weekly for 1 month then every 3 months for 1 year, then every year till the child became toilet trained. Anal dilatation was started 2 weeks after the operation as per the Pena scheme.[3] In patients with colostomy, stoma closure was done after 6–8 weeks. During the follow-up visits, the patients were examined to detect perineal excoriation, wound infection, wound dehiscence, anal stenosis or anal retraction, recurrence of fistula as well as complications of colostomy. The long-term outcome as regard soiling, constipation and voluntary bowel movement was evaluated according to Krickenbeck International score.[12]

Statistical analysis

After data collection, data were coded, entered and analysed using Statistical Package for Social Science version 19 [SPSS Statistics, is a software package used for statistical analysis. Long produced by SPSS inc, it was acquired by IBM in 2009]. Descriptive statistics were used such as percentages for qualitative variables and arithmetic mean and range for quantitative variables. Analysis of data was performed through the use of several statistical tests as Chi-square and Fisher exact tests which were used to statistically analyse the differences between qualitative variables, *t*-test was used to statistically analyse the differences between arithmetic means. *P* (<0.05) was considered statistically significant difference and *P* (≤0.01) was considered the highly significant difference.

Results

Seventy girls were surgically treated for RVF by ASARP. The age of patients at the time of surgery ranged from 3 months to 2 years; the mean age was 9.5 months (8.6 months in Group A and 11.2 months in Group B). The total operative time of Group A (including colostomy closure) ranged from 180 to 240 min (mean; 210 min), whereas, in Group B, it ranged from 70 to 110 min (mean; 85 min). This difference was highly statistically significant.

The total length of hospital stay in Group A (including colostomy closure) ranged from 9 to 14 days (mean; 11.4 days); however, in Group B, it ranged from 6 to 10 days (mean; 6.8 days). This difference was highly statistically significant [Table 1].

Thirty-three patients (47.1%) developed post-operative complications during the short-term follow-up, 18 patients (39.1%) in Group A and 15 patients (62.5%) in Group B [Table 2].

Table 1: Demographic data

Variable	Mean±SD		*P*
	Group A	Group B	
Mean age (months)	8.6±1.2	11.2±1.1	<0.0001
Total operative time (min)	210±15.6	85±11.2	<0.0001
Total hospital stay (days)	11.4±0.9	6.8±0.6	<0.0001

SD: Standard deviation

Table 2: Early post-operative complications

Complications	*n* (%)		*P*
	Group A (46)	Group B (24)	
Perineal excoriation	0	9 (37.5)	0.00004
Wound infection	7 (15.2)	10 (41.7)	0.03
Wound disruption	2 (4.3)	7 (29.2)	0.01
Anal stenosis	5 (10.9)	8 (33.3)	0.05
Anterior anal retraction	1 (2.1)	3 (12.5)	0.2
Recurrence	0	2 (8.3)	0.2
Complicated colostomy	9 (19.5)	0	0.03
Total	18 (39.1)	15 (62.5)	0.1

Table 3: Long-term bowel function

Bowel function	*n* (%)		*P*
	Group A	Group B	
1. Voluntary bowel movements			
Feeling of urge	32/46 (69.6)	16/24 (66.7)	0.98
Capacity to verbalise	29/46 (63.04)	15/24 (62.5)	0.82
Hold the bowel movement	Could not be determined		
2. Soiling			
Grade 1: Occasionally (once or twice per week)	6/46 (13.04)	4/24 (16.7)	0.93
Grade 2: Every day, no social problem	None	1/24 (4.2)	0.68
Grade 3: Constant, social problem	None	None	1
3. Constipation			
Grade 1: Manageable by changes in diet	None	None	1
Grade 2: Required laxatives	15/46 (32.6)	10/24 (41.3)	0.62
Grade 3: Resistant to diet and laxatives	None	None	1

The incidence of wound infection was statistically significant between the two groups ($P = 0.03$). In Group A, seven patients (15.2%) developed wound infection. Five patients improved by antibiotics, whereas two patients complicated by wound disruption (one developed anterior anal retraction and required redo-operation, whereas the other developed anal stenosis that responded to dilatation). In Group B, wound infection occurred in ten patients (41.7%). Three patients (12.5%) responded to antibiotics and seven patients (29.2%) developed wound disruption that necessitates sigmoid colostomy. The incidence of wound disruption between the two groups was highly statistically significant ($P = 0.01$).

Anal stenosis in Group A, was noticed in five patients (10.9%), three of them responded to the regular anal dilatation, one required Y-V anoplasty and the other one performed redo-operation because of associated anterior anal migration. However, in Group B, Anal stenosis occurred in eight patients (33.3%), three responded to regular anal dilatation but five required redo-operation because of the occurrence of anal retraction in three patients and recurrence of fistula to its initial position inside the vestibule in the other two patients.

Complications from colostomy had occurred in nine patients (19.5%) of Group A, prolapsed colostomy recorded in three patients and six patients had parastomal excoriation. All patients responded to conservative management.

Perineal excoriation was not recorded in Group A. While, in Group B, nine patients (37.5%) developed mild perineal excoriation that responded to local treatment.

The long-term bowel function was assessed [Table 3]. Constipation recorded in 15 patients (32.6%) of Group A and in ten patients (41.3%) of Group B. All patients were Grade II and responded well to the dietary management in addition to laxatives. Soiling was reported in six cases (13.04%) of Group A, five improved by the management of constipation and the other one who had redo-operation suffered from persistent occasional soiling. In Group B, five patients (20.8%) had soiling, four of them who had redo-operation, suffered from persistent soiling while one improved by the management of constipation.

