KAWASAKI MED. J. VOL. 13 : NO. 2, 75-78 (1987)

Cryosurgical Hemorrhoidectomy: Technique and Method

Yasuhisa YAMAMOTO, Masatoshi KIMOTO, Yasuo SEO, Hideki NAGANO, Hirohide SHIMIZU, Tsutomu MURE, Sueharu IWAMOTO, Yutaka KASAI, Hiroshi NOBUTOU and Kaiso SANO

Division of Gastroenterological Surgery,
Department of Surgery,
Kawasaki Medical School, Kurashiki 701-01, Japan

Accepted for Publication on May 18, 1987

ABSTRACT. The key to gain successful results with cryosurgical hemorrhoidectomy is based on the prevention of prolapse of the edematous tissue after freezing. To prevent the edema, it is important to pull out the hemorrhoid as much as possible during freezing, to freeze only on the rectal side of the anal verge, to avoid freezing the anal verge, and to freeze the hemorrhoids in two or three separate stages when they are large such as the fourth-degree. The anal discomfort and discharge in these patients are related to prolapse of frozen tissue. Cryosurgery is an effective method of treatment for hemorrhoids if care is taken to use the proper techniques.

Key words : cryosurgery — cryosurgical hemorrhoidectomy — hemorrhoidectomy

When the diagnosis of hemorrhoids as a bleeding source is confirmed, cryosurgical treatment is preferably indicated, because this is a convenient and safe method which can be performed in the outpatient clinic (Table 1).

The purpose of this report is to describe the technique and method of cryosurgical hemorrhoidectomy in detail.

TECHNIQUE AND METHOD

As one of the preoperative preparation for the patient, it is necessary to give the outlines of the technique of cryosurgery and postoperative courses, i.e. the swelling of affected tissues after surgery causes anal prolapse occasionally and 4 to 5 weeks may be necessary for complete wound healing. This explanation is not avoidable to lessen the unnecessary anxiety of the patients in the course of treatment.

On the day of operation, no premedication is given because the drugs such as sedatives would interfere the patient from leaving the hospital soon after surgery. So the patient is only asked to evacuate the bowels before surgery.

Cryosurgical treatment is given in the outpatient clinic. The tissue freezing is performed with cryosurgical apparatus; the Cryobar made by Torisha in Japan.

山本康久，木元正利，瀬尾泰雄，長野秀樹，清水裕英，牟礼　勉，岩本末治，笠井　裕，延藤　浩，佐野開三

TABLE 1. Selection of treatment for hemorrhoidal degree

Treatment \ Degree[1)]	I	II	III	IV
Conservative	○	○		
Cryosurgery	◎	◎	◎	○
Traditional Surgery		○	◎	◎

◎ : Excellent ○ : Good

This type of equipment has large freezing capacities brought by the use of liquid nitrogen (−196°C). Cryobar is used with metal probe for application to the tissue during freezing. The freezing is sometimes done with model KR-5 made by Krymedics using liquid carbon dioxide (−79°C). Liquid nitrogen is chosen for the patients who can be admitted to the hospital for a scheduled operation. When the operation has to be performed in the outpatient clinic, liquid carbon dioxide is used preferably (Table 2).

TABLE 2. Selection of cryogen for hemorrhoidal degree

Cryogen \ Degree[1)]	I	II	III	IV
Liquid Nitrogen	◎	◎	◎	○
Liquid Carbon Dioxide	◎	◎	○	

◎ : Excellent ○ : Good

The patient is placed in a lithotomy position. The field block method with 20-30 ml of 1% xylocaine is used around the anus as anesthesia, so that the anal sphincter muscles are sufficiently relaxed to provide an adequate operative field. In the aged, whose anal canals are easy to open wide because of the relaxed sphincter muscles, local anesthesia is not necessarily used.

The hemorrhoids are visualized using the proctoscope. The practical manner of cryosurgical technique consists of placing the freezing surface of the probe against the hemorrhoid and allowing liquid nitrogen (or liquid carbon dioxide) to flow and cool the probe. The probe becomes adherent to the hemorrhoid and serves as the heat exchange surface. During freezing, the tissue becomes white and frosted in appearance. Treatment is continued until the entire hemorrhoid is frozen. Then the probe is allowed to thaw for removal.

