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**Original research article**

# A Comparative Study of use of 0.2% Glyceryl Trinitrate Ointment after Haemorrhoidectomy as an Analgesic

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**Abstract**

**Introduction:** Pain is almost a constant feature after hemorrhoidectomy and is the commonest reason for delayed patient discharge [1]. 0.2% Glyceryl Trinitrate (GTN) ointment has been used to treat anal fissure and pain relief in haemorrhoids, but the value of its use post-haemorrhoidectomy as an analgesic and in wound healing is unclear. The side effect of headache has often been an associated problem. Therefore, we designed this study to evaluate the analgesic effects of local application of 0.2% GTN for pain management after hemorrhoidectomy, and its role in would healing and the unwanted incidence of headache.

**Materials & Methods:** A randomized, single blinded trial was carried out over a period of six months. 100 patients were recruited and randomized to receive either 0.2% GTN or polymyxin ointment. Patients with comorbidities that contraindicatethe use of 0.2% GTN were excluded from the study. Inferential and descriptive statistics were calculated using SPSS version 10.0

**Results:** 100 patients were recruited and divided into 2 equal groups of 50 patients each. One group received 0.2% GTN and the other 50 patients received polymyxin ointment. There was no statistically significant difference noted in gender, age and degree of haemorrhoids. Pain perception was also statistically insignificant in both the groups, however, a significant number of patients (33 out of 50) showed complete wound healing at the end of 4th week of surgery in the group receiving 0.2% GTN. This was a statistically significant finding (p=0.004). None of the patients in polymyxin group experienced headaches but this was observed in 5 patients (10%) who received 0.2% GTN, but this was statistically insignificant (p=0.317) and did not warrant the discontinuation of 0.2% GTN in the group.

**Conclusion:** 0.2% GTN ointment significantly enhances the post- operative recovery, reducing pain in terms of duration and intensity. This effect might be secondary to a faster wound healing expressed by reduced secretion, bleeding and itching time.

**Keywords**: 0.2% Glyceryl trinitrate ointment · Haemorrhoids ·Pain · Haemorrhoidectomy

## Introduction

Haemorrhoid is one of the most common diseases in both, men and women, affecting half of the world's population over the age of 50 [2]. Of the various surgical procedures, the Milligan-Morgan haemorrhoidectomy is regarded as the “gold standard” treatment for haemorrhoids [3].

Pain control after haemorrhoidectomy is constantly under debate, fearfully for the patient and challenging for the surgeon. Post-operative pain is the commonest reason for delayed patient discharge after haemorrhoidectomy. Moreover, this matter is important because of the financial burden on clinical practice and because of the ongoing search for efficiency in the health system [4]. The aetiopathology is multifactorial, depending on individual pain tolerance, type of anesthesia, post- operative analgesia, use of stool softeners, and surgical technique [5]. Several attempts have been made to reduce or alleviate the pain after haemorrhoidectomy. Non-steroidal anti- inflammatory drugs (NSAIDs) and opiates have often been used to control pain, but their use is confined to a short period time and is associated with frequent side effects [6]. A controversial belief is that post-operative pain may also be due to poor and delayed wound healing which leads to epithelial denudation. There are studies that have shown agents which improve wound healing also improve post-operative pain [7]. Post-operative pain after haemorrhoidectomy has two major causes: discomfort in sensitive wounded anoderm and internal anal sphincter spasm with subsequent hypertonia. Although the spasm of the voluntary external sphincter may also play a role in generating pain, internal sphincter spasm is thought to be the major contributor [8, 9]. During the past years, conservative and surgical solutions have been proposed to reduce this effect. Even if surgical approaches, conceptually, are more effective in reducing anal spasm, several studies failed in demonstrating pain control at 12 h after surgery (53.8 % vs 48.7 %; *p* 00.8), and at 1 week after surgery (*p* 00.05) [10]; moreover, an added risk of incontinence should be considered (as high as 5 %) [11]. Conversely, as for the treatment of anal fissures, chemical sphincterotomy has been proposed using mainly botulinum toxin injection (BTX) or glyceryl trinitrate ointment with discordant results. BTX seems to be effective in some studies, but it is expensive [12]. On the other hand, topical application of 0.2% GTN might be the valid alternative for a temporary internal sphincter paralysis as shown for the treatment of anal fissure, reducing anal resting pressure and increasing anodermal blood flow [13]. This effect, translated to post- haemorrrhoidectomy, could control pain thus facilitate wound healing and recovery time.

As a matter of fact, a recent meta-analysis indicates that this treatment appears a valid post-operative pain defender, although the authors conclude that inadequate availability of studies, is an objective limitation [7]. In this prospective randomized study, we evaluated the role of 0.2% glyceryl trinitrate ointment in reducing post-operative pain, improving wound healing and recovery after conventional haemorrhoidectomy.

