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The role of a colon resection in combination with a Malone appendicostomy as part of a bowel management program for the treatment of fecal incontinence

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Abstract

Purpose: Surgical options previously described by us as part of a bowel management program for the treatment of soiling and fecal incontinence include (1) resection of a megarectosigmoid to reduce a patient's laxative requirement or (2) a Malone appendicostomy in patients who require enemas. We have found that some patients may benefit from both procedures.

Methods: We reviewed 18 fecally incontinent patients with structural or functional disorders of the anorectosigmoid (16 ARM, 1 spina bifida, and 1 SCT) who underwent both procedures.

Results: Of 18 patients, the enema regimen prior to resection had an average volume of 681 ml of saline (Range 400–1000 ml) and 60 ml (Range 48–117 ml) of additives (glycerine, castile soap and/or phosphate). Following the colon resection, the average volume of saline and additives was 335 ml (Range 130–650 ml) and 25 ml (Range 0–60 ml), respectively, a 50% reduction for both ($P < 0.01$). The time for enema administration and evacuation was reduced by 25%, and the enemas were more effective, rendering the patients clean in 18 of 18 cases (follow-up was 3 months to 21 years). 2 patients later demonstrated that they could be managed with laxatives alone.

Conclusion: In patients with poor continence potential and a megarectosigmoid, combining a colon resection with a Malone appendicostomy can make the enema more effective. In some rare cases we found the resection may allow for a better response to laxatives.

The goal of managing anatomical and functional disorders of the anorectosigmoid is to help affected individuals remain clean of stool. Fecal continence requires the ability to have voluntary bowel movements and to reliably evacuate stools when socially acceptable. Unfortunately, this ability is sometimes lacking in children born with anorectal malformations (ARM) [1,2], spinal problems [3], pelvic tumors [4] and other conditions [5]. However, despite this deficiency, patients can be kept clean of stool in virtually every case with a bowel management program consisting of a daily enema [6].

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Constipation in anorectal anomalies is a very common sequela. In its most severe form, hypomotility with dilation of the rectum and sigmoid colon (megarectosigmoid) can lead to overflow pseudoincontinence, which is particularly prevalent in good prognosis types of ARM (Table 1) [7–9]. This can be prevented by the judicious and early use of adequate doses of stimulant laxatives [7,8]. However, some patients experience unbearable side effects of laxative use before an adequate dose is achieved that will effectively empty the colon. In such cases, surgical resection of the dilated segment of colon has been demonstrated to dramatically reduce or eliminate the daily laxative requirement [10,11].

Anomalies at the other end of the spectrum carry a poor or indeterminate prognosis with regards to bowel control (Table 1) [6]. These patients are incontinent of stool because they are not capable of having voluntary bowel movements, and require bowel management with a daily enema [6]. The aim of the enema regimen is to administer a specially tailored enema to provoke a bowel movement which empties the colon, enabling the patient to remain clean for 24 h until the next enema. This regimen is preferred by the vast majority of patients over a permanent stoma [6]. Once a successful enema program has been established, these patients are ideal candidates for a Malone appendicostomy [12] whereby the same enema is administered antegrade through the umbilicus [6,13].

Patients who are successfully managed by enemas and who have an indeterminate continence potential may later be offered a laxative trial to assess whether a similar continent interval can be achieved by laxatives alone [6]. The period of time when they are clean, albeit with enemas, seems to improve their chance of success thereafter when attempting management with laxatives [6].

We have found that surgical adjuncts to a bowel management program consists of 1) resection of a megarectosigmoid in patients who have potential for bowel control but require an enormous dose of laxative to empty [7,8] or 2) a Malone procedure in patients who are unable to have voluntary bowel movements and require a daily enema [6,13]. We chose to apply our concept of segmental colon resection to reduce the laxative requirement to cases which are being treated with a daily enema to see if we could improve the mechanics of the enema process.

We hypothesized that there was a small subgroup of patients with poor potential for bowel control who could benefit from both procedures. The purpose of this review was to elucidate the rationale for performing these procedures in the same patient and study the outcomes achieved by this unique management strategy.

Table 1 Indicators of prognosis for bowel control in patients with anorectal malformations [7].

Good prognostic factors	Poor prognostic factors
Normal sacrum	Abnormal sacrum (poor sacral ratio)
No pre-sacral mass	Myelomeningocele
Good anal dimple	Tethered cord
Good buttock crease	Some types of ARM
Some types of ARM	• Rectourethral prostatic fistula
• Rectoperineal fistula	• Rectobladder neck fistula
• Rectovestibular fistula	• Cloacal exstrophy
• Rectourethral bulbar fistula	• Cloaca with > 3 cm common channel
• Cloaca with <3 cm common channel	• Complex defects
• Rectal atresia or stenosis	
• Imperforate anus without fistula	

1. Methods

With Institutional Review Board (IRB) approval we identified 18 patients who underwent both a colonic resection as well as a Malone procedure as part of their bowel management regimen. We initiated a retrospective chart review and then followed up with these patients prospectively in our clinic, by telephone or by an emailed questionnaire. The rationale for each procedure was explored as was the outcome in terms of bowel management (i.e. the enema/laxatives required before the two operations compared to the final regimen afterwards).

2. Results

More than 1000 patients have undergone bowel management since the inception of the program. The overall success rate is more than 95% [6], the majority of the failures being ascribed to poor compliance or due to the inability of the colon to form solid stool. Of these patients, a total of 18 patients underwent resection of a megarectosigmoid as well as a Malone procedure for the management of fecal incontinence. Sixteen patients had an ARM (3 underwent their initial ARM procedure under our care, 10 patients underwent their initial reconstruction elsewhere and required redo procedures by us, and 3 patients only underwent bowel management with us). There was 1 patient with a previously resected sacrococcygeal teratoma and 1 patient with spina bifida, which were felt to be the causes of their fecal incontinence.

15 of the 18 patients were started on an enema regimen prior to the resection of the dilated colon. Despite our best efforts and the maximum possible enema, none of these 15 patients were consistently clean. This was due to the failure to empty the megarectosigmoid as documented by abdominal radiograph. In the remaining 3 patients, the resection occurred at the time of the reoperation by us due to the huge dilatation of the colon, and bowel management with enemas was started post-operatively. The age range at time of sigmoid resection was 3–16 years, and those patients who did not have the