

Banding Hemorrhoids Using the O'Regan Disposable Bander

a report by

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Professor Cleator founded the Mr and Mrs Woodward GI Clinic at St Paul's hospital, where he held many positions over the years including head of the GI Clinic and Head of Service A. He carried out more than 13,000 colonoscopies over this time and specialised in GI and bariatric surgery. He retired from hospital work in January 2003 and opened the Cleator Clinic at that time which currently serves many of the patients with this problem. He is a past president of the Canadian Association of Gastro-enterology, past president of the Vancouver Medical Association and was a board member of the BCMA for ten years. He has published more than 100 papers, chapters or articles. He has also published papers and given lectures on Time.

His academic interests include early detection of colo-rectal cancer.

Professor Cleator trained in Edinburgh in general surgery and graduated in 1962, taking up a position as an academic surgeon at UBC in 1972.

What are Hemorrhoids?

There are three cushions of tissue at the lower end of the rectum just above the dentate line and about 3cm from the anal verge. They are in the left lateral, right posterior and right anterior positions, and consist of vascular complexes intermingled with muscle fibers from the internal sphincter. Normally, these slip out a little at defecation and retract after providing a cushion or protection for the deeper layers of the anus, and help maintain continence. These can probably discriminate between solid, liquid, and gas in the lower rectum and are likely important in permitting the passage of flatus without soiling. In some people, these cushions prolapse more and more, the attachment to the internal sphincter becomes poor, and internal hemorrhoids are formed. There are a lot of possible causes for this, but the concept that has found the greatest favor is that described by Burkitt¹ – low intake of soluble fiber and water. Internal hemorrhoids are in four degrees. In the first degree the hemorrhoids bleed, second degree they bleed and prolapse but reduce spontaneously, third-degree hemorrhoids bleed and prolapse and have to be replaced manually, and fourth-degree bleed and incarcerate but cannot be reduced. Pain is not usually found in internal hemorrhoids unless they are fourth degree.¹

Many patients with internal hemorrhoids form engorged external hemorrhoidal veins under the skin around the anus as time progresses, and this causes the skin to stretch and skin tags are formed that interfere with hygiene and are uncomfortable. Many patients with internal hemorrhoids also have an anal fissure, usually posteriorly, which can co-exist with the hemorrhoids and in time causes spasm of the internal sphincter resulting in further tearing and ulceration and a lot of pain.

The Device

This is a plastic plunger suction device resembling a syringe, which is applied to each hemorrhoid in turn, 1cm above the dentate line, suction induced to cause the bulk of the hemorrhoid cushion to enter the nozzle, and then release the band to strangulate the hemorrhoid. Only one band is used to facilitate later adjustment. This can be performed under direct visualization with a

specially designed proctoscope (see Figure 1), or using a 'blind' technique where the device is inserted to a mark through the anus and directed to one of the hemorrhoid cushions, which is then banded (see Figure 2).

At the conclusion of this part of the procedure, a gloved finger is introduced into the anus and the band moved with the finger if too much tissue has been grasped, or rolled upwards if it is too low (see Figure 3). The band can rarely be removed completely by rolling it off with the examining finger. In almost all cases, the band is rolled a little to adjust it and make sure that only mucosa, and not the muscle coat, is captured by the band. This is judged by feeling a sliding of the banded mucosa over the deeper muscle. If there is significant discomfort the band is always rolled upwards or (rarely) re-applied after rolling off the first band. Usually, only one band is applied at each visit, and the patient is told there will be a feeling of fullness for a day or so but no pain.

The Patients

This is a prospective study of the treatment of hemorrhoids in all patients presenting to the clinic by referral from their family doctor or specialist between November 2002 and December 2004. All of the patients had a history and exam including rigid disposable sigmoidoscope and digital rectal examination. At the end of their treatment course, a stool occult blood test was performed. Colonoscopy is performed by another specialist in a hospital setting on those patients with diagnosed cancer or polyps or inflammatory bowel disease on exam, or for those with signs of blood loss from higher up. Colonoscopy performed as a routine, already on a follow-up program, or for strong family history is not included in the statistics.

