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## A comparative study of cryosurgery versus open (milligan-morgan) hemorrhoidectomy in second and third degree hemorrhoids

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### Abstract

**Introduction:** haemorrhoidectomy is an operation for second- and third-degree haemorrhoids. There are two methods by which haemorrhoidectomy can be done open (Millan–Morgan) in which the wound is left and allowed to heal by secondary intention and cryosurgery in which freezing of hemorrhoidal tissue done.

**Aim:** to compare post-operative pain and recovery in cryosurgery and open (million-Morgan) methods and evaluate optimum choice of the procedure for second- or third-degree haemorrhoids.

**Study Design:** prospective randomised study.

**Settings:** Department of surgery, Zydus Medical College and Hospital, Dahod.

**Sample size:** 90 cases (45 cases in each group).

**Inclusion Criteria:** patients with second/third-degree haemorrhoids.

**Exclusion Criteria:** Patients with associated anal and perianal condition like fissure in ano, inflammatory bowel diseases and rectal malignancy portal hypotension were excluded from the study.

**Result:** Mean Hospital stay for open haemorrhoidectomy patients was 5 days and cryo-surgery were 2 days. Post-surgery pain was seen in 77% in open haemorrhoidectomy patients and 33% in cryo-surgery patients. Pain was relieved earlier in cryosurgery patients.

**Conclusion:** cryosurgery is the procedure of choice for second/third-degree haemorrhoids.

**Keywords:** Cryo-surgery, open (million Morgan) surgery, pain, duration time

### Introduction

Haemorrhoids is common disease. But there are many misconceptions regarding this disease. Haemorrhoids are defined differently over the period of years from simple varicosities of hemorrhoidal plexus to specialized highly vascular “cushions” of discrete masses of thick submucosa, containing blood vessels, smooth muscles, elastic and connective tissue. The term “haemorrhoid” is derived from Greek adjective meaning bleeding (Haema-blood, rhoos-flowing). The term “pile” is derived from the Latin word “pi la”, a pill or ball. When the patient complains of a swelling the disease is called as piles and when the patient complains of bleeding per rectum the disease is called as haemorrhoids. Second- and third-degree haemorrhoid formation is seen after 50 yr. of age. Many patients never have symptoms of haemorrhoids, some patients are shy to see doctor for haemorrhoids, so finding out the prevalence of this disease is difficult. There are various methods of treating haemorrhoids. Therapies for the topical treatment of haemorrhoids date back to Egyptian papyri of 170 BC. Hippocrates in 460 BC described the first surgical treatment for haemorrhoids, and suggested ‘transfixing them with a needle and tying them with a very thick and large woollen thread. There are many aetiological factors for haemorrhoids like erect posture, chronic constipation, straining during defecation, low fibre diet, heredity, high resting anal pressures. As per clinical classification for internal haemorrhoids they can be classified into four degrees. First- and second-degree haemorrhoids can be treated conservatively with dietary modifications, injection sclerotherapy, rubber band ligation, cryosurgery etc. For third- and fourth-degree haemorrhoids disease surgery is the treatment of choice is surgery. Haemorrhoids can be treated by two types of surgery open (Milligan Morgan) and cryo surgery.

In this study we are comparing open (Milligan Morgan) and cryo surgery for the post-operative pain, post-operative bleeding, post operative’s recovery, wound healing, hospital stay and evaluate procedure of choice for second/third-degree haemorrhoids.

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## Materials and Methods

This is a prospective randomized clinical study of management of second- and third-degree haemorrhoids by open (Milligan Morgan)/cryosurgery. The aim is evaluation of the post-operative pain, wound healing, post-operative bleeding, post-operative recovery, complications and follow up. This study has been done from January 2018 to January 2020. Ninety (90) patients with symptomatic and confirmed third/fourth degree haemorrhoids admitted in the surgical units at Zydus medical college and hospital were included in this study. They were allocated randomly to open or cryosurgery. All patients were detailed physical examination done and 23mm size proctoscope use for proctoscopy examination.

