

Assessment of Bowel Function After Corrective Surgery for Anorectal Malformation. A Single Institution Study

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Abstract

The components of bowel function outcome as described in the Krickenbeck classification are: voluntary bowel function, constipation and soiling. The objective of this study was to assess the outcome on bowel function of children after corrective surgery for Anorectal malformations at a tertiary hospital setting. This was a single institution descriptive study conducted at Kenyatta National hospital in Kenya. The study recruited 25 participants who had ARM repair between the year 2000 and 2010 and the outcome of bowel function was assessed using the Krickenbeck scoring system. Voluntary bowel function was present in 84% of participants. Soiling grade 1(n=5) and grade 2 (n=2) was associated with pseudo-incontinence due to constipation while soiling grade 3(n=4) was seen in participants with true incontinence and was associated with high anomalies. Re operations were done in 10 participants of which only 30 % achieved normal bowel control.

Key words: Anorectal malformation; Outcome; Bowel function.

Introduction

The success rates in corrective surgery for Anorectal Malformations (ARM) has improved significantly because of better understanding of the pathological anatomy and physiology of these defects. Modern surgical techniques have also played a significant role in the improved outcomes [1]. However, a significant population of patients continue to suffer from defective bowel control way into their adulthood [2]. The components of bowel function outcome as described in the Krickenbeck classification are: voluntary bowel function, constipation and soiling [3].

The objective of this study was to assess the outcome on bowel function after corrective surgery for ARM with an aim to provide useful indicators and parameters needed by the multidisciplinary team involved in the bowel management program for children with bowel dysfunction after surgery as to improve their Quality of life.

Materials and Methods

This was a single institution descriptive follow up study which recruited 25 participants who had ARM repair between the year 2000 and 2010 at the Kenyatta National Hospital which is a tertiary facility and the major referral hospital for paediatric surgical cases in Kenya. All participants were above 4 years of age at the time of recruitment and had completed all 3 stages of surgery. All participants who met the inclusion criteria were enrolled in the study after giving informed and written consent. Ethical approval was sought and granted by the institutional ethics committee.

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Table 1: Participant Characteristics

Characteristic	Anomaly	Fx(N=25)	%(N=100%)
Sex	Male	14	56%
	Female	11	44%
Type of Defect	Recto-vestibular fistula	11	44
	Recto-urethral Bulbar fistula	4	16
	Recto-urethral Prostatic fistula	4	16
	Recto-perineal fistula	3	12
	No fistula	2	8
	Recto-vesical fistula	1	4
Associated Anomalies	Genito urinary	3	12
	Vertebral	2	8
	Isolated ARM	20	80
Type of surgery	PSARP	15	60
	ASARP	8	32
	Abdomino-perineal pull-through	1	4
	Anoplasty	1	4
PSARP (Posterior Sagittal Anorectoplasty) ASARP (Anterior Sagittal Anorectoplasty)			

Data collected included participant characteristics, type of surgery and bowel function after surgery. The outcome measures were scored according to the Krickenbeck scoring system [3]. Data was entered in SPSS (V.21 Chicago-Illinois) and presented in form of descriptive frequencies.

Results

Participant characteristics

A total of 25 participants were recruited in the study. The mean age of our participants was 6 years with a range between 4 years and 15 years. The distribution according to sex, type of anomaly, associated anomalies and type of surgery are shown in Table 1.

Bowel Function

A total of 14 (56%) participants had good bowel function of which 92 % had low malformations. A total of 21 (84 %) participants had voluntary bowel control. Bowel dysfunction was present in 11 participants who had soiling. Of these, 4 participants had true incontinence with grade 3 soiling while 7 participants had pseudo-incontinence due to constipation with grade 1(n=5) and grade 2(n=2) soiling. Consequently, 7 participants had constipation as shown in Table 2.

Re-Operations

Re operations were done in 10 participants. The indications for reoperation are shown in the table below. The most common indication was ectopic neo anus. Only 30% of participants reported good bowel function after redo surgery and these included 2 participants with mucosal prolapse and 1 with ectopic neo anus. Table 3 summarises the indications and reoperations done.

Discussion

Assessment of outcome post corrective surgery for Anorectal Malformation is a good marker to determine the quality of surgical care offered to this group of patients. The long-term goal for these patients is to be faecally continent and to have normal bowel movement. This study assessed the outcome of 25 participants with ARM after corrective surgery and aged between 4 years and 15 years.

Voluntary Bowel Control

Overall 84 percent of participants had voluntary bowel control. The level of anomaly is an important prognostic factor in terms of bowel control with excellent outcomes in patients with low anomalies. In this study 92% of low anomalies had good bowel function. Nixon et al and Rintala et al record a rate of voluntary bowel control between 74% and 64% [4,5]. Karkowski also reported good continence in 12 (80%) of his 15 patients with low malformations [6].

Constipation

Constipation is described as the most common complication seen in 40% of those with low anomalies [5,7,8]. This study observed constipation in 24% of the participants. Half of these participants had soiling due to pseudo-incontinence. Constipation is thought to arise from hypo-motility of the distended recto-sigmoid colon and the extensive mobilization of the ano-rectal region which may cause partial sensory denervation of the rectum and impair the awareness of rectal fullness [9].

Soiling

Soiling was described in 44% of participants. Most of the soiling was as a result of pseudo-incontinence related to constipation. In 4 participants who had true incontinence grade 3 soiling was imminent. Rintala found 83% of patients with high Anorectal Malformation reported social disability due to incontinence [10]. In this study there

Table 2: Bowel Function After ARM Surgery

Outcome	Grade	Frequency N=17
Voluntary bowel function	Voluntary	21(84%)
	Involuntary	4 (16%)
Total		25 (100%)
Soiling	Grade 1	5
	Grade 2	2
	Grade 3	4
Total		11 (44%)
Constipation	Grade 1	4
	Grade 2	1
	Grade 3	2
Total		7 (28%)

Table 3: Re-operation after ARM surgery

Indication	Surgery	Fx (n=10)	%
Ectopic Neo -anus	Transfer anoplasty	7	28%
Anal stricture	Mini psarp	1	4%
Mucosal prolapse	Mucosectomy	2	8%
Total		10	40%

were 5 participants with high anomalies of which 4(80%) participants reported involuntary bowel control and grade 3 soiling. Incontinence is thought to arise from abnormalities in development of the pelvic musculature, sacral nerves, spinal cord and sacral bone. According to Bischoff et al 25% of all patients with ARM, regardless of the quality of the treatment that they receive, suffer from fecal incontinence [11].

Re-operations

Re-operations are offered to improve bowel control or to repair an anatomic problem consecutive to a surgical complication [12]. These complications include anal stricture, acquired anorectal atresia, ectopic neo anus, rectal prolapse, posterior urethral diverticulum, and persistent urogenital sinus in patients with cloaca. In this study 10 participants underwent re-operations; 7 participants due to ectopic neo anus; 1 participant due to anal stricture and 2 participants due to mucosal prolapse. Bischoff et al emphasize the importance of having the first surgical procedure done correctly as evidenced by the fact that only about 50% of patients re-operated following these indications reported a significant improvement in fecal control [12]. In our study only 30% had normal bowel function.

Conclusion

Bowel function following surgery for anorectal malformation is an important factor in long term outcome of patients. Low malformations are associated with constipation while high malformations are associated with true incontinence. Re-operations after initial surgical repair of ARM are associated with poor functional outcomes.

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