The Clinic Set Up

This is a purpose-built clinic specializing in hemorrhoids centrally located on Broadway in Vancouver. The clinic is 1,200 square feet with secretarial station and small waiting area, doctor's office and four examining rooms with examining table and counters, and storage and sinks in every room. All equipment is disposable - gowns, sheets,

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Figure 1: This illustrates in diagrammatic form the process of applying the band on the hemorrhoid using the Proctoscope (usual technique)

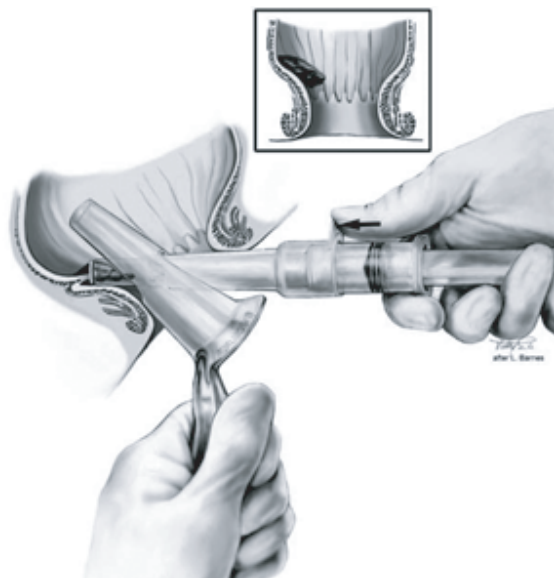
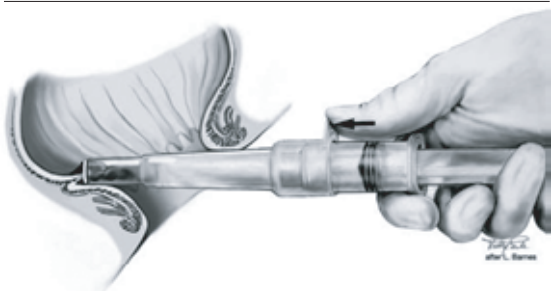


Figure 2: The 'Blind' Technique without using the Proctoscope. The Anus is Shown Dilated to Demonstrate this more Clearly.



proctoscopes, sigmoidoscopes, banders. There are telephones in every room and the computer system is fully up-to-speed (Macintosh) with links between secretary and doctor and reports going out at the end of each day on the patients. The patients come by referral. The counters and examining couches are wiped down with bactericidal wipes between patients. The times worked by the physician are five half days per week, and they are on call after hours. The office nurse is friendly and multi-lingual.

The clinic is bright and cheerful and new and has flowers at all times. The patient fills in a short history form of previous illnesses and infections, and a history is taken and exam including procto-sigmoidoscopy performed. As a rule, no more than one band is applied at a time, and the first band is applied at this visit and then weekly thereafter. If there is a concomitant fissure, Nitro-glycerin ointment is supplied. If there is pruritus, Canesten with hydrocortisone cream are supplied. If the fissure has a lot

of spasm, or there are fourth-degree hemorrhoids, banding is postponed for three weeks. Sitz baths are advised for fourth-degree hemorrhoids or severe fissures.

All patients are given written instructions in their own language on their condition and asked to take soluble fiber (two tablespoons or bran or equivalent of Metamucil or other) and seven to eight glasses of water daily. They are also told not to spend more than two minutes on the toilet for a bowel movement and nonfiber laxatives or Codeine preparations are discouraged. If they are traveling soon, they are advised to pack whole-wheat sandwiches to eat and to take two liters of water to supplement the supplies on the plane.

