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Original articles

High macro rubber band ligature

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ABSTRACT

Purpose: The goal of a rubber band ligature is to promote fibrosis of the submucosa with subsequent fixation of the anal epithelium to the underlying sphincter. Following this principle, a new technique of ligature was developed based on two aspects:
1. macro banding: to have a better fibrosis and fixation by banding a bigger volume of mucosa and
2. higher ligature: to have this fixation at the origin of the hemorrhoidal cushion displacement.

Methods: 1634 patients with internal hemorrhoidal disease grade II or III were treated by the technique called high macro rubber band. There was no distinction as to age, gender or race. To perform this technique a new hemorrhoidal device was specially designed with a larger diameter and a bigger capacity for mucosal volume aspiration. It is recommended to utilize a longer and wider anoscope to obtain a better view of the anal canal, which will facilitate the injection of submucosa higher in the anal canal and the insertion of the rubber band device. The hemorrhoidal cushion must be banded higher in the anal canal (4 cm above the pectinate line). It is preferable to treat all the hemorrhoids in one single session (maximum of three areas banded).

Results: The analysis was retrospective without any comparison with conventional banding. The period of evaluation extended from one to twelve years. The analysis of the results showed perianal edema in 1.6% of the patients, immediate tenesmus in 0.8%, intense pain (need for parenteral analgesia) in 1.6 %, urinary retention in 0.1% of the patients and a symptomatic recurrence rate of 4.2%. All patients with symptomatic recurrence were treated with a new session of macro rubber banding. None of the patients developed anal or rectal sepsis. Small post-ligature bleeding was observed only in 0.8% of the patients.

Conclusions: The high macro rubber banding technique represents an alternative method for the treatment of hemorrhoidal disease grades II or III, with good results at a low cost. The analysis of the observed results showed a small incidence of minor complications, with a high index of symptomatic relief.

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Macro ligadura elástica alta

RESUMO

Objetivo: o objetivo de uma ligadura com banda de borracha é promover a fibrose da submucosa com subsequente fixação do epitélio ao esfíncter anal subjacente. Seguindo esse princípio, uma nova técnica de ligadura foi desenvolvida baseada em dois aspectos:
1. macro bandas: para obter uma melhor fibrose e fixação ao atingir um volume maior de mucosa e
2. ligadura alta: para obter essa fixação na origem do deslocamento do coxim hemorroidal.
Métodos: 1634 pacientes com doença hemorroidária interna de grau II ou III foram tratados pela técnica de macro ligadura elástica alta. Não houve distinção de idade, sexo ou etnia. Para executar essa técnica, um novo dispositivo hemorroidário foi especialmente projetado com um diâmetro maior e uma maior capacidade de aspiração de volume da mucosa. Recomenda-se utilizar um anoscópio mais longo e largo para obter uma melhor vista do canal anal, o que facilitará a injeção da submucosa a nível mais alto no canal anal e a inserção do dispositivo elástico. O coxim hemorroidal deve ser ligado a um nível mais alto no canal anal (4 cm acima da linha de pectinato). É preferível o tratamento de todas as hemorróidas em uma única sessão (máximo de três zonas submetidas à ligadura).
Resultados: a análise foi retrospectiva, sem qualquer comparação com a ligadura convencional. O período de avaliação variou de de um a doze anos. A análise dos resultados mostrou edema perianal em 1,6% dos pacientes, tenesmo imediato em 0,8%, dor intensa (necessidade de analgesia parenteral) em 1,6%, retenção urinária em 0,1 % dos pacientes e uma taxa de recorrência sintomática de 4,2%. Todos os pacientes com recorrência sintomática foram tratados com uma nova sessão de macro ligadura elástica. Nenhum dos pacientes desenvolveu septicemia anal ou retal. Uma pequena hemorragia pós-ligadura foi observada em apenas 0,8% dos pacientes.
Conclusões: a técnica de macro ligadura elástica alta representa um método alternativo para o tratamento da doença hemorroidal classe II ou III, com bons resultados a um baixo custo. A análise dos resultados observados mostrou uma pequena incidência de complicações menores, com alto índice de alívio sintomático.

