

# Constipation after Surgery for Anorectal Malformations: Unrecognised Problem until It is a Problem

Vijai D. Upadhyaya, Laxmi K. Bharti<sup>1</sup>, Ashwani Mishra, Mohd. Yousuf, Prabhakar Mishra<sup>2</sup>, Basant Kumar

Departments of Pediatric Surgical Superspecialties,<sup>1</sup>Pediatric Gastroenterology and <sup>2</sup>Biostatistics, Sanjay Gandhi Institute of Medical Sciences, Lucknow, Uttar Pradesh, India

## Abstract

**Background:** Constipation is a common problem after surgery for anorectal malformations (ARMs), especially in patients having preserved rectosigmoid after pull-down surgery. Here, we present our experience with patients having constipation after surgery for ARMs and briefly discuss its management. **Materials and Methods:** We retrospectively reviewed electronic operative and follow-up data from January 2015 to December 2019 of all patients having constipation after surgery for ARMs. **Results:** A total of 77 patients were included in the study. The median age was 60 months, and thirty patients were male. Primary diagnoses were rectourethral fistula (26; 33.77%), vestibular fistula (25; 32.47%), perineal fistula/ectopic anus (18; 23.38%), rectovaginal fistula (4; 5.19%) and imperforate anus without fistula (4; 5.19%). Anal stenosis was found in 20 (25.97%) patients, posterior ledge with an adequate anal opening in 5 (6.49%), displaced anus in 4 (5.19%) but no obvious problem found in 48 (62.34%) patients. Non-operative management was successful in 75.44% (43 out of 57) of patients. Surgery was performed in 32 out of 77 patients (41.56%) with no mortality. Forty-three (72.88%) patients are continent, stayed clean, but 16 (27.19%) patients still need some sort of laxative/bowel wash/enema intermittently (Grade I/II constipation). Incidence of constipation was higher in patients operated through anterior sagittal route (27.58%) than posterior sagittal route (23.94%), but it was not statistically significant ( $P = 0.479$ ). Follow-up ranged from 3 months to 5 years. **Conclusion:** Constipation is a common problem after ARMs surgery, especially in patients having preserved rectosigmoid after pull-down surgery. It is advisable to create relatively larger neorectum after pull through with early practice of neorectum dilatation, especially in redo cases. Repeated counselling, laxatives and dietary manipulations should begin at the first sign of constipation.

**Keywords:** Anorectal malformations, bowel management programme, constipation, redo-surgery

## INTRODUCTION

Constipation is a common problem encountered in the follow-up of patients with anorectal malformations (ARMs) after surgery. It is most common in patients having preserved rectosigmoid after pull-down surgery for ARMs.<sup>[1,2]</sup> This constipation after surgery occurs due to mechanical or functional reasons. Inadequate treatment can result in mega rectum/mega rectosigmoid and can lead to faecal impaction and overflow incontinence.<sup>[3]</sup> It is a well-established fact that long-term constipation may lead to urinary problems.<sup>[2-5]</sup> In practice, this common problem is usually unrecognised/ignored by parents and sometime treating physician until it becomes a major problem. It causes a negative impact on physical, behavioural and psychosocial growth of the child. Recurrent urinary problems associated with constipation may lead to growth failure in children.<sup>[2-8]</sup>

Here, we present our experience with patients having constipation after surgery for ARMs and briefly discuss its management.

## MATERIALS AND METHODS

We retrospectively reviewed the follow-up records from January 2015 to December 2019 of all patients operated for ARMs, either in our institute or outside, who presented to us with the complaint of constipation in the outpatient department.

**Address for correspondence:** Dr. Basant Kumar,

Department of Pediatric Surgical Superspecialties, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Raibareli Road, Lucknow - 226 014, Uttar Pradesh, India.  
E-mail: drbkg75@rediff.com

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Data analysed were pertaining to the age at presentation, sex, clinical presentation, diagnostic evaluation done, need of revision surgery, management, post-operative problems and follow-up results. In these cases, the Krickenbeck protocol was used for assessment.<sup>[9]</sup>

**Inclusion criteria**

All patients with a complaint of constipation after surgery for ARMs, aged more than 3 years (toilet trained) and who were followed up for more than 3 months were included in this study.

