

# Role of Routine Dilatations after Anorectal Reconstruction—Comparison of Two Tertiary Centers

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## Abstract

**Aim** Regular anal dilatations are commonly recommended in the postoperative management following posterior sagittal anorectoplasty (PSARP) in anorectal malformations (ARM). We hypothesized that routine postoperative dilatations may not affect surgical outcomes following PSARP. We compare surgical outcomes of routine postoperative dilatations versus no routine postoperative dilatations from two United Kingdom tertiary pediatric surgical centers.

**Materials and Methods** This is retrospective records review of patients undergoing definitive surgery for ARM in two tertiary surgical centers in the UK over 5 years. Center A used a protocol of routine postoperative dilatations, and center B used a protocol, which used dilatations only for clinical indications of stricture. Data collected included ARM type, operative procedures, and postoperative interventions. All post-operative interventions under general anesthesia (GA) were compared between groups.

**Results** From 2011 to 2015, 49 procedures (46 PSARPs) were performed in center A and 54 (52 PSARPs) in center B. Median follow up period was 31 months (interquartile range [IQR] 18–48). The first postoperative anal calibration under GA was documented for 43 (86%) patients in center A and for 42 (78%) patients in center B. Following this, center A followed routine postoperative dilatation (RPD) at home, and center B reserved further dilatations for specific indications. RPD was performed for 100% of patients in center A versus 8% in center B. Further anal dilatations under GA were performed in 19 (38%) children in center A and in 17 (34%) children in center B ( $p = 0.68$ ). In center A, 10 patients (22%) needed further surgery versus 14 (28%) in center B ( $p = 0.48$ ).

**Conclusion** The use of routine postoperative dilatations does not significantly improve surgical outcomes following PSARP in ARM.

## Keywords

- ▶ anorectal malformation
- ▶ anal dilatation
- ▶ PSARP

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## Introduction

Anorectal malformations (ARM) are a spectrum of disorders of the rectum and anus characterized by variable anatomy and outcomes. ARM affect approximately 200 newborns per year in the UK with an incidence of 1 in 3,500 to 5,000 live births.<sup>1</sup> The posterior sagittal anorectoplasty (PSARP) was originally described by Peña and Devries in 1982 for high anorectal anomalies and has been widely adopted for a spectrum of ARM. They also recommended routine postoperative dilatations (RPD) of the neo-anus to 'stimulate the normal growth of the rectum thereby gently distending the muscle structures to avoid narrowing or rupture,' and this is now widely practiced by pediatric surgeons worldwide.<sup>2,3</sup>

Some surgeons have challenged the need for daily dilatations following PSARP.<sup>4,5</sup> Others have noted that regular anal dilatations are associated with pain and bleeding and can negatively impact the long-term mental health and psychosocial functioning of the child.<sup>6,7</sup> The aim of our study was to evaluate whether routine postoperative dilatations (RPD) have the advantage of reduced post-operative stricture rates and re-operation rates following PSARP.

## Methods

Patients admitted for surgery at the two tertiary pediatric surgical centers between January 2011 and December 2015 were selected using the international classification of diseases (ICD10) codes for ARM and also by Office of Population Censuses and Surveys Classification of Surgical Operations and Procedures (4th revision) (OPCS 4) codes for procedures for ARM. We excluded patients who had a simple anoplasty as the definitive procedure, those who died before the definitive procedure, had the first definitive procedure outside one of the two study centers, and patients with a diagnosis of cloacal malformation. Retrospective review was conducted on patient records and data collected including demographics, ARM subtype, primary surgical procedure, and post-operative management. The primary outcome measures were needed for repeated dilatations under general anesthesia (GA) and further surgical procedures on the neo-anus.

Both centers aim for similar size neo-anus during the reconstruction appropriate to the age (neonate 10 Hegar and 6 months 12 Hegar). The standard practice in center A has been to follow routine postoperative dilatations in the post-operative period following PSARP. The initial dilatation is performed under general anesthesia, after which the parents are taught to perform dilatations. The parents then continue with twice-daily dilatations until an adequate anal caliber is achieved. In contrast, center B uses dilatations only in those with clinical evidence of stricture. The surgical outcomes from the two groups were compared using the Fisher's exact test. Statistical analysis was performed using GraphPad Prism (v 7.01).

## Results

The initial search on the hospital databases identified 88 patients in center A and 165 patients in center B. Among

these, we excluded 39 patients from center A (3 conservative management, 2 multiple anomalies and died prior to definitive surgery, 1 child with multiple anomalies and ileostomy, 3 awaiting surgery, 1 external center procedure, 7 cloaca, 13 anoplasties, 7 transanal proctoplasties, and 2 laparoscopic assisted anorectoplasties). One hundred and eleven patients from center B were excluded (74 who had definitive surgery at another hospital, 20 children who had repair of cloaca, 11 anoplasties, and 6 children with multiple anomalies who died prior to definitive surgery).