Palavras-chave:
Hemorroidas
Tratamento ambulatorial
Tratamento não cirúrgico

Introduction

Hemorrhoids begin as localized cushions of submucosal vascular tissue situated in the anal canal underlying the transitional zone that joins the squamous epithelium of the anoderm to the rectal columnar epithelium.[1,6]

It is believed that the function of these hemorrhoidal cushions is to cushion the anal canal during defecation and to contribute to continence when engorged.[1,6]

Because hemorrhoidal cushions are a normal feature of the anal canal, the presence of hemorrhoidal disease requires pathologic changes that lead to symptoms.[1,6]

Symptoms referable to hemorrhoidal disease are believed to be the result of a combination of vascular congestion and downward displacement of the hemorrhoidal cushions caused by degeneration of the collagen and elastic tissue stroma of the anal canal.[1,5,7]

In early stages, obstruction of venous outflow leads to distention of the hemorrhoidal cushion. At defecation this displacement is repeated and enlarged, increasing the grade of elastic tissue degeneration. After repeated episodes the cushion slips through the anal canal and some grade of superficial erosion of the anal mucosa that covers the cushion may occur.[1,5,9]

As the disease progresses, shearing forces during defecation lead to degeneration of the supporting elastic tissue and to prolapse.[1,5,6,9]

Hemorrhoidal disease has been stratified into four grades:[1, 2,3,4,5,9,11]

1) Grade I – cushions are enlarged, congested, but do not prolapsed;
2) Grade II – cushions are enlarged, congested, prolapsed with defecation, but are reduced spontaneously;
3) Grade III – cushions are enlarged, congested, prolapsed consistently with defecation and must be reduced digitally;
4) Grade IV – cushions are permanently prolapsed and cannot be reduced.

The choice of hemorrhoid treatment should be based on the nature and severity of hemorrhoidal symptoms.[1,5,7,9,10,11]

No symptoms, no treatment.

Methods

Since the last decade the idea of intervening higher in the anal canal to impede the downward displacement of the

hemorrhoidal cushions, acting at its origin, has becoming more and more accepted.[5,8] The strategy of removing a segment of the anal canal to eliminate the zone with degeneration of the collagen and the elastic tissue stroma, suspending the lower anal canal, has shown to be effective for hemorrhoidal disease grades II or III.[5,8] Known as anopexy and performed with a mechanical device, this procedure establishes a new line of hemorrhoidal disease treatment.[5,8]

Based on the same principle, a new technique of rubber band ligature was developed, fixed on two aspects:[5,8,12,13]

1. To promote a better fibrosis of the submucosa and subsequent better fixation of the anal epithelium to the underlying sphincter by banding a bigger volume of tissue.[7,10,11,12,13]

2. To perform this fixation at the origin of the hemorrhoidal cushion displacement, preventing the cushion to slip through the anal canal.[5,8,10,11,12,13]

Indications

High macro rubber banding is suitable for hemorrhoidal disease grades II or III.

Contra-indications

A general examination should be performed to exclude conditions such as portal hypertension, requiring specific treatment.[1,9,11] Although anoscopy is particularly suited for the diagnosis of hemorrhoidal disease, rigid proctosigmoidoscopy or colonoscopy is frequently necessary to exclude other causes of bleeding.[1,6,11] Banding should not be performed in the presence of anal fissure (acute or chronic), abscess or fistula.

Preparation

No special preparation is necessary. A normal defecation on the day before the procedure or even on the morning of the procedure is the best preparation. Constipation should be corrected before the procedure.

Anesthesia

High macro banding is a nonsurgical therapy and, if properly performed, is painless. However, to facilitate the suction and banding, it is recommended to inject 1.5 mL of 2% lidocaine into the submucosa of the anal canal at the area previously selected, according to the location of the internal piles. This injection, with a fine needle, must be performed higher in the anal canal, 4 cm above the pectinate line and not into the hemorrhoidal cushion. This maneuver eases the suction of a big volume of tissue, fixing the hemorrhoidal cushion displacement. If the patient has more than one pile, which is more often than not, three or more areas must be injected.

Position of the patient

The Sims (left lateral) position with the pelvis raised on a sandbag is the best position for the procedure (Fig. 1).

Fig. 1 – Patient in left lateral position with the pelvis raised.

Instruments

There is only one method for performing the high macro banding: suction. The banding instrument for high macro ligature consists of a thirty-millimeter (3-centimeter) double drum in length and fifteen millimeters (1.5 centimeters) in diameter (Figs. 2 and 3). This double drum is fixed to a long shaft, at the base of which there is a trigger mechanism which can release the elastic bands as required. The small elastic rings are loaded by a conical device that enables the bands to be slipped over from the loader onto the drum. The bands are 2 millimeters in diameter when unexpanded and 1.5 cm when loaded onto the drum. The suction device is adapted to a suction pump and the hemorrhoidal cushion is drew downward by sucking the mucosa of the anal canal; with this method the surgeon can hold the anoscope with one hand and use the other one to release the bands. It is recommended to utilize a longer and wider anoscope to obtain a better view of the anal canal which will facilitate the injection of the submucosa higher in the anal canal and the insertion of the rubber band device (Fig. 4).

