The Magnetic Stoma Device:
A Continent Colostomy*

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The magnetic ring device implanted in an attempt at achieving
continence in the colonic stoma, consists of a subcutaneous ring
and a removable magnetic cap with a charcoal filter. Fourteen
patients were selected from a potential number of 58 candidates.
Fifty per cent of the patients have had good results. No compli-
cations were attributable to the implanted device. There was no
incidence of parastomal hernia. [Key words: Colostomy(ies);
Magnetic stoma device; Stoma closure, magnetic]

The aesthetic disadvantage of the colostomy is
compounded by the necessity of having to wear an
appliance, however sophisticated. Over the years,
much ingenuity has been demonstrated in attempts at
achieving continence in the stomas, but none have
succeeded in eliminating the use of an external reser-
voir pouch over the colostomy. With the natural
evacuation technique encouraged by the British sur-
geons, only 50 to 70 per cent of the patients have to
wear a colostomy bag. In this country colostomy irri-
gation is more frequently practiced. Mazier et al.
surveyed 105 patients who irrigated their colostomies;
nine patients (8.6 per cent) wore their bag at all times,
while 59 patients (55 per cent) wore a bag when going
out socially.

Feustel and Hennig, at the University of Erlangen,
Germany, first worked with a magnetic ring system in
1974. Following several modifications, they have now
performed over 180 operations with encouraging re-
results. In September 1977, Bauer et al. reported on
experimental results in animals and concluded that
low metallic toxicity resulted from the use of the
cobalt magnet implanted without its coating material.
Since then, limited studies are being carried out in a
few centers in this country. The manufacturer is to be
commended for the restraint shown in not marketing
the device prematurely.

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A magnetic ring is implanted subcutaneously in the
abdominal wall overlying the fascial aponeurosis, and
through it the sigmoid colon is brought out as a
stoma. This magnetic ring is composed of samarium
cobalt encapsulated in titanium and weighs 64 g. An
external cap contains a ring magnet in the top of the
cap and a core magnet in the center pin. The material
used for the undercoating of the cap is polyoxy-
methylene (POM), and this cap's overcoating is poly-
urethane or nylon depending on the size. The weight
of the caps ranges from 36 to 106 g while the length
of the pin ranges from 21 to 54 mm. The inter-
position of a disposable charcoal filter applied to the
undersurface of the disc allows for the egress of mal-
odorous gases (Figs. 1 and 2).

The central pin of the cap provides an average re-
taining force of five to six newtons over its working
distance. The ring device may either be implanted
primarily during the performance of the major resec-
tive procedure or secondarily in a pre-existing colonic
stoma.

Fig. 1. Magnetic ring, cap and disposable charcoal filter.
Technique

The location of the stoma is of paramount importance. The site is previously marked by the surgeon and/or the enterostomatherapist after the patient is checked in various positions. As a rule, the stoma site is higher than the conventional, and overlies the rectus abdominis muscle (Fig. 3).

It is our practice to have the enterostomatherapist penetrate the full thickness of the abdominal wall with a needle and establish a perpendicular tract with dye (methylene blue), in order to help orient later dissection. The abdominal cavity is entered through a right paramedian incision, and mobilization of the left colon and the rectum is carried out in the customary fashion.

Before dividing the bowel, the stoma site is created by excising a disc of skin about 2.5 cm in diameter with a minimal amount of underlying adipose tissue. An incision is made in the subcutaneous tissue followed by a cruciate incision in the fascia. The rectus abdominis muscle is split and the peritoneum is opened. Starting at the edge of the main incision, a pouch is created between the fascial layer and the subcutaneous tissue (Figs. 4 and 5). The ring is inserted with its center in alignment with the opening in the abdominal wall and is anchored to the fascia by placing four 3-0 Prolene® sutures (Fig. 6). The medial surface of the ring is then isolated from the later emerging bowel by several interrupted 3-0 Dexon® sutures placed between the edges of the fascia divided by the cruciate incision and Scarpa's fascia, avoiding dimpling of the overlying skin (Figs. 7 and 8). The medial edge of the fascia at the main incision is then sewn to the medial edge of the subcutaneous tissue with running 3-0 chromic catgut suture, thereby isolating the ring completely from the peritoneal cavity (Fig. 9).

The bowel is transected at the proposed site (the authors prefer the use of the GIA stapler device for this purpose), and the proximal end is covered with a condom. The colon is withdrawn through the opening in the abdominal wall and through the ring (Fig. 10).

The redundant bowel is amputated at the completion of the procedure, and the colostomy is matured using interrupted 3-0 chromic catgut sutures between the dermis and the bowel excluding the mucosa. A temporary colostomy appliance is avoided to prevent the creation of a moist chamber.

The cap is inserted four to six weeks postoperatively (Figs. 11 and 12). The patient is taught to regulate the colostomy with irrigation and gradually learns to empty the colonic contents in a disposable appliance or a kidney dish when he feels the urge.

The use of a temporary appliance overlying the magnetic cap is recommended during the early training (Table 1).

Results

During the study period of September 1977 through December 1979, 58 sigmoid colostomies...