In our study 45 patients underwent cryosurgery. Cryosurgery is the use of freezing temperature for the therapeutic destruction of tissue began in England in 1845 when James Arnott described the use of iced salt solution (about -20C) to freeze advanced cancers in sites like breast and cervix. In 1898 Campbell white in New York introduced cryosurgery for the treatment of skin lesion using liquid air (-190C). Cryosurgery for haemorrhoids was started by Fraser and Gill and popularised by Lewis and Lloyd Williams. Cryosurgery is a technique of freezing & sudden thawing of living human tissue. The great advantage of this is that it is negligible screaming pain particularly suited for outpatient without anaesthesia, no bleeding, procedure can be repeatable, applicable on high risk patients. Equipment the fundamental principal of cryodestruction is that living cells are first injured and then killed from the effects of freezing cell death induced by combination cryobiological effects. Freezing produces local dehydration of tissues, denaturation of lipid protein complex, extra cellular ice crystal formation, membrane

alteration and enzyme inhibition. Essential item is cryoprobe which can be cooled by circulation through it of liquid nitrogen or nitrous oxide gas. Liquid nitrogen produces a reduction of temperature to -180C as compared with -70C with nitrous oxide.

Cryogen	Boiling Point (C) at ATM Pressure
liquid nitrogen	(-195.8)
Nitrous oxide(liquid)	(-89.5)
Carbon dioxide (solid)	(-78.5)
Argon liquid	(-185.7)
Freon 22	(-40.8)
Freon 12	(-29.8)

Application of cryoprobe (figure1) in cryosurgery widely used gas is nitrous oxide (figure 3) which is allowed to expand through a small orifice. The surgical effectiveness of cryoprobe (figure 2) depends upon rapid and sustained conduction of heat away from tissues, the probe tip can be autoclaved or sterilised with formalin vapour. In this method application of single probe in the long axis of pile while nitrous oxide was circulated. Immediate active portion of probe develops white frost on its surface and become adherent to part of haemorrhoid gradually margin of tissue becomes white reaching maximum width of 6-7mm after 2minutes. Freezing should be continued for 2 minutes in all. When flow of nitrous oxide stopped it takes 10-12 sec before the frost on the surface of active end of instrument thawed. The tissue ceases to be adherent to it. So, until the probe is defreeze in this way one should not attempt to withdraw the tissue pile mass becomes purplish. The thawing tissue usually takes 2-3wks to separate leaving behind the granulating area which will heal in another 2-3wks.



Fig 1: Cryo Application.



Fig 2: Cryo Probe



Fig 3: Liquid nitrogen oxide cylinder with cryo probe.

## Inclusion Criteria

All patients with symptomatic and confirmed third/fourth degree haemorrhoids.

## Exclusion Criteria

Patients with associated anal and perianal condition like fissure in ano, inflammatory bowel disease and rectal malignancy, portal hypertension. In this study 45 patients underwent open technique of haemorrhoidectomy and 45 patients underwent cryosurgery.

## Post-operative course

All the patients treated with analgesics, antibiotics and laxities. All patients allowed orally the same day. Patients observed for pain. Postoperative pain recorded by using a point visual analog scale (VAS) on which 0 represent no pain and 10 represents the

worst pain imaginable. VAS protocol was followed up after 1 week, 2 weeks, 3 weeks, 1 months, 2 months and 6 months. The duration of intervention was recorded in minutes. The data were analysed with statistical tests and presented with respective table and graphics. Patients were also observed for bleeding, discharge, urinary retention postoperatively. Patients were

