Malone technique for antegrade enema in children with neurogenic, intestinal, and urinary disorders: experience with 10 patients

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ABSTRACT

Background: Congenital anomalies such as spina bifida, imperforated anus, Hirschsprung’s disease, as well as repeat pelvic surgeries can cause fecal incontinence and constipation. Retrograde enemas via the anus are not always effective as severe constipation and fecal incontinence management.

Material and methods: We describe 10 patients (five boys and five girls) seen over a period of nine years with a medical history of partial bowel obstruction secondary to chronic constipation. The antegrade enema technique consists of localizing the cecal appendix without detaching it from the cecum, opening the tip, and moving it to the abdominal wall to form a stoma.

Results: Neurogenic bladder due to myelodysplasia was the underlying pathology. Simultaneous bladder enlargement was carried out in eight patients - in six of them with ileum, and in two of them with the sigmoid colon. A Monti stoma was made for bladder catheterization and a Malone stoma for the antegrade enemas. Malone stoma as the only surgery and without bladder enlargement was carried out in two patients. Mean

RESUMEN

Introducción: Anomalías congénitas como espina bifida, ano imperforado, enfermedad de Hirschsprung y cirugías pélvicas repetidas pueden causar incontinencia fecal y constipación. Los enemas retrógrados a través del ano no siempre son efectivos para el manejo de la constipación severa e incontinencia fecal.

Material y métodos: Describimos 10 pacientes en un periodo de nueve años con historia de suboclusión intestinal secundaria a constipación crónica. Cinco fueron mujeres y cinco hombres. La técnica para enemas anterógrados consiste en localizar el apéndice cecal sin despegarla del ciego, se abre la punta y se lleva ésta a la pared abdominal para formar un estoma.

Resultados: La patología de base en los pacientes fue la vejiga neurogénica por mielodisplasia. En ocho pacientes se realizó ampliación vesical simultánea, en seis con íleon y en dos con sigmoideas. Se elaboró un estoma de Monti para cateterismo vesical y un estoma de Malone para los enemas anterógrados. El estoma de Malone como única cirugía sin ampliación vesical se realizó en dos pacientes. La estancia hospitalaria en promedio fue de

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INTRODUCTION

Congenital abnormalities such as spina bifida, imperforated anus, Hirschsprung’s disease, and repeat pelvic surgeries can cause fecal incontinence. Treatment consists of establishing intestinal habits and softening the feces with diet, drugs, and enemas. Sphincter reinforcement has been attempted but its effectiveness is limited in fecal incontinence of neuropathic origin.

Retrograde enemas are not always effective in the management of severe constipation and fecal incontinence.

The technique of antegrade enema described by Malone in 1990 consists of the antegrade administration of enemas in order to empty the colon and prevent constipation. The principle of the procedure involves reimplanting the appendix to the cecum with the antireflux technique and taking the other end to the abdominal wall to form a catheterization stoma (Figure 1).

In this review, we describe the progression of 10 pediatric patients treated with the Malone antegrade continence enema (MACE) procedure over a 9-year period from October 2001 to December 2010.

METHODS

A descriptive study of the progression of pediatric patients in a mean six-year follow-up period after MACE surgery was carried out. We describe the complications and the degree of patient satisfaction that was established, correlating the results with the international medical literature.

Ten patients that had a past medical history of partial intestinal obstruction symptoms with severe chronic constipation that was refractory to conservative medical management, with fecal incontinence, and more than four hospitalizations per year due to fecal impaction, within the time frame of October 2001 to December 2010, were included in the study. Five patients were boys and five were girls, with a mean age of 12.6 years.

The surgical technique is an appendectomy without detaching the base of the appendix from the cecum, taking the tip to the abdomen and opening it so that it serves as an abdominal stoma (Figure 2).

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The enema technique introduces an 8 F feeding catheter through which plain water or saline solution instillation is carried out, starting with 100 mL and reaching up to a maximum of 1,000 mL through a 50 mL syringe in a period of approximately 15 minutes, with an expected evacuation within the following 30 minutes. This procedure is carried out every day, or every two or three days, according to patient response.
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RESULTS

Pediatric patients that presented with urologic and intestinal problems and whose main pathology was neurogenic bladder (Table 1) were included in the study.

The requirement was that they present with severe constipation, fewer than 3 evacuations per week, painful evacuation with straining, and hard feces or feces in balls in the majority of the evacuations. In addition to gastrointestinal surgery, the majority of the patients also required urinary tract surgery, such as bladder enlargement.

Simultaneous bladder enlargement was performed in eight of the patients, six with the ileum and two with the sigmoid colon. A Monti stoma was made from a small segment of the small intestine for bladder catheterization (Figures 3 to 5).

MACE surgery alone, with no additional procedure, was performed in only two patients.

Mean hospital stay was eight days. Complications included one Malone stoma stricture that required reintervention, and one patient stopped the antegrade enemas due to pain caused by the instillation of the liquid. All the patients, except the one who stopped the treatment, were satisfied with the results of the surgery.

DISCUSSION

The retrograde enemas reported by Shandling and Gilmour showed a high success rate. In this procedure a thick catheter is placed through the rectum, and large quantities of liquid are instilled for washing out the sigmoid rectum in patients with spina bifida. The experience with these enemas is that patients with neurogenic bladder are not able to keep the colon clean, possibly due to the immobility and laxness of the perineal muscles.1,2

Many patients with fecal incontinence have a past medical history of multiple operations, and the reduced anal sensitivity and anatomy they present with makes managing retrograde enemas difficult. MACE is indicated in these types of patients.

In 1980 Mitrofanoff described the use of the appendix reimplanted into the bladder with the antireflux technique. It rapidly gained in popularity and today, more than 30 years later, is still widely used.3

Table 1. General data of the 10 patients included in the study

<table>
<thead>
<tr>
<th>Patient</th>
<th>Sex</th>
<th>Age</th>
<th>Diagnosis</th>
<th>Result</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>10</td>
<td>Myelodysplasia</td>
<td>Good</td>
<td>90 months</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>12</td>
<td>ARM</td>
<td>Stricture</td>
<td>72 months</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>13</td>
<td>Myelodysplasia</td>
<td>Good</td>
<td>62 months</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>11</td>
<td>Myelodysplasia</td>
<td>Good</td>
<td>54 months</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>13</td>
<td>ARM</td>
<td>Good</td>
<td>42 months</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>7</td>
<td>Myelodysplasia</td>
<td>Abandoned (pain)</td>
<td>35 months</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>10</td>
<td>ARM</td>
<td>Good</td>
<td>28 months</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>12</td>
<td>Myelodysplasia</td>
<td>Good</td>
<td>17 months</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>8</td>
<td>Myelodysplasia</td>
<td>Good</td>
<td>12 months</td>
</tr>
</tbody>
</table>

ARM: anorectal malformations
The Malone technique uses the same principle, but without detaching the appendix from the cecum. The tip of the open appendix is taken to the abdomen to form a stoma in which a stent remains for one month and catheterization is begun for periodic washings. The advantage of this procedure is that it can be performed at the same time as bladder enlargement, and if a urinary stoma is required, a detubularized intestinal Monti segment is used.4

This procedure of antegrade enemas is not a very conventional surgery, but it is extremely useful in the management of severe refractory constipation.

REFERENCES