

Anorectoplasty in children in Papua New Guinea

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SUMMARY

The posterior sagittal anorectoplasty (PSARP) procedure for the definitive repair of children with imperforate anus was described in 1982. Unfortunately, surgeons in Papua New Guinea (PNG) have until recently not had the opportunity of being trained in the technique. Through the Medical Officer, Nursing and Allied Health Sciences Training Project (MONAHP) and Pacific Islands Project (PIP) of the Royal Australasian College of Surgeons, 65 Papua New Guinean children with an anorectal anomaly have undergone a repair, in conjunction with training of the surgical staff and medical students. A new technique for the management of a prolapsed colostomy has been developed and a protocol for management of PSARP patients postoperatively has been formulated. Patients referred to the paediatric surgical visiting teams were diagnosed and treated according to the stage their management had reached. Patients with a low anomaly were treated by a cutback procedure, those with a colostomy and a high lesion were managed by a PSARP and those with failed previous surgery were managed with a redo anorectoplasty, often without a covering colostomy. Data were collected on the patients treated and, where possible, the patients were followed during subsequent visits. 65 patients with an anorectal anomaly were treated, of whom 6 were treated with a cutback and 43 had a primary repair of a major anomaly. 5 of these 43 involved an abdominoperineal procedure. 19 children had redo surgery, 3 of whom had a second operation by the senior author, due to failure of initial postoperative management; 1 of these was for a failure to carry out the postoperative dilatations and 2 were due to poorly controlled constipation in the early postoperative period. A protocol for the postoperative dilatations was developed using shaped candles. Major complications were uncommon, in particular infections were rare despite the relative lack of facilities. However, difficulties with outpatient follow-up resulted in problems that could have been avoided. A large number of anorectal anomalies have been successfully treated as part of the MONAHP and PIP projects with local surgeons learning the technique. A protocol for follow-up and a technique for the management of colostomy prolapse have been developed.

Introduction

Anorectal anomalies are common in Papua New Guinea (PNG) but until 1993 a systematic approach to the training for the surgical treatment of these conditions was lacking. Many patients had been left for a number of years with a colostomy or had an

abdominoperineal procedure, with an unknown proportion having an unfavourable outcome, due to a lack of subspecialty training. Alberto Pena first published his improved surgical approach in 1982, an operation that has been shown to be an excellent technique for the repair of anorectal malformations. This achieves the maximum functional results

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without endangering neuromuscular innervation of the anal sphincter (1,2). With the advent of the paediatric surgical training program, Papua New Guinean patients have tended to have their definitive surgery as part of the education associated with the Pacific Islands Project (PIP) of the Royal Australasian College of Surgeons and the Medical Officers, Nursing and Allied Health Sciences Training Project (MONAHP). Postoperatively, however, many patients still continue to have functional problems reflected by a degree of soiling and constipation, although the results appear to be superior to the previous approach of a more blinded abdominoperineal technique (3). In some cases, a poor outcome can be anticipated well before surgery by demonstrating deficient muscle structures, a flat pelvis and severe sacral hypoplasia. In other patients, however, postoperative evaluation may reveal a large, dilated rectum associated with relatively good muscles, but a poor anorectal angle and associated rectal prolapse. While in some cases a secondary PSARP procedure may clearly improve functional outcome, the indications for repeating the surgery are not well established. Despite this, in 19 PNG patients a redo procedure was undertaken and a favourable outcome, without the need for a covering colostomy, was achieved in most. Many authors have been skeptical about the role of redo PSARP, preferring to use a Malone appendix antegrade enema stoma, anterior sagittal anorectoplasty (4), or sigmoid resection (5). Experience with cases in Papua New Guinea has indicated that redo surgery, even in difficult circumstances, can produce improvement for patients with persistent cosmetic or functional abnormalities after an anorectoplasty, in keeping with the view of Pena (6) and others (7,8). Importantly, patients need to have constipation controlled postoperatively and anal stenosis should be prevented by the use of dilatations that should be performed in a routine manner using an appropriately fashioned candle. Also, if colostomy prolapse occurs before the definitive anorectal anomaly repair, excision of the colonic mucosa between the proximal and distal loops will facilitate amelioration of the colostomy with a less extensive procedure.

