

# ROLE OF TOPICAL GLYCERYL TRINITRATE AS AN ADJUNCT FOLLOWING MILLIGAN-MORGAN'S HAEMORRHOIDECTOMY

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## ABSTRACT

*Objective* To assess the efficacy of topical glyceryl trinitrate (GTN) when used in post-operative period after haemorrhoidectomy in terms of rapid wound healing in a shorter period along with pain reduction.

*Study design* Comparative trial.

*Place & Duration of study* Department of Surgery, Liaquat University Hospital Jamshoro, from February 2007 to August 2007.

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

*Results* Sixty patients were recruited. 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 (20 out of 30) showed complete wound healing at 4th week of surgery. This was a statistically significant finding ( $p=0.004$ ). None of the patients in polymyxin group experienced headaches but this was observed in three patients who received GTN.

*Conclusions* Topical GTN is an effective agent in hastening wound healing after Milligan Morgan's haemorrhoidectomy. Its role in better management of pain was, however not observed.

*Key words* Milligan-Morgan's haemorrhoidectomy, GTN, Wound healing, Pain.

## INTRODUCTION:

Surgeons have treated haemorrhoids for centuries. The first surgical treatment described in the Hippocratic treatise 460 BC, and suggested 'transfixing them with a needle and tying them with a very thick and large woolen thread.'<sup>1</sup> Milligan and Morgan wrote their classic paper on open haemorrhoidectomy,

an 'excision-ligation' procedure for haemorrhoids, in 1937.<sup>2</sup> This has been subject to numerous modifications over the years, and more recently adapted by the use of diathermy,<sup>3</sup> laser,<sup>4</sup> ligasure,<sup>5</sup> and harmonic scalpel.<sup>6</sup> The underlying principle of open haemorrhoidectomy is the preservation of skin bridges between the excised haemorrhoids to prevent stricture. It remains the same regardless of the instrument of excision used. Wounds are left to heal by secondary intention. This is associated with considerable discomfort postoperatively and the patients have to wait for a long time to resume their work. The idea of utilizing chemical

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sphincterotomy in the post-operative period of haemorrhoidectomy has fascinated many surgeons and researchers since it is free of risk of permanent decrease in resting anal pressure and incontinence.<sup>7</sup>

All the topical agents used to treat chronic anal fissure like nitrates,<sup>8</sup> calcium channel blockers,<sup>9,10</sup> botulinum toxin<sup>11</sup> and sildenafil<sup>12</sup> (each by its own mechanism of action) cause relaxation of internal anal sphincter. The anodermal blood flow is increased, thus resulting in faster wound healing and marked pain reduction. Based on this idea, topical application of glyceryl trinitrate, botulinum toxin and triambutine are now used worldwide with the hope that this will shorten healing time and decrease pain after haemorrhoidectomy.

An incomplete or delayed wound healing is associated with perianal irritation and feeling of being unwell for a long period. The primary objective of this study was to assess the efficacy of 0.2 %GTN in promoting wound healing and pain reduction following open haemorrhoidectomy. As secondary end point, the side effects associated with application of this drug were observed.

#### PATIENTS AND METHODS:

It was a single blinded, randomized study carried out in the surgical unit-IV of Liaquat University Hospital, Jamshoro, from February 2007 to August 2007. Sixty patients with second to fourth degree haemorrhoids were recruited. They were randomly divided into two groups (30 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. Exclusion criteria were presence of any comorbidities that contraindicate the use of topical GTN like ischaemic heart disease, migraine headache, postural hypotension, pregnancy or raised intra-ocular pressure. Patients with dual pathologies in anal region like fistula or fissure were also excluded. 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%.

All the patients underwent Milligan-Morgan's haemorrhoidectomy by two experienced surgeons. The wounds were left open to heal by secondary intention. Anal canal was packed with a small gauze soaked in lignocaine jelly for better haemostatic control.