**Exclusion criteria**

Patients whose records were deficient, aged <3 years (toilet untrained) or who could not be followed up for more than 3 months were excluded from the study.

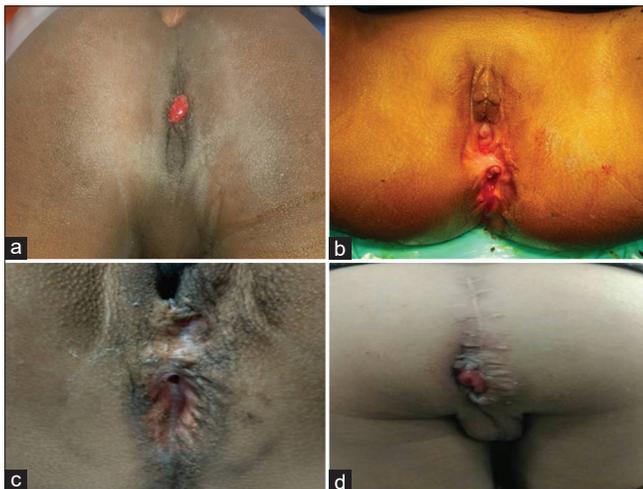
Clinical presentations at the time of referral were constipation, difficult defecation and urination or stool impaction with faecal and urinary overflow incontinence. After initial counselling, all patients were evaluated clinically. Patients suspected of having mechanical problems were investigated radiologically including X-ray, ultrasonography (USG) and water-soluble contrast enema to delineate the anatomy. Patients having mechanical obstruction were re-operated after informed consent from the parents/guardians and followed up according to the method established by the Krickenbeck in 2005 for the assessment of outcome.<sup>[9]</sup>

Bowel management programme (BMP) includes complete disimpaction of faecoliths and emptying of the colon by the use of enemas and rectal washouts as a first step. Sometimes, the use of nasogastric polyethylene glycol (PEGLEC) solution was required. Repeated counselling and reassurance of parents/guardian and patients was required. Toilet training and dietary changes were cornerstones of management. High fibre, protein-rich diets were usually recommended. We dewormed the patients and taught them for judicious use of laxatives and progressively decreasing use of enemas/bowel washes

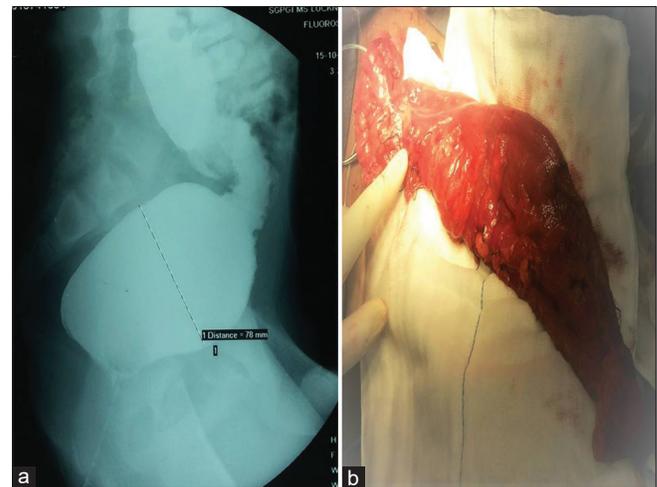
in the follow-up. We routinely use some sort of BMP in the 1<sup>st</sup> month of follow-up and variable period of anal dilatation after neoanus reconstruction. We maintained follow-up cards of each patient by asking leading questions and recorded the complaints/satisfaction of the parents and patients of variable intelligence.

