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unknown due to the lack of controlled studies. Some compounds have specific safety concerns, such as the flavonoids which can cause GI side effects or calcium dobesilate which can cause agranulocytosis.⁴³

The citrus bioflavonoids, which create pigmentation in fruits, are most often used in Europe. There are multiple alleged health benefits, but most are not substantially documented. The most common compounds include diosmin, hesperidin, rutin, naringin, tangeretin, diosmetin, narirutin, neohesperidin, nobiletin, and quercetin. A commercially available diosmin product has been shown to be effective for the treatment of hemorrhoids, but such products are not available in pharmaceutical grade in the USA.⁴⁴⁻⁴⁸ They are available as nutritional supplements (Daflon 500[®] Les Laboratoires, Servier, France) and with the increasing incidence of patients ordering international products through the internet, it is critical to be familiar with this and related supplements. Other naturally occurring compounds include "flavonoids," Rutosides,^{49,50} buckwheat herb, ruscus aculeatus (butcher's broom), hidrosmin, ginkgo biloba, saponins, escin (horse chestnut seed), and Hamamelis Virginiana (Witch Hazel).

Synthetic products include calcium dobesilate, naftazone, aminafone, chromocarbe, iquinosa, flunarizine, and sulfomucopolysaccharide. Of this group, calcium dobesilate may be the most widely examined. Its function stems from the capacity to stabilize capillary permeability, decrease platelet aggregation, and improve lymphatic transport. Metes et al.⁵¹ sought to determine the clinical efficacy of calcium dobesilate for hemorrhoids by conducting a randomized clinical trial comparing effects to fiber supplementation alone. Patient symptoms significantly improved after only 2 weeks of treatments.⁵¹

A recent meta-analysis examining the utility of flavonoids to treat hemorrhoids reviewed 14 trials.⁵² There was significant heterogeneity between trials, but there did appear to be a beneficial effect. Patients enjoyed decreased bleeding, pain, and itching. The doses and formulations of the investigated compounds were highly variable.

Office Treatments

A variety of office-based treatments are available as options for patients including RBL, infrared coagulation, bipolar diathermy, direct-current electrotherapy, injection sclerotherapy, dilation, and cryotherapy. The choice of therapies depends on surgeon experience, patient preference, availability of equipment, and medical status of the patient. It should be emphasized that all of these techniques are directed toward treatment of internal hemorrhoids. The lack of somatic innervations proximal to the dentate line permits such treatments, but excludes office-based directed treatments directed specifically toward external hemorrhoids.

Rubber Band Ligation

RBL is one of the most commonly performed office procedures to treat hemorrhoids. It has been widely adopted due to its efficacy, safety, and cost effectiveness. RBL is a technique of internal hemorrhoid fixation. A small rubber band is applied at the apex of the internal hemorrhoid, which creates an inflammatory response. The fibrotic reaction creates fixation of the hemorrhoid high in the anal canal at the normal anatomic position. By correcting the prolapse, the venous drainage improves and the hemorrhoids shrink in size.

Mechanical bowel preparation is not required, although an enema shortly before the procedure can improve visualization. Patients are ideally positioned in the prone jackknife position on a proctology table. The next best option is the left lateral decubitus position. The patient must be able to tolerate a complete anoscopic exam. If the patient cannot tolerate this examination, then this procedure may require sedation in a monitored setting. Fortunately, discomfort is quite rare.

After a formal anoscopic examination, the grasping instrument is used to bring the redundant mucosa at the proximal aspect of the internal hemorrhoids into the barrel of the banding instrument. The grasper is used to gently bring as much tissue as possible into the barrel (Figure 11-3). The band is

FIGURE 11-3. Rubber banding an internal hemorrhoid. **A** The internal hemorrhoid is teased into the barrel of the ligating gun with a McGown suction ligator or **B** a McGivney type ligator. **C** The apex of the banded hemorrhoid is well above the dentate line in order to minimize pain. (Reprinted from Beck D, Wexner S. *Fundamentals of Anorectal surgery*, 2nd ed. Copyright 1998, with permission from David Beck, MD).

duration of symptoms, or the nature of bleeding can be used to determine which patients should undergo additional evaluation. In suitable patients, it is appropriate to treat hemorrhoids first and defer formal evaluation of the colon until a later date. There is reluctance to administer a full cathartic bowel preparation in a patient experiencing significant symptoms already. It would be reasonable to defer evaluation for several weeks to months to allow treatments of the hemorrhoids. The ability of the patient to accurately characterize the blood per rectum may not be reliable enough to sufficiently differentiate benign versus malignant causes of bleeding in many cases. Therefore, the entire clinical scenario must be considered in the decision to evaluate the colon entirely for bleeding.²⁴⁻²⁸ Patients fulfilling specific criteria (such as those proposed by the Multi-Society Task Force on Colorectal Cancers) should be considered for additional workup.^{26,27}