## Materials & Methods

Study conducted at Department of General Surgery, ESIC Medical college, Kalaburagi (2019-2021). 100 patients with second to fourth degree haemorrhoids were recruited. They were randomly divided into two groups (50 patients each by lottery method) to receive either topical 0.2% GTN or polymyxin ointment. Confidentiality was assured and they were allowed to leave the study population at any point without stating any reason. Patients were called for 3 follow ups at the end of $2^{nd}$, $4^{th}$ and $6^{th}$ week post-operatively. Patients completed a questionnaire to assess postoperative pain for seven days after hemorrhoidectomy, and subsequently for $2^{nd}$, $4^{th}$, and $6^{th}$ week. Pain assessment was accomplished by using a visual analog scale. Patients were asked to record a point on a 10 cm line, which represented pain experienced on a daily basis. One end of the line represented "no pain" and the other "pain as bad as it could possibly be" (Figure 1).

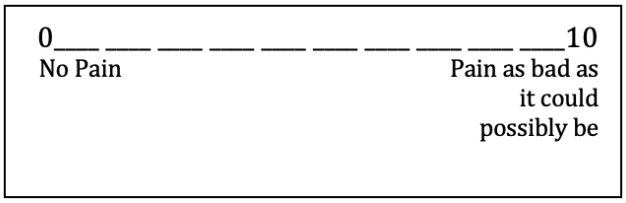


**Figure 1: Visual analog scale to measure pain perception.**

Furthermore, the wound healing was assessed as per the Table No. 1 post-operatively and carefully recorded at the end of the 2nd, 4th and 6th weeks.

Careful assessment to look for any untoward side effects due to the use of 0.2% GTN such as headache, was done. Data was recorded on a proforma designed specifically for the study. Statistical analysis was done using SPSS version 10.0. Statistically significant values were calculated using chi-square and paired t-test with the level of confidence of 95%.

| **Table : 1 Grades of Wound Healing** | |
|---|---|
| Grade | State of Wound |
| 1 | Sloughy |
| 2 | No granulation |
| 3 | Granulation |
| 4 | Epithelializing |
| 5 | Completely healed |

**Results**

A total of 100 patients, divided into two equal groups enteredthe trial. The demographic detail of each group is given in Table 2. There was a slight difference noted with both gender and age distribution. In addition, the degree of haemorrhoidsthat patients present with, was more or less same in both groups. Patients in both groups reported similar level of painon second post-operative day following removal of pack (mean, 9.50, minimum, 8, maximum 10). There was no pain difference noted in both groups at 2nd, 4th and 6th week of follow-up (p= 0.825). Patients in both groups showed equal amount of analgesic consumption.

A statistically significantdifference (p=0.004) was observed in those patients who received 0.2% GTN in post-operative period with regard to woundhealing. Out of 50 patients in this group, 33 showed complete epithelization of wound (grade 5) at 4th week (second follow-up), whereas 37 patients in the second groupshowed, grade 4 changes at second follow-up. Only 5 patients who received 0.2% topical GTN suffered from headache,which was self-limiting hence did not require discontinuationof drug (p=0.316). By the end of six weeks' follow-up, all the patients had completely healed wounds.

| Table 2. Patients Demographic and Clinical Profile | | | |
|---|---|---|---|
| | Polymyxin | 0.2% GTN | P-value |
| Females | 25 | 24 | 0.768 |
| Males | 25 | 26 | 0.767 |
| Mean Age (years) | 40.23 | 41 | 0.409 |
| Degree of hemorrhoids<br>Grade II<br>Grade III<br>Grade IV | <br>13<br>30<br>07 | <br>13<br>31<br>06 | <br><br>0.919 |

## Discussion

Topical 0.2% GTN is a time-tested drug in managing chronic analfissure for a long period. However, the initial results with itsuse in post-operative phase of haemorrhoidectomy are controversial. Hwang et al have reported most promising results in terms of pain reduction and improved wound healing [14]. In the present study we found considerable difference with regard to improved wound healing althoughthe pain perception was same in both the groups. This is similar to what has been reported by Tan et al [15].

Headacheshave been an annoying factor in patients with chronic anal fissure treated with local application of 0.2% GTN and some studies have reported up to 65% occurrence [16]. Our experience with regard to headaches is more or less the same as reported by Patti et al [17], with 5 out of 50 patients complaining of headaches. This is one of the reasons why newer drugs are being searched. However, when compared to a study by Wasvary et al, [8] where the incidence of transient headaches was 53%, only 10% of the patients in our study had headaches. But in both the studies, no patient felt the headache warranted discontinuation of the ointment.

Numerous publications investigating the benefits of NTG therapy for anal fissure were helpful in creating this study. Because there is no standard dose delivery system currently available, the amount of ointment used has been quite variable [18]. The ideal concentration of NTG to reduce anal resting pressure is unresolved, but the use of a 0.2 percent preparation is generally considered adequate [19].

Recently intra-sphincteric injection of botulinum toxin has been tried and its efficacy was compared with topical GTN.The researchers have found a single injection of botulinummore effective in terms of enhanced wound healing, pain reduction without any side effect [17].

## Conclusion

0.2% GTN ointment enhances significantly post-operative recovery, reducing pain in terms of duration and intensity. This effect might be secondary to a faster wound healing expressed by reduced secretion, bleeding and itching time.

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