**RESULTS**

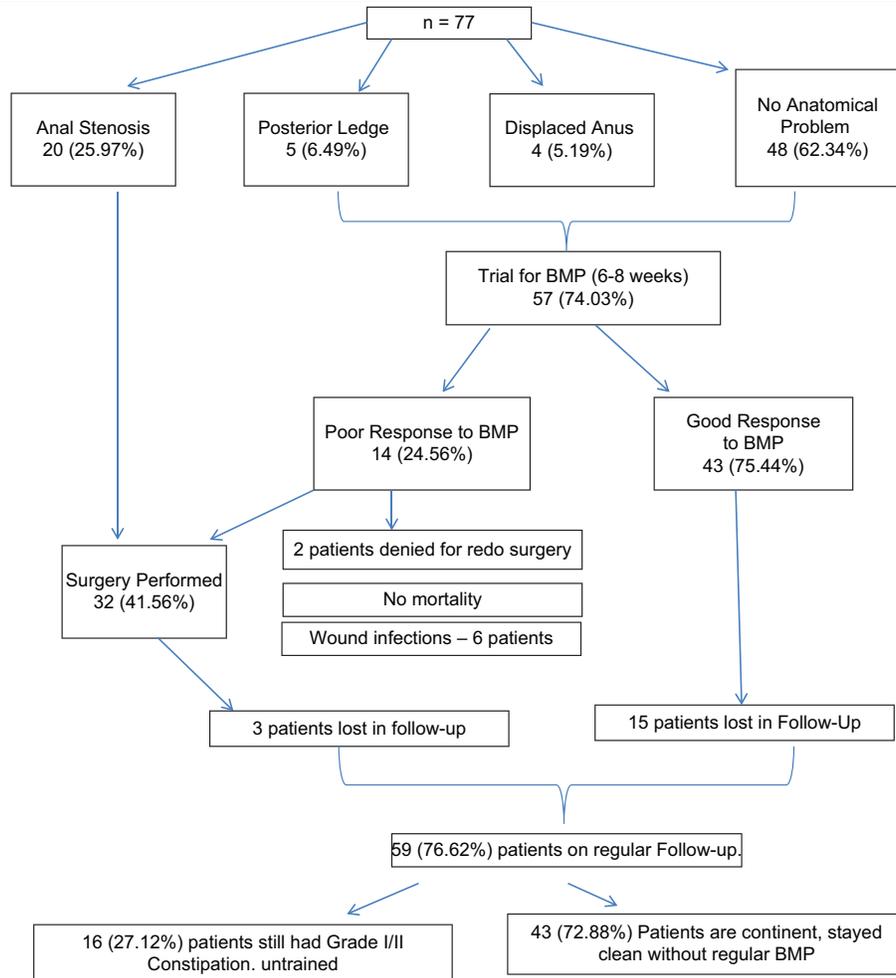
From January 2015 to December 2019, a total of 286 patients were operated on for ARMs in our single unit of the Department of Pediatric Surgical Superspecialties, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, in which 65 (22.73%) patients developed constipation during follow-up. Eighteen patients with a complaint of constipation were operated one outside/elsewhere and then subsequently represented to our outpatient department. These 83 operated patients (65 operated by us and 18 operated elsewhere) of ARMs with preserved rectosigmoid presented with a primary complaint of constipation. Six out of 83 patients were <3 years of age and were not toilet trained, hence excluded from the study. A total of 77 patients were included in the study. Their ages ranged from 38 months to 168 months (median – 60 months) and thirty patients were male. Primary diagnoses were rectourethral fistula (26; 33.77%; 8 rectoprostatic and 18 bulbourethral), vestibular fistula (25; 32.47%), perineal fistula/ectopic anus (18; 23.38%), rectovaginal fistula (4; 5.19%) and imperforate anus without fistula (4; 5.19%). In these 77 patients, 58.44% (45) of patients were operated by the posterior sagittal route and the rest 41.56% (32) of patients were operated on by the anterior sagittal route. Presenting complaints were excessive straining/crying during defecation and passing hard stools usually once every 2–3 days. Sixteen (20.78%) patients had complaints of stool impaction and soiling, whereas ten (12.99%) patients had complaints of difficult urination too. Almost all patients were using some sort of medication/laxatives/enema on an irregular basis.



**Figure 1:** Posteriorly displaced, stenotic neoanus (a) and laterally placed, non-stenotic angulated neoanus (d) in males while anteriorly displaced, stenotic (b) and non-stenotic (c) neoanus in females



**Figure 2:** Contrast enema showing dilated rectosigmoid of pulled bowel (a) and operative picture showing dilated rectosigmoid (b)

**Table 1: Flow chart of results**

BMP = Bowel Management Program (reassurance, dis-impaction of fecoliths, rectal washouts/enema/peglec, dietary changes, toilet training, etc.)