Procedure

The hemorrhoidal cushion must be ligated higher in the anal canal (4 cm above the pectinate line). The mucosa, pre-

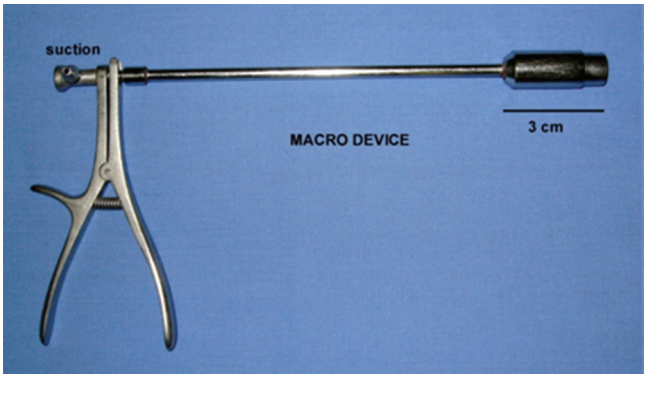

Fig. 2 – High macro rubber band instrument.

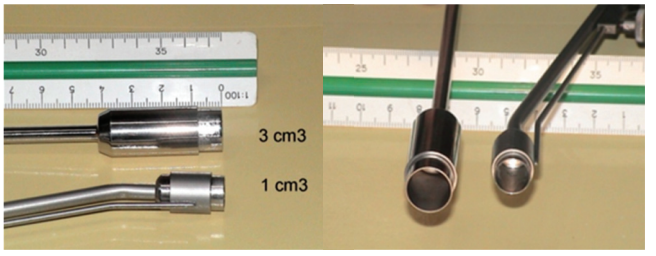

Fig. 3 – Comparison between the normal rubber-band instrument and the macro one.

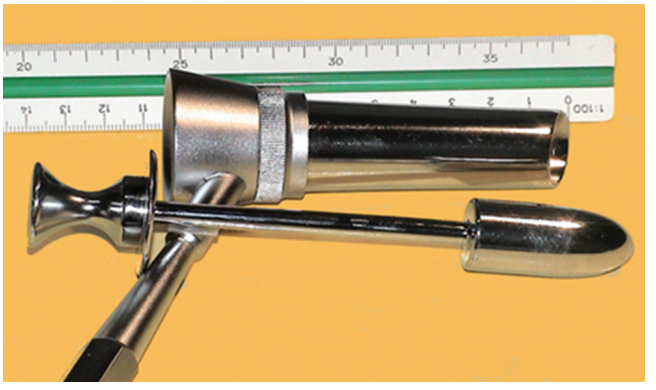

Fig. 4 – Anoscope used for high macro rubber-banding.

viously injected with 2% lidocaine, is gently suctioned at the same time when the rubber band device is slowly moved downward, parallel to the anoscope for just a small distance. This maneuver facilitates the suction of a great volume of mucosa and avoids the discomfort originated from the suction (Figs. 5 and 6). It is preferable to treat all the hemorrhoids in one single session (maximum of three). When using the macro rubber band, it is preferable to band all the existent hemorrhoids at different levels to avoid stricture of the anal canal. One ligature is placed on the right anterior

Fig. 5 – Site for banding in the high macro rubber band procedure.

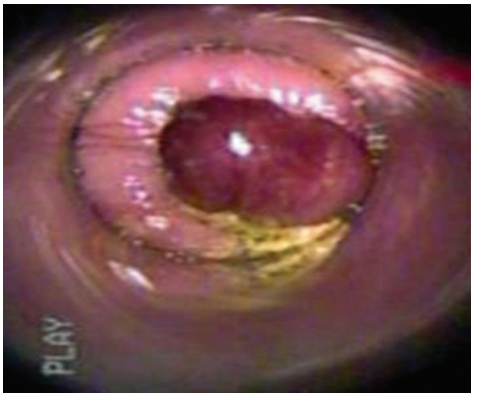

Fig. 6 – High macro rubber banding.

zone four centimeters above the pectinate line, the next one on the right posterior zone five centimeters above the pectinate line and the last one on the left lateral zone three or six centimeters above the pectinate line (depending of the volume of hemorrhoidal cushion that has to be treated). The bigger the volume of the mucosa suctioned and treated, the better will be the fibrosis and the fixation of the hemorrhoidal cushion (Fig. 7).

Sequential single banding, if necessary, can be performed but at least 30 days should elapse between the sessions.

Some important technical points

1) Spray lidocaine in the anal area and perform a gentle anal canal dilatation with lidocaine gel before the introduction of the anoscope; this maneuver tends to diminish the discomfort of the anoscope penetration.
2) Begin the procedure by injecting 1.5 mL to 2.0 mL of 2% lidocaine with a fine needle (use the dental surgeon syringe) at the area previously selected, according to the location of the internal piles, 4 cm above the pectinate line, utilizing a normal anoscope.
3) Avoid putting the macro bands very close one from the other and at the same level when banding all the piles in one single session because this can produce anal canal stricture.
4) Use a gentle suction of the mucosa, not using force to traction the hemorrhoidal cushion.
5) A little enema of 10 mL of 2% lidocaine (without adrenaline) after finishing all macro bending procedures diminishes immediate aching discomfort.