After the banding is completed, a stool occult blood test is performed (three windows) using the guaiacum test. If this is positive, colonoscopy is recommended. If there are other indications, colonoscopy is recommended. We plan to change the FOBT to the two-tier test soon, which incorporates a second immuno-chemical test specific for the presence of human blood. Many patients have had or are about to have colonoscopy referred already by their family doctor. We do not perform colonoscopy in the clinic and refer to other specialists who carry this out in local hospital clinics. Occasionally antibiotics are indicated prophylactically (heart valve problems) or therapeutically (very inflamed fissure).

The number of bandings per individual is variable. A few respond to one band or even diet advice alone, while others have more than three bandings. The reason for the extra bands is that some patients had such huge hemorrhoids that the band did not include the whole hemorrhoid, and other areas needed to be banded later. The total number of bandings was 5,424.

The Results

There are 1,852 patients in the study; 926 are female and 926 are male. The average age is 49.1 years. There were 5,424 bandings performed in the patients. Results are summarized in Table 1.

Figure 3: The Procedure for Rolling the Band when there is Discomfort or the Band Catches the Muscle Coat

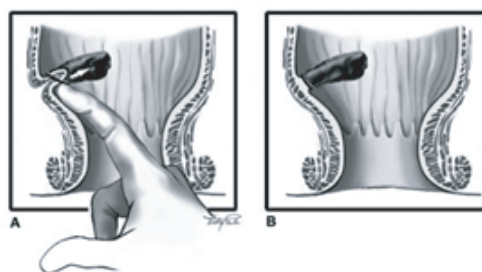


Table 1: This Gives the Important Findings in the 1,851 Patients in this Report

	Number of Patient	% of patients
<i>Total</i>	<i>1,852</i>	
<i>First-degree hemorrhoids</i>	<i>53</i>	<i>2.9</i>
<i>Second-degree hemorrhoids</i>	<i>1,527</i>	<i>82.5</i>
<i>Third-degree hemorrhoids</i>	<i>143</i>	<i>7.7</i>
<i>Fourth-degree hemorrhoids</i>	<i>129</i>	<i>7.0</i>
<i>Family history of colon cancer – first-degree relative</i>	<i>57</i>	<i>3.0</i>
<i>Past history of colo-rectal cancer</i>	<i>9</i>	<i>0.5</i>
<i>Unexplained weight loss</i>	<i>5</i>	<i>0.3</i>
<i>AIDS, hepatitis A, B, C, genital herpes, warts, combination</i>	<i>24</i>	<i>1.3</i>
<i>Bleeding disorder</i>	<i>9</i>	<i>0.5</i>
<i>Colonoscopies indicated</i>	<i>155</i>	<i>8.4</i>
<i>Colo-rectal cancer or large polyp or Ca anus found</i>	<i>47</i>	<i>2.3</i>
<i>IBD found</i>	<i>30</i>	<i>1.6</i>
<i>Incontinence</i>	<i>31</i>	<i>1.7</i>
<i>Hemorrhoids recurred</i>	<i>88</i>	<i>4.8</i>
<i>Bleeding disorder</i>	<i>9</i>	<i>0.5</i>
<i># of bandings</i>	<i>5,424</i>	<i>292</i>
<i>Overall complications</i>	<i>16</i>	<i>0.9</i>
<i>Post-band bleed</i>	<i>8</i>	<i>0.4</i>
<i>Post-band thrombosis</i>	<i>5</i>	<i>0.3</i>
<i>Post-band pain</i>	<i>3</i>	<i>0.2</i>
<i>Post-band other</i>	<i>0</i>	<i>0.0</i>

Although there were only 53 first-degree hemorrhoids, there were 13 cancers or large polyps in this group. Fifty-seven patients had a first-degree relative with colo-rectal cancer, but none had a large polyp or colo-rectal cancer. Nine had a history of previous colo-rectal cancer. Five patients had unexplained weight loss, and two of these had colorectal cancer. Twenty-four patients had a pre-existing infectious disease – HIV, hepatitis A, B, C, or genital herpes or warts, or a combination. Two of the three cases of anal cancer were in patients with HIV.