This paper reviews the functional results of

patients who underwent both a primary and secondary PSARP between 1993 and 1999 in PNG. We describe the technique of colostomy revision and a protocol for post-PSARP dilatations.

Material and Methods

From March 1993 to 1999, 65 patients with an anorectal anomaly were treated, 6 of whom had a low anomaly and were treated with a cutback procedure. 43 had a primary repair of a major anomaly; 5 of these involved an abdominoperineal PSARP procedure. 1 abdominoperineal PSARP operation was required because the colostomy had been established using the upper rectum as the stoma in the right upper quadrant. 11 patients had plication of a megarectum as part of their initial operation.

Patients with a cutback procedure usually had an operation in the neonatal period that involved a posterior incision that extended to the posterior end of the anal dimple followed by suturing of the created free edge of the mucosa to the skin. Dilatation was usually commenced according to the protocol (Table 1) and was the same as the regimen used for the major procedures. 2 of the patients who had a cutback for a low lesion had an unnecessary colostomy established prior to the arrival of the visiting paediatric surgical team.

19 children had a redo procedure, 3 of whom had a second operation by the senior author, which were needed because of the failure of postoperative management after their first PSARP. 1 of these was for failure to carry out the postoperative dilatations and 2 were due to poorly controlled constipation in the postoperative period. The indication for redo PSARP included stenosis, rectourethral fistula, megarectum and malposition of the anorectum in relationship to the muscle complex and levator muscle. Of the 19 patients who had redo surgery, the majority did not have a colostomy at the time of the PSARP, nor was one needed subsequently. These included 3 boys who had a rectourethral fistula repaired, but no colostomy preoperatively; 2 of these boys required the use of foreskin for a urethroplasty in association with the redo PSARP.

TABLE 1**PROTOCOL FOR ANAL DILATATION POST PSARP FOR ANORECTAL ANOMALIES****Introduction**

Dilatation after the definitive procedure for correction of an anorectal anomaly is important to prevent stenosis developing at the site of the mucocutaneous anastomosis. The operation is known as anorectoplasty, posterior sagittal anorectoplasty (PSARP) or Pena.

Regimen of Dilatation

- 1 Examination and dilatation under general anaesthesia, 2 weeks after the operation.
 - Remove residual sutures.
 - Gently** dilate to the size that fits without force.
 - Dilator should be inserted into the anus for 6-8 cm.
- 2 Fashion a candle to the size to which the dilatation occurred.
- 3 In the ward, after the procedure, teach the parents to perform the dilatation. Ensure they are not simply indenting the skin and that they understand the importance of the dilatation.
- 4 The dilatation should occur twice per day for the next 2 weeks.
- 5 If the anus is stabilizing and becoming easier to dilate the dilatation can progressively decrease in frequency, with the following program:

Once per day for 1 month	then
Once every 2nd day for 1 month	then
Twice per week for 1 month	then
Once per week for 1 month	then
Once per month for 3 months	
- 6 If there is doubt about the success of dilatation the patient should be reviewed in the clinic and in theatre if stenosis has developed.
- 7 The size to which the anus should be increased will depend on the age and size of the child. After 3 months, rectal examination with the fifth finger for a baby and with the index finger for a child over 10 years should be possible.
- 8 The colostomy can usually be closed at 3 months after the anorectoplasty, but only after an examination under anaesthetic has confirmed that the anus is not strictured.

Patients who presented with colostomy prolapse underwent a repair consisting of removal of the mucosa and muscle from between the proximal and distal end of the stoma, with closure of the deep fascia while narrowing the distal stoma and leaving an adequate orifice for the proximal limb. This technique was used in 10 patients in whom it was judged that revision of the colostomy was required to enable a subsequent satisfactory outcome from a PSARP.

