

Appendicostomy (Malone)

by

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Most patients who undergo repair of an anorectal malformation suffer from a degree of functional defecating disorder, and all suffer from at least some abnormality in their fecal continence mechanism. Approximately 25% of patients are deficient enough in these mechanisms that they are fecally incontinent, and cannot have a voluntary bowel movement. Some patients with Hirschsprung's disease suffer from fecal incontinence as do some with spinal problems such as spina bifida or myelomeningocele, or following spinal trauma.

Fecal incontinence represents a devastating problem which can prevent a person from becoming socially accepted and lead to serious psychological sequelae. These patients require an artificial way to keep them clean and in normal underwear, a regimen termed Bowel Management.

The Bowel Management Program consists of teaching the patient or his/her parents how to empty the colon once daily so as to stay completely clean for 24 hours. This is achieved by keeping the colon quiet in between enemas. The program is implemented by trial and error over a period of one week. The patient is seen each day and an x-ray film of the abdomen is taken to monitor on a daily basis the amount and location of any stool left in the colon as well as the presence of stool in the underwear. The decision as to whether the type and/or quality of the enemas should be modified, as well as changes in the diet and/or medication, can be made.

The keys to success of the Bowel Management program are dedication and sensitivity from the medical team. The basis of the program is to clean the colon and keep it quiet, and thus the

patient clean for the 24 hours after the enema that is given once a day. Sometimes manipulation of diet and medication are utilized for patients with a hypermotile colon. Most patients have a hypomotile or slow colon.

The program is an ongoing process that is responsive to the individual patient and differs for each child. It is usually successful within a week, during which family, patient, physician, and nurse undergo a process of trial and error, tailoring the program to the specific patient. More than 95% of the children who follow this program are artificially clean and dry for the whole day and can have a completely normal life. We believe that it is unacceptable to send a child with fecal incontinence to school in diapers when his classmates are already toilet trained, and that proper treatment to prevent this is perhaps more important than any surgical procedure with regard to its impact on the patient's quality of life.

The enema administered on a regular basis should result in a bowel movement followed by a period of 24 hours of complete cleanliness. If one enema is not enough to clean the colon (as demonstrated by an x-ray, or if the child keeps soiling), then the child requires a more aggressive treatment, and phosphate may be added to the saline enema. If the addition of the phosphate still results in inadequate results, then glycerin can be added, or an enema with a balloon catheter may help. The "right" saline enema is the one that can empty the child's colon and allow him to stay clean for the following 24 hours. This can be achieved only by trial and error and learning from previous attempts.

In children in whom a successful bowel management program has been implemented, the parents frequently ask if this program will be needed for life. The answer is usually "yes" for those patients born with a poor prognosis for bowel control. However, since we are dealing with a

spectrum of defects, there are patients with some degree of bowel control. These patients are subjected to the bowel management program in order not to be exposed to embarrassing accidents of uncontrolled bowel movements. However, as time goes by the child becomes more cooperative and more interested in his/her problem. It is conceivable that later in life, a child may stop using enemas and remain clean, following a specific regimen of a disciplined diet with regular meals (3 meals per day and no snacks) to provoke bowel movements at a predictable time. Every summer, the children with some potential for bowel control can try to find out how well they can control their bowel movements without the help of enemas. This is done during vacations to avoid accidents at school, during a time that they can stay home and try some of the potty training strategies.

If we conclude that the patient needs a daily enema in order to remain clean, then at the appropriate age we discuss with them an operation called an appendicostomy, or Malone procedure.

Most preschool and school-age children enjoy a good quality of life while undergoing the bowel management program. However, when they get older, many express a high degree of dissatisfaction. They feel that their parents are intruding on their privacy by giving them enemas. It is feasible but rather difficult for them to administer the enema themselves. For this specific group of children, an operation called a continent appendicostomy has been designed.

It is important to stress that the Malone procedure is just another way to administer an enema and therefore, before performing the operation, the child has to be perfectly clean with a bowel management regimen.

The operation consists of connecting the appendix to the umbilicus, and creating a valve mechanism that allows catheterization of the

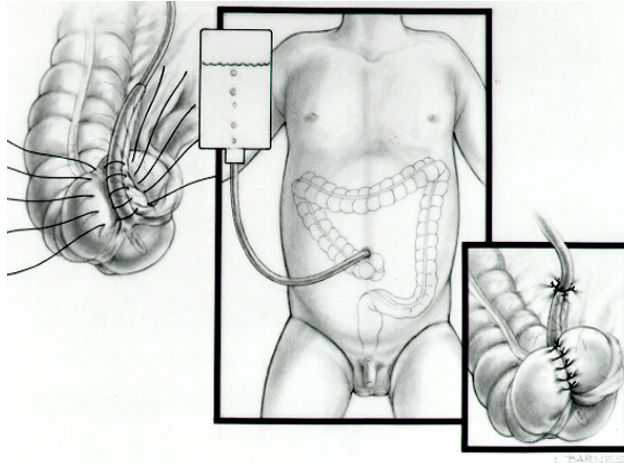
appendix for the enema fluid, but avoids leakage of stool through it. The operation involves a small incision below the belly button and sometimes can be done with the help of laparoscopy to minimize the incision. It takes approximately 2 hours to complete. We prefer the use of the appendix rather than an artificial device because it is cosmetically more hidden, and it avoids problems with the device caused by irritation of the surrounding skin.

At the conclusion of the operation a tube is left through the appendix coming out of the belly button, and is used for the enemas. At 2-3 weeks following surgery, the tube is removed and the patient and parents are taught how to pass the tube through the umbilicus once a day for the enema administration. Once the tube is out, since the orifice is hidden in the belly button, no one except for the patient, family, and doctor know it is there. The child can participate in all activities including swimming.

If the child has had his or her appendix removed, it is possible to create a new one from the colon. This is called a continent neo-appendicostomy. The appendix is made from a flap of colon which is fashioned into a tube. In such a case we do not start using the neoappendix for 4 weeks.

With an appendicostomy the enema remains the same, but the route of administration is changed. Some families note that the enema runs through more efficiently when it is administered through the Malone site, and there is a great deal of satisfaction with this procedure as it gives the child significantly more independence with their bowel management regimen.

Appendicostomy illustration: The appendix is connected to the belly button so a tube can be passed through it for the enema administration.



Appendicostomy procedure: *Top left:* Appendix and cecum *Top right:* Cecum wrapped around appendix to make a valve mechanism *Bottom:* Appendix connected to the belly button



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