A detailed history of each patient was taken with emphasis on dietary habits, defecation and urination. Each patient was thoroughly examined. Twenty-eight (36.36%) patients were underweight (<5<sup>th</sup> percentile), whereas three (3.89%) patients had weight <3<sup>rd</sup> percentile. Anal stenosis was present in twenty (25.97%) patients (male – 8; female – 12), whereas five (6.49%) patients (male – 3; female – 2) had a significant posterior ledge with the adequate anal opening. A displaced anus was observed in four (5.19%) patients (male – 2; female – 3) [Figure 1]. No obvious anatomical problem found in the rest of patients [48; 62.34%].

In all patients (57) except those with anal stenosis (20), BMP (reassurance, disimpaction of faecoliths, rectal washouts/enema/PEGLEC, dietary changes, toilet training, etc.) was tried for 6–8 weeks. Forty-three (75.44%) out of 57 patients responded well to BMP and did not require further surgery, whereas 14 (24.56%) patients (M-8; F-6) with poor compliance to BMP remained symptomatic after trial of conservative management.

These patients underwent further radiological evaluation (USG of abdomen with X-ray abdomen and spine). Only one patient had partial sacral agenesis. Water-soluble contrast study showed dilated rectum/rectosigmoid in 13 patients [Figure 2].

In this cohort, 37.66% (29) of patients had an anatomical narrowing/ledge at neoanus site (anal stenosis – 20, posterior ledge – 5 and displaced anus – 4) which were diagnosed easily after detailed careful examinations only. Nearly 75.44% (43 out of 57) of patients responded well after BMP and had good bowel control in follow-up (twenty patients with anal stenosis were excluded from the BMP trial). Around 24.56% (14 out of 57) of patients remained symptomatic (partial response) after the BMP trial, in which 11 patients had known anatomical problems (posterior ledge – 5 and displaced anus – 4). Only five patients without any mechanical problem did not respond to BMP trial.

Surgery was planned in 34 patients (for anal stenosis – 20, posterior ledge – 5, displaced anus – 4 and with dilated rectum/

rectosigmoid – 5) but parents/guardian of two patients were denied/not consented for revision surgery. Finally, surgery was performed in only 32 patients. Anoplasty (13), minimum PSARP (11), ASARP (5) and PSARP with excision of dilated rectum (3) were performed in these patients. There was no mortality in this cohort. Superficial wound infections were observed in six patients. All patients were kept on anal dilatation and BMP for variable periods after redo surgery at our institute. Eighteen patients were lost to follow-up (only three patients from an operated group). Rest 43 out of 59 (72.88%) patients are doing well (continent, stayed clean without regular BMP) but 16 out of 59 (27.19%) patients still need some sort of laxative and bowel wash/enema intermittently (Grade I/II constipation) [Table 1-Flow chart of result]. The incidence of constipation was higher in patients operated through the anterior sagittal route (27.58%) than the posterior sagittal route (23.94%), but it was not statistically significant ( $P = 0.479$ ). Four patients needed anticholinergic drug (*oxybutynin*) for their urinary problems, whereas 12 patients are still underweight (<5<sup>th</sup> percentile). Follow-up ranged from 3 months to 5 years.

## DISCUSSION

Faecal continence depends on three main factors: sensation within the rectum, good colonic motility and good sphincter control.<sup>[2-4]</sup> The patient with ARM has abnormal voluntary muscles with varying degrees of underdevelopment of the muscle complex.<sup>[2]</sup> Except for patients with rectal atresia, most patients with ARMs are born without an anal canal; therefore, sensation does not exist. It seems that the patient can perceive only distention of the rectum (proprioception). The most important clinical implication of this is that liquid stool or soft faecal material may not be felt by the patient as it does not distend the rectum.<sup>[2-8]</sup>

The exact origin of the problem of constipation is unknown. Nearly 95% of cases of total constipation are functional and only 5% are due to organic reasons.<sup>[10]</sup> Constipation appears to be a hypomotility disorder secondary to chronic bowel dilatation caused by anal stenosis or by angulation/stenosis of anal canal due to anterior displacement that leads to dilatation of proximal bowel. The hypomotility causes dilation, which in turn results in constipation, creating a vicious cycle. Furthermore, it is seen that this problem of constipation is worse in lower defects.<sup>[2-8]</sup> It was also thought that the perirectal dissection caused a degree of denervation that resulted in constipation.<sup>[2-4]</sup>