Results

Follow-up of patients has been less than ideal, because of the difficulties involved in getting patients to attend the follow-up paediatric surgical clinics and the evolution of the service to this population of children. Of the original cutback patients, 1 has required a PSARP and of the 43 PSARP children operated on in the program, 3 required a redo procedure. A further 16 patients also had a

redo procedure; from the total of 19 redo-PSARP children, the follow-up was better than the overall group. Only 2 of the 19 were not seen by the visiting team at follow-up, 4 continued to be incontinent, 2 were significantly improved, while 11 had either good or excellent bowel control. These results were satisfactory despite the relatively poor adherence to the dilatation protocol and dietary management and despite the sacral and pelvic muscle anomalies present. 2 redo-PSARP patients required further surgery to improve continence, but none of the redo patients had other major complications; in particular there were no patients who developed a recurrent rectourethral fistula, nor any patient who had worsened bowel control as a result of the redo.

Complications were also uncommon in the primary repair group: 1 girl required a colostomy postoperatively for poor evacuation of faeces and 1 boy had a temporary urine leak from his perineum due to a blocked urethral catheter. Perioperative complications such as major sepsis did not occur despite patients often having a significant collection of faeces in their pelvic colon and upper rectum.

Discussion

Posterior sagittal anorectoplasty is a complex operation for a major anomaly, the results of which are satisfactory if the sacrum and muscle complex is relatively normal (1,2,7). The previously described abdominoperineal procedure was less satisfactory, particularly because of the increased injury to the urethra, as occurred in PNG patients. Redo anorectoplasty has been shown, in the PNG population, to give a good result, in what may be the largest series on such procedures published (6,7). The indications for repeat surgery include anal stenosis, megarectum, constipation or a poor cosmetic result, particularly focused on the impression of the anal and rectal tone on rectal examination. The presence of a rectourethral fistula is an absolute indication for reoperation.

This extensive experience of the PSARP procedure has assisted in the training of PNG surgeons and has provided the development of expertise that has subsequently been of benefit more widely.

Several lessons have been learned from the patients treated. The previous practice of locating the colostomy in the right upper quadrant using the transverse colon resulted in patients having a large faecal collection in the pelvis at the time of the PSARP, due to the inability to lavage the faeces from such a proximal stoma. If the rectum is inadvertently used as the segment of bowel to form the colostomy stoma the PSARP procedure is made more difficult, as the perineal mobilization of the lower rectum is not possible during the PSARP operation, particularly if the rectum has been pulled to the right upper quadrant.

The ideal colostomy is a left iliac fossa stoma using the proximal sigmoid colon, but because of the late presentation of some cases, particularly in girls with some faecal outlet, the colon can be huge and therefore it is difficult to form a colostomy that will not subsequently cause problems. In those with a small diameter colon, prevention of colostomy prolapse or retraction can be achieved by closing the fascia under the loop and making the orifice in the deep fascia tight around the distal limb of the colostomy, as it re-enters the abdomen.

Important to patients in PNG has been the avoidance of septic complications by the liberal use of an iodine-containing solution for bowel cleaning intraoperatively.

If the colostomy does prolapse, reduction of the prolapse, then excision of the mucosa and muscle between the proximal and distal orifice will facilitate closing the deep fascia tightly around the distal limb and adequately around the proximal end. This will also prevent faeces entering the distal limb. If the segment leading to the anus is stenotic, it can be best to do an abdominoperineal procedure, with formation of a more proximal colostomy. As a counterpoint to difficulties with the management of patients with a major anomaly, those patients who may possibly have a low lesion should have close examination of the perineum to exclude a cutaneous fistula, so that an unnecessary colostomy can be avoided.

Conclusion

In PNG good results can be obtained for children with anorectal anomalies. The

experience described here has highlighted the need for:

- Careful exclusion of a low lesion.
- A colostomy technique for preventing prolapse and retraction.
- A technique for dealing with colostomy prolapse.
- A protocol for postoperative dilatations.
- Redo anorectoplasty in selected cases.

Redo surgery for failed anorectoplasty is appropriate when uncontrollable stenosis and rectal prolapse have complicated the surgery. However, incontinence and constipation are less likely to be improved by further surgery, particularly if the sacrum and muscle are deficient. From this series it would seem that the clinical finding of a megarectum and a poor anorectal angle might allow the prospect of a favourable outcome from redo surgery to be entertained.

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