During the 5 years included in the study, 45 PSARPs and 4 mini-PSARPs were performed in center A. Center B had 54 patients (52 PSARPs and 2 mini-PSARPs) during the same period. The demographic distribution and level of fistulae are summarized in **Table 1**.

In center A, the first dilatation/calibration was performed under GA at a median time of 2 weeks from the definitive surgery. Following this, a protocol of RPD was initiated at a frequency starting at 1 to 2 a day. The dilatations were continued for a median duration of 112 days (interquartile range [IQR] 83–148 days).

In center B, the first postoperative anal calibration was performed under GA for 42 patients (78%). Of these, 35 dilatations were performed at the same time as stoma closure at a median time of 9 weeks after the definitive procedure. Eleven children had a dilatation of the neo-anus under GA before stoma closure because the opening was clinically assessed to be narrow. Following this, center B reserved further dilatations for specific indications including difficulty in opening bowels despite laxative therapy and narrow anal opening on inspection.

RPD were performed in four (8%) patients in center B. Three of them were male (two recto urethral fistula and one no fistula). They were noted to have anal stricture at outpatient clinic visit before stoma closure (4 weeks, 4 weeks, and 12 weeks) and were commenced on regular dilatations. The single female patient had a complex background with ARM (recto-vaginal fistula), sacral, and spinal anomalies and also had an episode of necrotizing enterocolitis, requiring formation of ileostomy (after sigmoid colostomy). Following this, the infant had PSARP at 4 months. Examination under anesthesia (EUA) and anal dilatation was performed 8 months following PSARP after which she was commenced on twice weekly dilatations onward visits performed by the medical team. However, repeat EUA showed a persistent deep perineal fissure, and defunctioning colostomy was formed to enable perineal healing. The patient was now awaiting redo PSARP.

Additional anal dilatations under GA were performed in 19 (39%) children on RPD in center A. In center B, 11 patients had a dilatation before stoma closure. In addition, six children in the non-RPD group had further GA dilatations. These children had a median of two GA dilatations (range 1–6). In addition, two among the six started on RPD also had further GA dilatations. There was no statistically significant difference in the rates of further GA dilatation between the two protocols (Fisher's exact test  $p = 0.679$ , **Fig. 1**).

Further surgical procedures were performed in 10 (22%) patients in center A. These included 6 anoplasties (one with

**Table 1** Demographic distribution of included patients in the two centers

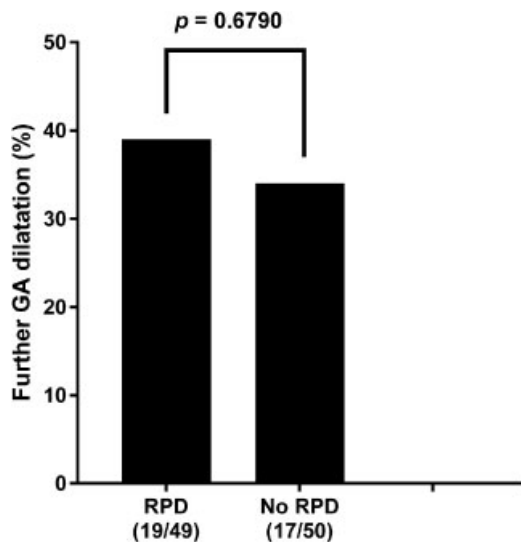
Demographic	Center A (n = 49)	Center B (n = 54)
Associated anomalies	25	38
Defunctioning stoma	45	47
Median age at definitive surgery	4 months (IQR 3–6 months)	5.8 months (IQR 4.6–9 months)
Median follow up (IQR)	37 months (IQR 17.5–48 months)	30 months (IQR 18–48 months)
Males	34	35
Rectourethral fistula	10	20
Bladder neck/prostatic fistula	4	4
Perineal fistula	5	5
No fistula	14	6
Females	15	19
Rectovestibular fistula	3	10
Rectovaginal fistula	3	4
Perineal fistula	7	3
No fistula	2	1
Rectal stenosis	0	1

Abbreviation: IQR, interquartile range.