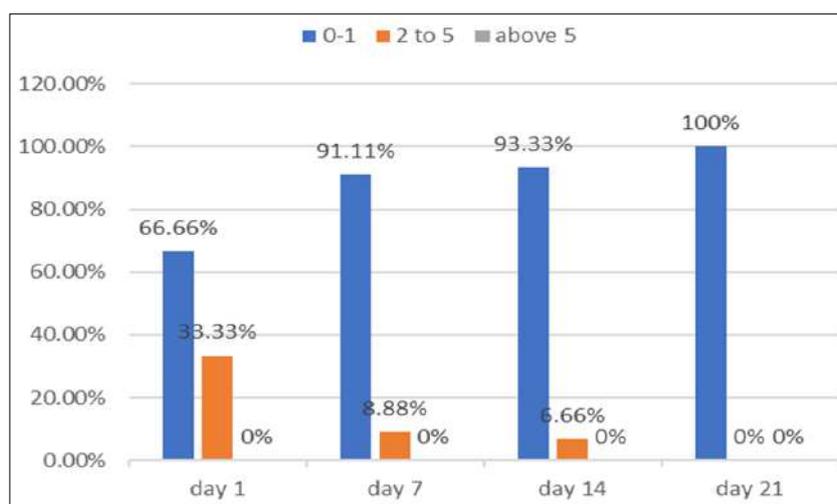
discharged depending upon their comfortness and wound condition. The average hospital stay in each technique was recorded. They were asked about complaints and examined. Digital rectal examination and proctoscopy was done on each visit.

**Table 1:** Pain VAS Scale score in cryosurgery.

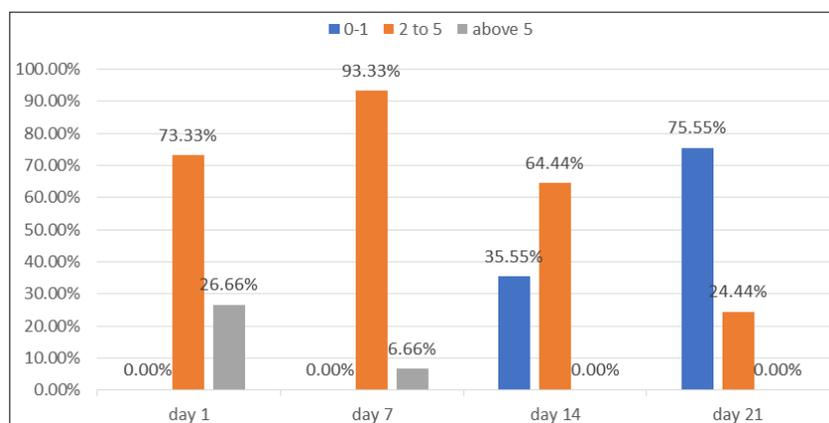
VAS Score	Day 1	Day 7	Day 14	Day 21	Month 1	Month 2	Month 6
0-1	30/45	41/45	42/45	45/45	45/45	45/45	45/45
2-5	15/45	4/45	3/45	0/45	0/45	0/45	0/45
>5	0/45	0/45	0/45	0/45	0/45	0/45	0/45

**Table 2:** Pain VAS Scale score in open haemorrhoidectomy.

VAS Score	Day 1	Day 7	Day 14	Day 21	Month 1	Month 2	Month 6
0-1	0/45	0/45	16/45	34/45	41/45	45/45	45/45
2-5	33/45	42/45	29/45	11/45	4/45	0/45	0/45
>5	12/45	3/45	0/45	0/45	0/45	0/45	0/45



**Fig 1:** Pain present by VAS score in the cryosurgery



**Fig 2:** Pain present by VAS score in the open haemorrhoidectomy

**Results**

Ninety patients were selected and randomly allocated to the

procedure, 45 in each group. The age ranges from 18 to 70 years.

Age distribution given in table 1.

	Open Haemorrhoidectomy (45)	Cryo Surgery (45)
Age	20-60	18-70
Male	36	38
Female	9	7
Male :Femal ratio	4:1	7.4:1

The most common presentation of haemorrhoids in this study was bleeding per rectum seen in 86% of cases, mass per rectum 53% and painful defecation 31%.