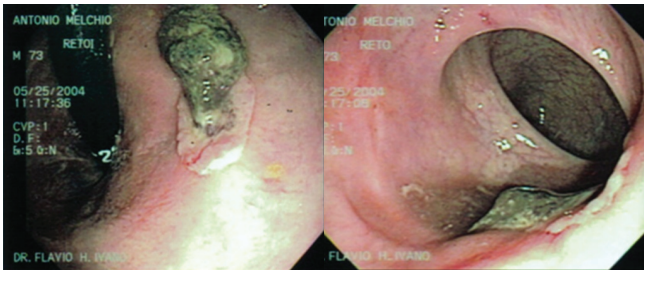

Fig. 7 – High macro rubber banding seven days after the procedure.

Results

All expressed data are derived from our personal experience.

Immediate, medium and long term results obtained in 1634 patients with hemorrhoidal disease classified as grade II or III were analyzed.

There was no distinction as to age, gender or race.

The analysis was retrospective without any comparison with conventional banding or infrared coagulation. The period of evaluation extended from one to twelve years.

Evaluation was based on previous symptoms referred by the patients, most frequently bleeding and prolapse, sometimes aching discomfort after defecation.

Follow-up protocol includes a routine of five returns: one week after the procedure, three weeks, two months, six months and one year. After the last one-year return, if the patient was asymptomatic and with a normal anoscopy, surveillance was performed by telephone, once a year. The nurse, who attended the procedure, asked for recurrence of bleeding or prolapse. All the information was noted on the patient's chart.

Only patients with a minimum of two-year follow-up were included in the study.

Of the 1634 patients treated, 1275 (78%) had three areas treated in one single session, 279 (17%) had two areas treated in one single session and 80 (4,9%) had just one zone treated in one single session.

Immediately after the procedure, some patients may present aching discomfort or tenesmus; to prevent these symptoms it is recommended to utilize an enema of 10 mL of 2% lidocaine (without adrenaline) at the end of the procedure. On the fourth day after the procedure, these manifestations of tenesmus declined until they disappeared.

Oral anti-inflammatory drugs (ibuprofeno or similar) were prescribed for 4 days to all patients .

It is interesting to inform the patient that some light bleeding defecation can occur in the first week. A clinical evaluation is necessary in cases in which the intensity of bleeding persists after 7 or more days.

In this series no skin tag was resected with the banding, but the presence of anal skin tags does not contraindicates the macro rubber banding; if necessary they can be removed with local assisted anesthesia at the same time as the macro is performed or this skin tag resection can be performed in another session to avoid post-banding pain.

The analysis of the immediate results showed perianal edema in 27 patients (1.6%), intense post-banding pain (need for parenteral analgesia) in 27 (1.6%), immediate tenesmus in 14 patients (0.8%) and urinary retention in two male patients (0.1%). Patients with anal edema had a painful post-banding period.

Light bleeding on defecation was observed in 14 patients (0.8%) in the first post-banding week. More persistent bleeding was observed in three patients (0.18%) during the second week after the procedure. All of them were examined under local anesthesia, with spontaneous stop of the bleeding.

On later surveillance, 195 patients (11.9%) complained of anal symptoms, including itching, aching discomfort after defecation and bleeding or prolapse, but only 69 (4.2%) \ showed recurrence of the disease on a new medical evaluation.

Symptomatic recurrence rate is 4.2% (69 patients). The majority of these patients (51–73.9%) belongs to the group that had just one zone banded. The recurrence in the group with three zones banded was 21.7% (15 patients out of 69).

All patients with symptomatic recurrence (69) were treated with a new session of macro rubber banding.

None of the patients developed anal or rectal sepsis.

None of the patients needed hospitalization for the observed complications.

Late

The great majority (95.8%) of the patients were free of symptoms two years after the high macro banding. The symptomatic recurrence rate is 4.2% (69 patients), all of them treated with new high macro rubber banding.

Advantages

It is an easy procedure, with satisfactory long term results at a low cost and morbidity, available for internal hemorrhoids with prolapse and bleeding.

Conclusions

The analysis of the observed results showed a small incidence of minor complications with a high index of symptomatic relief.

The high macro banding technique represents an alternative method for the treatment of internal hemorrhoids grades II and III with good results at a low cost.

The two main differences of the method with the conventional rubber banding described are:

1) Level of the banding – the macro rubber band ligature is performed 4 cm above the pectinate line.
2) Volume – the volume of the banding mucosa is 3 to 4 times superior to the usual banding technique.

Conflicts of interest

The authors declare no conflicts of interest.

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