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Anastomotic strictures in colorectal surgery: treatment with endoscopic balloon dilation

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SUMMARY: **Anastomotic strictures in colorectal surgery: treatment with endoscopic balloon dilation.**

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The incidence of anastomotic stricture following colorectal surgery has increased in recent years. This complication is observed in 2-5% of all operated patients and is probably due to the greater number of low anastomoses performed with surgical staplers.

We observed 31 patients with postoperative stricture, arising from one to nine months post-surgery. All patients had been treated for colorectal cancer and underwent endoscopy either during routine follow-up or for symptoms of stenosis. In 16 patients (group A) the stricture diameter was less than 4 mm and the patients had symptoms attributable to partial bowel obstruction. In the remaining 15 patients (group B), who had difficult bowel movements, the stricture diameter ranged from 4 to 8 mm. All patients were treated with endoscopic dilation using achalasia balloons. The results were considered good when the post-dilation anastomosis diameter achieved was at least 13 mm, fair when it was 9-12 mm and poor when it was less than 9 mm. The short term results (3 weeks) were good in 27 patients (87.2%), fair in 3 patients (9.6%), and poor in 1 patient (3.2%). After several unsuccessful dilations, the latter was treated by surgery. Follow-up at 3-4 months of the remaining 30 patients revealed good results in 20 (66.6%), fair in 6 (20%), and poor in 4 (13.3%). In 1 of these 4 patients, cancer recurrence was observed and a new surgical resection was performed. In 2 patients a self–expandable metal stent was inserted for 4-6 weeks, with satisfactory results. In 1 patient a biodegradable polydioxanone stent was inserted with good results after 6 months.

Follow-up at 3-4 months showed good results in 25 patients. After 38 months, cancer recurrence in the area of the anastomosis was observed in 1 patient, who was treated surgically.

Endoscopic dilatation should be considered the first therapeutic approach in case of anastomotic strictures, as it is immediately effective, repeatable, and does not preclude surgery if this should become necessary.

RIASSUNTO: **Le stenosi cicatriziali post-operatorie del colon: trattamento endoscopico mediante dilatazione pneumatica.**

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L'incidenza delle stenosi cicatriziali anastomotiche del colon è aumentata negli ultimi anni. La loro maggior frequenza (2-5%) è probabilmente legata al maggior numero di anastomosi basse che è possibile confezionare con l'impiego delle suturatrici meccaniche.

Abbiamo osservato 31 pazienti affetti da stenosi colorettale postoperatoria comparsa da 1 a 9 mesi dopo intervento chirurgico per neoplasia. Tutti i pazienti si sono sottoposti a esame endoscopico programmato e/o per il manifestarsi di sintomi clinici dovuti alla stenosi. In 16 pazienti (gruppo A) la stenosi era inferiore ai 4 mm e aveva determinato una sintomatologia subocclusiva; in 15 pazienti (gruppo B), che riferivano alterazioni dell'alvo, la stenosi era tra 4 -8 mm. Tutti i pazienti sono stati sottoposti a dilatazione endoscopica con pallone da acalasia. I risultati sono stati considerati "buoni" quando il calibro dell'anastomosi raggiungeva un diametro di almeno 13 mm,"discreti" quando il calibro era di 9-12 mm e "cattivi" quando il calibro era inferiore a 9 mm. I risultati a breve termine (tre settimane) sono stati considerati "buoni" in 27 pazienti (87, 2%), "discreti" in 3 (9,6%), "cattivi" in 1 (3,2%). Quest'ultimo paziente è stato indirizzato all'intervento chirurgico, dopo ripetute dilatazioni inefficaci.

Ai controlli a tre-quattro mesi nei restanti 30 pazienti il risultato era buono in 20 (66,6%), discreto in 6 (20%), cattivo in 4 (13,3%). In uno di questi ultimi si è manifestata una recidiva locale per cui si è intervenuti chirurgicamente. In due pazienti è stata posizionata una endoprotesi metallica ricoperta autoespandibile, per un periodo di circa 4-6 settimane, con buoni risultati di canalizzazione. In un altro paziente è stata utilizzata una protesi biodegradabile con buoni riusultati dopo 6 mesi.

In 25 pazienti controllati dopo 24-36 mesi si dimostravano buoni risultati. Dopo 38 mesi, in un paziente si è verificata una recidiva perianastomotica, ed è stato quindi sottoposto ad intervento chirurgico. Non si sono osservate complicanze legate alla metodica endoscopica.

La terapia endoscopica mediante dilatazione è da considerare, il primo approccio terapeutico per le stenosi cicatriziali colorettali, in quanto immediatamente efficace, ripetibile e perché, in caso di insuccesso, non esclude la possibilità di un nuovo trattamento chirurgico.

KEY WORDS: Postoperative colorectal stricture - Achalasia balloon dilation.
Stenosi postoperatorie colorettali - Dilatazione - Pallone da acalasia.

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Introduction

Postoperative stricture of colonic anastomosis is a delayed complication that seems to be related to the site and technique of the anastomosis. Its incidence is 2-5% (1-4) and it is generally associated with clinical signs and symptoms attributable to difficulty in evacuation, partial or even total intestinal obstruction.

Although this complication can be treated effectively by surgery, this is associated with significant technical difficulties, surgical risks and the possibility of recurrence (5). For this reason, endoscopic dilation has become increasingly widespread, and its good results have led it to become the first choice for the treatment of this condition.