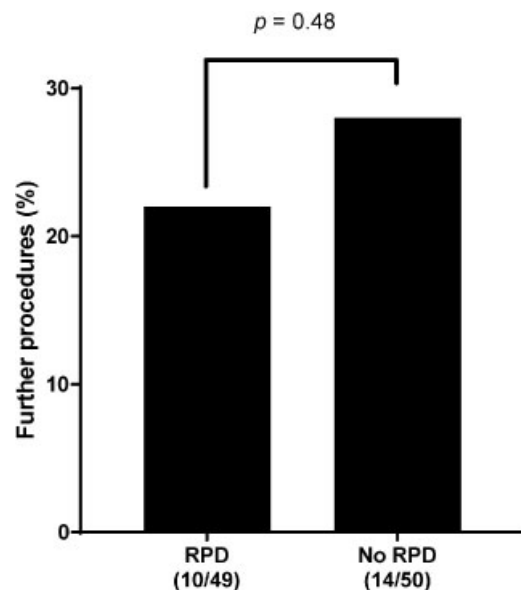
covering stoma), 1 PSARP, 2 mucosal prolapse trimming, and 1 manual evacuation. Center B performed 14 (28%) further procedures, 1 anoplasty, 1 PSARP (awaited), 6 mucosal prolapse trimming, 4 manual evacuation, and 1 repair of fistula in ano and 1 rectal plication. There was no statistically significant difference in the rate of redo procedures between the two centers (Fisher’s exact test,  $p = 0.48$ , [Fig. 2](#)).

**Discussion**

Surgery for ARM is primarily aimed at creating a neo-anus of adequate caliber without compromising the continence



**Fig. 1** Comparison of rates of further GA dilatations in the two groups. GA, general anesthesia; RPD, routine postoperative dilatation.



**Fig. 2** Comparison of rates of further perineal procedures in the two groups. GA, general anesthesia; RPD, routine postoperative dilatation.

mechanisms. Short-term complications following PSARP include anal stricture, rectal prolapse, and dehiscence. There is a wide variation in stricture rates reported in the literature, due to the heterogeneity of the condition, with a reported incidence between <5 and 78%.<sup>2,5,7–9</sup> Long-term anorectal function and quality of life depend on optimizing continence and managing constipation. Routine postoperative anal dilatations were recommended as a vital part of postoperative management to minimize the risk of anastomotic stricture and to keep the anoplasty supple.<sup>3,10</sup>

Recent international surveys in pediatric surgical literature confirm that most centers follow the protocol of regular dilatations following anorectal reconstruction.<sup>2,11</sup> Most surgeons who follow RPD start dilatations at a frequency of twice daily, commonly starting at 2 weeks following the PSARP, and regular dilatations are then started at home by parents. The dilatations are mostly performed for a period of 6 to 8 months.<sup>7</sup> More recently, weekly calibration by a surgeon has been shown to achieve similar functional outcomes compared with daily parental dilatations and avoiding the psychological stress on the parents.<sup>5</sup> The practice in center A is to dilate neonates up to Hegar size 14, close the stoma and, often to continue using suppositories thereafter.

RPD is not without possible disadvantages. A large multicenter study from Germany reported painful dilatations in 69% of the children who were on RPD following anorectal surgery in ARM, of which 43% were documented as severe pain.<sup>7</sup> There were no significant differences in the incidence of painful dilatations by age or gender. In addition to pain being a major concern for the parent/caregiver, it can also affect stooling behavior of the infant and might encourage withholding. The same study also reported bleeding in 32% of children during anal dilatations. RPD can also potentially cause damage to the anastomosis.<sup>5</sup> Psychological studies have correlated duration of anal dilatations to mental health and psychosocial functioning and suggested that anal dilatations cause significant stress for patients and parents.<sup>6,12</sup> Diseth noted that 57% of parents felt bad about inflicting intrusive procedures on their child regularly, and 36% recalled 'power struggles' during the procedure and stated that this had a negative influence on the parent-child relationship.<sup>12</sup> Parents and medical practitioners are also potentially perceived by the young child as perpetrators rather than protectors when they have had multiple invasive procedures.<sup>12</sup>

Menon and Rao described their experience of PSARP without post-operative anal dilatations in 72 females with vestibular fistula and demonstrated good short-term outcomes with no anal strictures.<sup>4</sup> Jenetzky et al also reported comparable stricture rates following definitive surgery for ARM regardless of use of RPD.<sup>7</sup> Our study has assessed outcomes following RPD or otherwise in two major United Kingdom pediatric surgical centers. We observed no significant differences in need for further procedures on the neanus between the two protocols suggesting that RPD is unlikely to be a significant factor in deciding the outcomes

of the anorectal reconstruction. Given that strictures are likely to present mostly in the first year following surgery, we expect to have captured this information with our median follow-up period of 31 months. One drawback of our study is that the follow-up period has not been enough to assess for difference continence outcomes in the two groups.

Our data suggest that there is no advantage in using RPD following PSARP for ARM. We recommend that pediatric surgeons consider limiting the use of anal dilatations as a treatment rather than as prophylactic procedures.

#### Conflict of Interest

None.

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