The other primary factor affecting the degree of constipation appears to be the site of colostomy. In patients with transverse loop colostomies, distal colostogram typically show severe dilation of the rectosigmoid, especially if the closure of the colostomy was delayed for a long period of time. These patients have suffered more severe constipation after repair of the ARM and closure of the colostomy. In fact, there is a direct relationship between the degrees of rectosigmoid dilation with the duration of colostomy closure.<sup>[2-8,11]</sup>

Pull-through procedure and creation of a neoanus in dilated bowel may lead to hitch or ledge at distal most part of posterior wall of pull-through bowel (near neoanus).<sup>[11]</sup> It causes faecal stasis and constipation, leading to chronic dilatation and rectal ectasia/hypomotility of bowel. The greater the dilatation of the rectum, the greater the aggravation of constipation and later, constipation becomes a self-perpetuating and self-aggravating condition. In this cohort, five patients did not have any anatomical/mechanical problem but still did not respond to BMP trial due to a dilated rectum/rectosigmoid. It is an important finding because it denotes hypomotility/ectasia of the dilated proximal bowel due to long-standing constipation. Non-compliance or poor compliance is a subjective finding related with satisfaction of patients/parents/guardians to BMP and the need for frequency/amount of laxative and bowel washing/enema required. Constipation is a very serious problem because eventually it provokes faecal incontinence, even in patients who were born with a potential for a bowel control (overflow pseudo-incontinence).<sup>[4-8,11,12]</sup>

Long-term constipation may lead to urinary problems. The bladder and the distal bowel, both have almost the same nerve supply and the functional abnormality of any organ affects others (bowel and bladder cross talk).<sup>[12]</sup> Loaded colon can compress the bladder neck and cause incomplete bladder emptying. Perineal soiling and the incomplete bladder emptying are leading cause of recurrent urinary tract infections and cystitis. Long-term infection and the outlet obstruction may lead to trabeculated bladder and detrusor-sphincter dyssynergia. Any other associated anomaly in urinary system exaggerates the problems.<sup>[4-8,11,12]</sup>

BMP can eliminate the constipation and the associated urinary problems.<sup>[12]</sup> We also observed it in ten patients who presented with urinary problems including frequency, burning micturition and fever. Incomplete emptying of bladder, dribbling of urine and burning sensation during urination were usual complaints. USG showed evidence of cystitis and thick-walled bladder in six patients, in which four patients needed anticholinergic support. The main problems encountered in BMP for poor compliance are ignorance, illiteracy, variable intelligence of parents/guardians and frequent change of guardians during follow-up.<sup>[2-8,13,14]</sup> Another issue in the management of constipation in post-surgery ARM is its association with Hirschsprung's disease. Although this is very rare, it may coexist and aggravate the problem of constipation.<sup>[15]</sup> Constipation after ARMs surgery needs early attention, but in routine practice, diagnosis is usually delayed. It should be evaluated properly, and the anatomical causes should be treated early. Minor early interventions/surgery or even medication and proper counselling can eliminate this problem.<sup>[13,14]</sup> Rarely, does a massively dilated rectosigmoid needs excision because of ectasia/hypomotility, but it should be avoided to prevent faecal incontinence. Recurrent

constipation and persistent perineal soiling have adverse effect on the physical mental and psychosocial growth of patients.<sup>[7,8,13]</sup>

This study has various limitations because of its retrospective nature and probable selection bias. There were limitations in follow-up too. Results were based on the subjective opinion of parents and patients of variable intelligence and on their satisfaction. In conclusion, constipation is a common problem after ARMs surgery, especially in patients having preserved rectosigmoid after pull-through surgery. It is advisable to create relatively larger neoanus after pull-through procedures because the relative growth of neoanus is less due to local fibrosis which leads to narrowing of neoanus, especially in redo cases.<sup>[13,14]</sup> Neoanus dilatation should be instituted early in the post-operative period for variable lengths of time according to the need.<sup>[14]</sup> The key in these patients is to manage constipation proactively. Mechanical obstruction should remove early. The patients must be followed regularly. Repeated counselling, laxatives and dietary manipulations should begin at the first sign of constipation.

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### Conflicts of interest

There are no conflicts of interest.

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