Patients and methods

The study included 31 patients aged 50-80 with postoperative colorectal stricture. All patients had undergone surgery for cancer: 18 left hemicolectomies, 11 anterior rectal resections, and 2 resections of the sigmoid colon. The anastomosis was made manually in 8 patients and by automatic stapler in the other 23. The mean time between surgery and follow-up endoscopic examination was 3.8 months (range 1-9). A stricture with a diameter of less than 4 mm was found in 16 patients with signs and symptoms of partial obstruction (group A). The 15 patients reporting difficulties in evacuation were found to have a stricture with a diameter of 4-8 mm (group B). Endoscopic examination and biopsies, where necessary, excluded intraluminal cancer recurrence.

Patients underwent dilation with an achalasia balloon with a maximum diameter of 4 cm. The balloon was inserted through the anus on an endoscopically positioned guidewire and dilated for 1-2 minutes to a pressure of 12-20 psi once it had reached the stricture.

Follow-up was scheduled for 3 weeks and then after another 3-6 months, as indicated. In any case, patients were sent for prompt follow-up in the event of the recurrence of significant symptoms.

Results

The results were defined as good when the anastomosis diameter was at least 13 mm and patients achieved regular evacuation, fair for a diameter of 9-12 mm and the need for occasional laxatives, and poor for a diameter of less than 9 mm and constantly difficult evacuation.

At the 3-week follow-up, results were good in 27 patients (87.2%), fair in 3 patients (9.6%), and poor in 1 patient (3.2%) (Table 1). The latter patient underwent three dilations 30 days apart without success, and was finally treated by surgery. For the remaining 30 patients, results at the 3-4 month follow-up were good in 20 (66.6%), fair in 6 (20%), and poor in 4 patients (13.3%) (Table 2). The latter ones underwent up to 6 further dilations over a period of about 34 weeks, without any significant improvement. In 1 of these, transrectal ultrasound examination revealed extramucosal tumor recurrence, which was later removed by surgery. A self-expandable covered metal stent was inserted by endoscopy in 2 of these patients and kept in place for 4-6 weeks. A biodegradable stent was used in the last of these patients.

TABLE 1 - SHORT-TERM RESULTS.

Result	No. patients
Good	27 (87.2%)
Fair	3 (9.6%)
Poor	1 (3.2%)

TABLE 2 - LONG-TERM RESULTS.

Result	No. patients
Good	20 (66.6%)
Fair	6 (20%)
Poor	4 (13.3%)

Results in 25 patients at follow-up at 24 and 36 months were good. After 38 months, one patient suffered a cancer recurrence treated by surgery. No technique-related complications were observed.

Discussion

The incidence of postoperative strictures of the colon has risen in recent years, probably due to an increase in the number of anastomoses that can now be created with stapling. Surgical treatment of the stricture is associated with various technical difficulties and complications and does not completely eliminate the possibility of re-stenosis (5). For this reason, endoscopic treatment with mechanical or balloon dilation should be considered the first choice for the treatment of colorectal anastomotic stricture when cancer recurrence can be excluded by biopsy and instrumental investigations.

This treatment is effective, safe and does not preclude the possibility of further surgery where unsuccessful. A success rate of 80-90% is reported in the literature, with a low mortality (1-5%), associated mainly with perforation (0.6-4%) and more rarely with bleeding or other causes (6-7).

Dilation can be achieved with Celestin or Savary rigid dilators or balloon dilators, depending on the site and diameter of the anastomosis. The rigidity of mechanical dilators enables them to be used only in the lower part of the gastrointestinal tract, but their progressively increasing diameter can sometimes be useful in creating an initial pathway when inserted on a guidewire through very tight strictures (7-8). They are thus used above all

in low, tight strictures. Their use is also limited by both their smaller diameter (18-20 mm) and the progressive caudocranial thrust by which they achieve dilation, thus stretching the anastomosis and risking perforation.

Balloon dilation is thus currently the most frequently used technique, with Through The Scope (TTS) balloons or, preferably, achalasia balloons. The achalasia balloon can reach a diameter of 3-4 cm and can be useful in patients who did not respond to previous treatment with smaller dilators (9, 10).

The main benefits of balloon dilators over mechanical ones are that they enable the dilation of strictures in sites that are hard to access with mechanical dilators, enable a larger intraluminal diameter to be achieved, and are associated with a reduced risk of perforation due to their exclusively radial force. Once balloon dilators have reached their established maximum diameter excessive pressure will cause them to burst, thus avoiding any damage to the colon wall due to over-expansion.

In some cases, alternative or complementary endoscopic techniques can also be used, i.e. electroresection and laser therapy (11). Another possibility where repeated dilation has failed is temporary stenting after dilation of the stricture, thus stabilizing the reactive fibrosis, which is "molded" by the stent (12, 14). Biodegradable self-expandable stents may be particularly useful, as there is no need to remove them. However, experience is limited and it is not yet possible to express an opinion (15).

Conclusions

The high success rate, absence of complications and good tolerability make balloon dilation the best treatment for postoperative strictures of the colon, enabling patients to avoid the alternative of repeat surgery. Surgery should be considered necessary only where repeated attempts at endoscopic dilation have proved unsuccessful, and, obviously, in cases of cancer recurrence in the area around the anastomosis. Patients should be carefully selected by CT, MRI and endoscopic ultrasound to avoid the risk of failing to recognize recurrence, especially where repeated attempts at dilation have failed.

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