In addition, patients with risk factors, such as being part of an HNPCC family or those with atypical bleeding, should also undergo colonoscopy.^{29,30} Hemorrhoids often present in younger patients, in whom the risk of colorectal malignancy is relatively low. This often raises the question of total colon examination. Simple hemorrhoidal bleeding does not require total colon evaluation in a young patient without other risk factors (family history); however, hemorrhoids rarely cause anemia. Thus, hemorrhoids with anemia warrant colonoscopy or contrast enema.^{31,32}

As a general rule, younger patients (<40 years old) with hemorrhoids and symptoms compatible with their disease may undergo office anoscopy and proctoscopy. If treatment immediately ceases bleeding, then no future evaluation is indicated. Patients >40 years of age with a family history or symptoms that seem out of proportion to their exam should undergo total colon evaluations.

Treatment

The treatment of symptomatic hemorrhoids is directed by the symptoms themselves. Patients should be reassured that hemorrhoids are normal components of human anatomy and that it is not necessary to remove all hemorrhoidal tissue. Treatments can be broadly categorized into three groups: (1) medical management, including dietary and behavioral therapies, (2) office-based procedures, and (3) operative therapies.

Dietary and Lifestyle Modification

Hemorrhoid symptoms are frequently related to alteration of the bowel habit. Therefore, initial therapy should be directed at modifying the stool. Constipation is most commonly related to a relative lack of dietary fiber and fluid intake. The recommendation of 25 g/day for women and

TABLE 11-3. Amount of fiber in common foods

Foods	Serving size	Total fiber (g)
Navy beans, cooked	1 Cup	19.1
Lentils, cooked	1 Cup	15.6
Pinto beans, cooked	1 Cup	15.4
Black beans, cooked	1 Cup	15.0
Artichokes, cooked	1 Cup	14.4
Lima beans, cooked	1 Cup	13.2
Garbanzo beans	1 Cup	12.5
Baked beans, cooked	1 Cup	10.4
Soybeans, boiled	1 Cup	10.3
Peas, cooked	1 Cup	8.8
Raspberries	1 Cup	8.0
Blackberries	1 Cup	7.6
Spinach, frozen, cooked	1 Cup	7.0
Lettuce, iceberg	1 Head	6.5
Pear, with skin	1 Medium	5.5
Bran flakes	3/4 Cup	5.3
Oat bran muffin	1 Medium	5.2
Broccoli, boiled	1 Cup	5.1
Apple, with skin	1 Medium	4.4
White Rice, cooked	1 Cup	4.1
Brussels sprouts, cooked	1 Cup	4.1
Oatmeal, cooked	1 Cup	4.0
Strawberries	1.25 Cup	3.8
Brown rice, cooked	1 Cup	3.5
Almonds	1 Oz	3.5
Strawberries	1 Cup	3.3
Orange	1 Medium	3.1
Banana	1 Medium	3.1
Potato, with skin, baked	1 Medium	2.9
Cucumber, peeled, raw	1 Large	2.0
Bread, whole-wheat	1 Slice	1.9
Corn, sweet	1 Ear	1.8
Carrot	1 Medium	1.7
Raisins	2 Tablespoons	1.0
Bread, wheat	1 Slice	0.9
Bread, white	1 Slice	0.6
Grapes, red or green	10 Grapes	0.5

Adapted from: United States Department of Agriculture (USDA) National Nutrient Database for Standard Reference, Release 22; www.ars.usda.gov.

38 g/day for men is rarely achieved. The United States Department of Agriculture (USDA) estimates that mean fiber intake for Americans is merely 15 g/day.³³ A high fiber diet (Table 11-3) and 64 oz of water daily should be the initial recommendations. Also, behavioral modifications such as a regular sleep/wake cycle and exercise schedule can be helpful to maintain a regular bowel habit, and therefore reduce hemorrhoid symptoms.

It can be difficult to ingest 25–35 g/day of dietary fiber, making the fiber supplement a necessary option (Table 11-4). Bulk-forming agents such as **psyllium** are generally well tolerated and cost-effective. The objective data regarding fiber supplements is somewhat conflicting, but available publications do support the use of bulk-forming agents to treat hemorrhoid symptoms. Moesgaard et al.³⁴ have