Of the patients involved, 155 had a colonoscopy generated directly from findings on rectal, proctosigmoidoscopy, or fecal occult blood test (FOBT) after treating the hemorrhoids, from bleeding seen coming from higher up, or no source found on procto-sigmoidoscopy. There are 30 patients found to have inflammatory bowel disease, mostly ulcerative colitis, but some post-irradiation colitis. Forty-seven patients had a large polyp (10), rectal cancer (26), colon cancer (eight), or anal cancer (three) found. There are still 15 patients awaiting colonoscopy, so

these figures may increase. One patient had an upper gastro-intestinal (GI) cancer found. Thirty-one patients had some degree of incontinence of stool, and all were cured or improved after banding. Eighty-eight patients developed a recurrence, treated successfully with banding. Two patients went to surgery for their hemorrhoids. The complications were as follows (see Table 1 and 2):

- Eight post-banding bleeds – these were dramatic for the patient but usually settled with telling the patient to lie down and bringing them into the office for evaluation later, finding there was no site for the bleed, or a fissure.
- Two patients were hospitalized (there was no sepsis).
- Three patients had severe pain after banding, which was treated with lidocaine-prilocaine (EMLA) cream.
- Five patients had thrombosis of a hemorrhoid after banding, which resolved with time and sitz baths.

Table 2: This Shows the Number and Percentage of Complications of the 5,422 Banding Procedures

	Number	% of 5,424 Bandings
<i>Post-band bleed</i>	<i>8</i>	<i>0.15</i>
<i>Post-band thrombosis</i>	<i>5</i>	<i>0.09</i>
<i>Post-band pain</i>	<i>3</i>	<i>0.06</i>
<i>Post-band other</i>	<i>0</i>	<i>0.00</i>

There were no other complications. There were nine patients with coagulation problems, usually because they were taking coumadin for medical conditions. Two stopped their coumadin temporarily while being banded, but all were treated by banding. There was a minor bleed in one patient, which was treated in the office with silver nitrate.

Discussion

There is general agreement in the literature that rubber banding of hemorrhoids is safe and effective^{1,3} and that surgery should be reserved for those who have large third- or fourth-degree hemorrhoids or 'mixed' hemorrhoids not responding to elastic ligation or those on anti-coagulants.

The complication rates for banding vary from series to series but the common themes of all the follow-ups are bleeding, pain, thrombosis, sepsis, urinary retention, and anal stenosis.

Late bleeding is estimated at 1% by Corman.³ Our figure of 0.15% is much less. We attribute this to two factors – less tissue trauma from the gentle suction, rather than the grasping forceps generally used, and the method of easing up the band to make sure the underlying muscle is not entrapped, resulting in low-level sepsis. Significant pain is estimated at 4% by Bartizal and Slosberg³ in their 670 patients, and Lee found 4.5% for single banding and 29% for multiple bands⁴ – our figure is 0.06%. Schwartz claims, and we believe, that severe pain is caused when the band is positioned too low on the anoderm where there is a rich supply of pain fibers.² This is easy to do with large hemorrhoids. However, this is avoided in our technique of using one band rather than two and rolling it upwards if there is pain immediately. It is our experience that if there is pain from a band, it usually comes on in three minutes, and seldom improves without changing the position of the band or removing it (rare – rolling it off). Thrombosis is estimated at 3%,³ and the figure for our patients is 0.09%. We attribute this lower figure to band positioning and emphasis on fiber and water in the diet. Urinary retention is as common as 10% to 50% after surgical hemorrhoidectomy, and 1% is the figure quoted by Schwartz as acceptable after banding, although he comments that 10% to 20% have been seen after multiple ligations.² We had none in our group and attribute this to avoiding entrapping the muscle layer with the rubber band by easing it up after applying the band and to performing single ligations. Stenosis of the anus has occurred in patients following banding, more commonly after simultaneous multiple banding.⁵ We had none in our series.