The voluntary bowel movement was assessed in our patients after the age of 3 years. It could be seen in 48 (68.6%) patients, 32 (69.5%) in Group A and 16 (66.7%) in Group B. All patients had good feeling of urge to use the toilet.

Discussion

RVF in females has been treated by different methods with variable modifications.[5,13] Many centres, including our institution, have preferred ASARP. They claimed that ASARP has many advantages over limited PSARP. First, mobilisation of rectum from vagina under direct vision is easier. Second, avoidance of levator ani muscle division which preserves the continence mechanism. Third, accurate reconstruction of both sphincteric muscle and perineal body. In addition, the limited PSARP is associated with excessive perirectal dissection and is likely to cause changes in the external appearance of the anus, as well as changes in bowel control and manometric parameters.[14-16]

Some authors have preferred two stages rather than one stage procedure for the repair of RVF. They stated that the occurrence of perineal wound complications would compromise the functional outcome in this type of defect that has a good functional prognosis. Therefore, colostomy has been advised to get the best results.[10,17] However, others argued that one stage repair of RVF is feasible, safe and has a lot of advantages. Anorectoplasty without colostomy means avoidance of colostomy-related complications and two operations with a reduction of the hospital stay and financial cost.[6,17-21] In addition, wound contamination could be minimised by aggressive cleansing of the bowel by pre-operative total bowel irrigation and NPO for the first 5 post-operative days.[17]

The aim of our study was to compare the results of one stage versus two stages repair, in our institution, to assess the safety, pros and cons of both techniques. Most of the studies reported

that the rate of wound infection ranged from 4% to 11%.[9,22] In this study, the rate of wound infection was significantly higher in Group B (41.7% in Group B versus 15.2% in Group A). This higher rate in our series could be attributed to two reasons. First, our patients were older with higher risk of contamination; however, most of the patients in the other series were operated during neonatal period where the risk of contamination is lower. Second, most of our patient's parents were from rural area with low socioeconomic level and bad hygiene.

In our results, wound disruption was higher in Group B than Group A (29.2% vs. 4.3%), this difference was statistically significant. These results are in concordance with Elsaied *et al*., who reported that wound disruption was higher in one stages procedure than two stage, it was 40% and 13%, respectively.[21]

Recent researches concluded that meticulous dissection results in less tissue trauma and hematoma with adequate rectal mobilisation so that surgeon experience is a critical factor in improving the results of single stage correction of RVF.[18] In concordance, in our research, we noticed that the incidence of wound infection and its sequelae was higher among the patients of Group B who were operated by junior staff of paediatric surgeons during their learning curve. The excellent results of many published studies encouraged our junior surgeons to do one stage procedure without taking into consideration that RVF anomaly is a complex and not a simple one as it appears. If proper reconstruction is not done at the first attempt, the chance of failure is high and leads severe sequelae. Hence, correction of this defect without covering colostomy might result in disruption of the whole repair.

In our study, although post-operative dilatation was done for both Groups A and B as a routine to avoid anal stenosis[3,11,20] still the rate of anal stenosis was higher in Group B than Group A (33.3% and 10.9%, respectively). We suggested that this higher rate is mainly because the rate of wound complications was higher in Group B and to lesser extent due to non-compliance of some patients.

In our study, five out of eight patients (20.8%) in Group B required redo ASARP while in Group A only one patient (2.1%) required redo. This result is statistically significant and matches with the results of other study. Elsaied *et al*. reported that 40% of patients treated by one stage procedure required redo PSARP while none of the patients treated by two stage procedure needed redo and they considered the advantages of one stage correction of RVF is overrated.[21]

Patients with RVF usually have well-developed muscles and nerves. The prognosis have been considered good in the term of bowel function and continence if they are properly treated.[7] In our study, the late outcome regarding constipation, soiling and voluntary bowel movement had been assessed using Krickenbeck International system.[12]

Constipation is an early common problem in children operated for low ARM accounting for about 40% to 50% of patients.[2,10,23] The rate of constipation in our series was 35.7% (32.8% in Group A and 41.3% in Group B) with no statistical significance. All patients were grade II and responded to dietary management and laxative.

Some series reported that approximately 90% of patients with corrected RVF will develop normal continence by the age of 3 years.[11,14] Others have reported some incidence of occasional or frequent soiling in their patients.[4] In this study, the voluntary bowel movement could be assessed only in 48 patients (68.6%) who attained the age of potty control (3 years) at the time of assessment of continence (69.5% in Group A 66.7% in Group B). All of these patients had normal voluntary bowel movement. However, soiling was observed in 13.04% of patients in Group A and 20.8% in Group B. Six of these patients had overflow incontinence that improved after the adequate treatment of constipation. However, five patients, one in Group A and four in Group B who had ASARP revision still suffered from persistent soiling.

Conclusion

The need for colostomy in the patients with RVF is debatable. The avoidance of colostomy is not outweighed achieving sound operation and continent child. Despite the decision of colostomy is not preferred by many authors, we believe that the two stages correction of RVF is safer and more beneficial than the one stage, especially in our locality and for our paediatric surgeons during their learning curve.

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Conflicts of interest

There are no conflicts of interest.

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