In patient with the first- or second-degree hemorrhoids,[1)] care is taken not to enlarge the root of the hemorrhoid by widening the proctoscope too much (Table 3). It is beneficial to keep the proportion of frozen area minimal to the whole anal canal in order to prevent anal dysfunction and to permit reduction of the frozen area in the rectum after surgery. A tendency to

TABLE 3. Goligher's classification[1)]

Degree	I	II	III	IV
Prolapse	(−)	(+)	(++)	(+++)
Reducibility		Spontaneously (+)	Digitally (+)	(−)

prolapse after surgery is reduced by drawing down the hemorrhoid as much as possible and lifting it up lightly to contact the probe.

The freezing is limited to tissue above the dentate line, not reaching the anal verge and not freezing the sphincter muscle. By observing the development of the frozen tissue and moving the probe lightly over the deep tissues, the sphincter muscle is protected from direct freezing.

In postoperative period, the frozen area usually swells to about two times the original size on the first postoperative day. Though careful attention has been given to the prevention of prolapse, edema of anal verge is seen at times and it is thought to be due to insufficient draw-out of hemorrhoid at the time of operation. The main complaints after surgery are due to prolapse of the affected part and to the strangulation and swelling which may follow constriction of the anal sphincter muscle in consequence of release from field block. Relaxation of the sphincter muscle in the aged is another cause of prolapse. The most important thing in prevention of prolapse is to ensure that the affected part return completely inside the sphincter ring after freezing.

Patient's education is also repeated in the postoperative period. It is important to stress that the ordinary course after surgery is accompanied by a small amount of bleeding and more or less swelling for a few days. Patients without liver cirrhosis or renal insufficiency are followed up in the outpatient clinic, where hemorrhoidal ointment, laxatives, anti-inflammatory agents, and rectal suppositories for analgesia are prescribed.

COMMENTS

In 1984, Corman[2] described that cryosurgical hemorrhoidectomy had been widely used in the past, but its use was markedly declining in recent years. He reported in addition that cryosurgery was often accompanied by significant pain, copious anal discharge and prolonged wound healing, and that cryotherapy might lead to complications of anal sphincter damage, incontinence, and anal strictures if not performed correctly.

The quality of results from cryosurgery depends on the familiality of the surgeon with the technique and the type of cryosurgical equipment used for this procedure. We have reported the satisfactory results after cryosurgical hemorrhoidectomy with a few postoperative swelling (11.7%), however, without other complications such as sphincter muscle damage, soiling, and anal deformity.[3] Best results are achieved in patients with the first- or second-degree of hemorrhoids. In patients with the third- or fourth-degree of hemorrhoids, especially those which protrude with every bowel movement and are not sufficiently reduced, the operative results are not satisfactory. The prolapse of the edematous hemorrhoidal tissue after operation in such patient is a cause of the complaints such as anal pain, discomfort, and hypersecretion. In such patients, the limitations of the proposed frozen areas should be decided carefully before operation, taking into consideration the projected postoperative course in the prolonged healing time required for the treatment of large hemorrhoids.

In this paper, our experiences have reported several important points in achieving satisfactory results with cryosurgical hemorrhoidectomy. Careful visualization of the entire operative field is essential. In planning the operation, care must be taken not to freeze tissue below the dentate line, and the entire

frozen area must be kept within the anal canal. If the frozen tissue can be kept within the anal canal, prolapse is prevented and pain and discharge are reduced or negligible. When freezing reaches the anal verge, more complaints after surgery may be encountered.

Acknowledgment

The authors thank Dr. Andrew A. Gage, Associate Institute Director of Roswell Park Memorial Institute, Professor of Surgery, SUNY at Buffalo School of Medicine, for his helpful advices in the preparation of the manuscript.

REFERENCES

1) Goligher, J.C.: Surgery of the anus, rectum and colon, 3rd ed. London, Baillière Tindall. 1975
2) Corman, M.L.: Colon and rectal surgery. Philadelphia, J.B. Lippincott. 1984
3) Yamamoto, Y. and Sano, K.: Cryosurgical hemorrhoidectomy: how to prevent the postoperative swelling and prolapse. Cryobiology **19** : 289–291, 1982