Sepsis is rare and to be feared. It is thought that inadvertent banding and later necrosis of the muscle

layer is a possible cause, and we concur with this and avoid this with our technique. We are still constantly aware of this dangerous and life-threatening condition, and on the look-out for a patient with increasing pain, fever, and difficulty with micturition. The absence of this complication so far in our series has not led to complacency.

When the histories of our patients were taken, it was evident that every modality of hemorrhoid treatment had been performed on most of the patients at one time or another prior to banding, and none was successful in the long-term. Our recurrence rate of 88 or 4.8% is less than the 12% reported by others,⁶ but we expect ours to increase with longer follow-up. It was clear, from talking to the patients who returned, that most had discontinued the advice on diet and toilet quickly after completion of their banding. This encourages the belief that a regular follow-up program, perhaps yearly, is required.

The high prevalence of colo-rectal cancer and anal cancer (six times that expected) is unexplained. An old idea is that a rectal lesion would increase the pressure in the superior hemorrhoidal veins and make them bleed. Factors related to cancer were first-degree-only hemorrhoids, absence of fissure, and unexplained weight loss. The factor related to anal cancer was HIV infection (present in two of the three cases found).

There was also a significant number of patients with inflammatory bowel disease found and treated in this group. This association is well described. The association with post-irradiation colitis is noteworthy.

Because this has been such a safe technique, nine patients had banding who had clotting disorders. Most were very poor candidates for operation because of their general health. There was only one minor bleed in this group, and that was from a fissure. Perhaps in carefully selected patients this type of banding may prove useful in the future.

A surprising finding was the cure or improvement of fecal incontinence or soiling in the 31 who had this problem. This seems a simple and non-invasive step for these patients and may well work by calibrating or narrowing the outlet. There was usually benefit after the second band.

Infection Considerations

The Medsurge ligator is disposable and can be used by one person without an assistant. The risk of transfer of infection through instruments is a constant anxiety to the surgeon. Some patients with hemorrhoids do harbor some serious infections – 24 of our patients

admitted to HIV or Hepatitis A, B, or C, or genital herpes or warts, or a combination. There are many other harmful bacteria in stool in all patients. In surgery we are using disposables in syringes, forceps, and catheters and many other items, but have not yet made the switch to a disposable ligator. Now is the time to do this and avoid the costs and inconvenience, and the risk of cleaning and sterilizing metal ligators.

Conclusion

The Medsurge ligator represents an important advance in the banding of hemorrhoids. It should be the first choice for the treatment of internal hemorrhoids because of patient acceptance and reliable results and infrequent complications.

The fact that it is a disposable avoids many of the potential problems of the older instruments.

References

1. Burkitt D P, Graham-Stewart C W, "Haemorrhoids—postulated pathogenesis and proposed prevention", *Postgraduate Medical Journal* 51(599) (1975 Sep), pp. 631–636.
2. Schwartz S I, "Principles of surgery", 6th Edition, McGraw-Hill Inc, New York, St Louis, San Francisco et al., (1994), pp.1,222–1,229.
3. Corman M L, "Colon and rectal surgery", 5th edition, Lippincott, Williams & Wilkins. Philadelphia (2005), pp.178–248.
3. Bartizal J, Slosberg J, "An alternative to hemorrhoidectomy", *Archives of Surgery* 112 (1977), pp.534–536.
4. Lee H H, Spencer R J, Jr Beart R W, "Multiple hemorrhoidal bandings in a single session, 'Diseases of the Colon & Rectum'", 37 (1) (1994 Jan), pp.37–41.
5. Lau W Y, Chow H P, Poon G P, et al., "Rubber band ligation of three primary hemorrhoids in a single session", *Diseases of the Colon & Rectum* 25 (1982), pp.336–339.
6. Steinberg D M, Liegois H, Alexander-Williams J, "Long term review of the results of rubber band ligation of haemorrhoids", *British Journal of Surgery* 62 (2) (1975 Feb), pp.144–146.