In open haemorrhoidectomy 35(77%) patients experience pain postoperatively which was more as compare to cryosurgery seen in 15(33%) patients that is negligible.

On follow up pain was less in patients who underwent cryosurgery. Wound healing was complete in 35 (77%) patients in cryosurgery at 3 weeks, in comparison to 15(33%) patients in open haemorrhoidectomy. On follow up at 3 months wound healing was comparable in both the surgery. The mean duration of hospital stay for patients with cryosurgery was 2 days compared to 5 days in patients with open haemorrhoidectomy. None of our patients developed delayed complications like incontinence to flatus or anal stenosis.

### Discussion

Haemorrhoids is a common disease in our society. Second- and third-degree haemorrhoids require surgery. Haemorrhoidectomy can be done by methods open (Milligan- Morgan) and cryosurgery. Most of the patients want less stay in the hospital and early return to work. Keeping this in mind, this study was conducted to compare two procedures open haemorrhoidectomy and cryosurgery and evaluate the optimum procedure for second- and third-degree haemorrhoids with regards to post-operative pain, discharge, wound healing and hospital stay. In present study, we found that a greater number of patients presented with haemorrhoids in the age group 30 to 40 years. Early presentation can be attributed to the changing dietary habits and lifestyle modifications leading to chronic constipation and straining for defecation and micturition. In our study male predominance was seen over females. Haemorrhoids are common in females, but due to their reluctant shy nature and fear for surgery most of female population do not approach for any treatment and remain undiagnosed. The results of our study are compared to study conducted by. The male: female ratio in our study was found to be higher than in study by.

The most common symptom was bleeding per rectum, which was presented in 90% patients. Mass per rectum was presented 61%. Constipation was found to be associated with 24% patients.

Most of the patients experienced pain following haemorrhoidectomy but it was more (77%) in open haemorrhoidectomy than those who underwent cryosurgery (33%). This occurs due to low ligation incorporating the sensitive anal mucosa. Another reason for post-operative pain is the presence of large raw area of anal canal wall that causes anal spasm and painful defecation. This is commonly seen after open haemorrhoidectomy. These results were comparable to study conducted by where pain following open haemorrhoidectomy was more 77% than 33% following cryosurgery. Long term pain is seen in patients undergoing open haemorrhoidectomy. This is due to excised anal canal wall leaving large raw areas.

In our study more patients (77%) had completely healed wounds following cryosurgery as compared to (33%) open haemorrhoidectomy after three weeks. There is delayed wound healing following open haemorrhoidectomy because the larger areas of anal canal walls are excised and left open. These wounds are contaminated during defecation causing the delayed healing. Furthermore, some patients may develop fistulas, abscess and later anal canal stenosis. A higher rate of wound healing was noted following cryosurgery as compared to open haemorrhoidectomy in all the studies.

Healing at 3 months in our study was comparable in both open and cryosurgery. The result of our study is also comparable with the study conducted by. The average hospital stay for patients in open haemorrhoidectomy was 5 days and cryosurgery 2 days in our present study. The shorter duration of stay in hospital, cost effectiveness and reliable outcome improves the patient's compliance. The results of hospital stay in our study were comparable with study conducted by which also suggested 5 days for open haemorrhoidectomy and 2 days for cryosurgery.

### Conclusion

There are so many other methods for management of haemorrhoid like close haemorrhoidectomy, sub mucosal haemorrhoidectomy, laser haemorrhoidectomy, stapled haemorrhoidopexy (MIPH), doppler-guided haemorrhoidectomy (DGHAL), injection sclerotherapy in all Cryosurgery is a safe and less cost-effective procedure. The complications like pain, discomfort and discharge were less. The hospital stay was less in cryosurgery as compared to open haemorrhoidectomy. Complication like anal stenosis were not seen in the follow up. Patient compliance is much better in cryosurgery and patient comes with smiley faces in follow up. Cryosurgery is the procedure of choice for second- and third-degree haemorrhoids.

**Conflict of Interest:** None declared"

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