The pack was removed on second post-operative day and topical application of either polymyxin or GTN started in the ward. Patients were advised to apply topical GTN using a measuring spoon, three times a day. This regimen delivered approximately 300 mgs of GTN per application. Ibuprofen 1.5 gm and /or 1 gm of diclofenac per day were prescribed for pain control. All patients were asked to take sitz bath twice a day before application of drug. They were followed

up at outpatient clinic of the department at 2nd, 4th and 6th weeks after surgery. We used similar criteria for wound classification as that of Tan et al.<sup>14</sup> This is elaborated in table 1. For monitoring of pain, verbal rating scale (VRS) was used, since it is easy and convenient to be used by illiterate population. The compliance in terms of application protocol was noted at each visit.

#### RESULTS:

A total of 60 patients, divided into two equal groups entered the 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 haemorrhoids that patients presents with, was more or less same in both groups. Patients in both groups reported similar level of pain on 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 2<sup>nd</sup>, 4<sup>th</sup> and 6<sup>th</sup> week of follow-up (p=0.825). Patients in both groups showed equal amount of analgesic consumption. A statistically significant difference (p=0.004) was observed in those patients who received GTN in post-operative period with regard to wound healing. Out of thirty patients in this group, 20 showed complete epithelialization of wound (grade 5) at 4<sup>th</sup> week (second follow-up), whereas 22 patients in the second group showed, grade 4 changes at second follow-up. Only three patients who received topical GTN suffered from headache, which was self-limiting hence did not require discontinuation of drug (p=0.317). Rest of the side effects are shown in figure 1. By the end of six weeks follow-up all the patients had completely healed wounds.

**Table : 1 Grades of Wound Healing**

Grade	State of Wound
1	Sloughy
2	No granulation
3	Granulation
4	Epithelializing
5	Completely healed

**Table 2. Patients Demographic and Clinical Profile**

	Polymyxin	GTN	P-value
Females	15	14	0.768
Mean Age (years)	40.23	41	0.409
Degree of hemorrhoids			
2 <sup>nd</sup>	08	08	0.919
3 <sup>rd</sup>	18	19	
4 <sup>th</sup>	04	03	

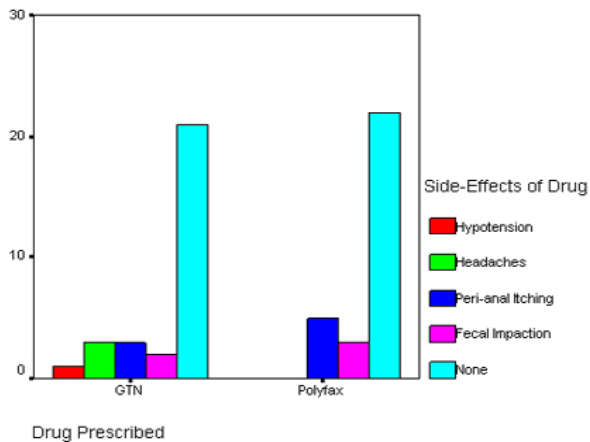


Figure 1. Side Effects

### DISCUSSION:

The better understanding of pathophysiology behind chronic anal fissure and the excellent management of this condition with topical agents that cause relaxation of internal anal sphincter, has opened new horizons for the researchers. These drugs are now being used worldwide to assess their effectiveness in managing postoperative wound healing and pain reduction following haemorrhoidectomy. Regardless of any surgical variety, haemorrhoidectomy is associated with considerable post-operative pain and discomfort. This is most significant with Milligan-Morgan's technique, as the wound is left open to heal with secondary intention. This delays an individual return to routine life, especially work for a long period. Post-operative spasm of internal anal sphincter is one of the major contributory factors behind this. To address the issue many techniques are being employed in combination with original procedure but all seems to have failed.

Topical GTN is a time-tested drug in managing chronic anal fissure for a long period. However, the initial results with its use 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.<sup>13</sup> In the present study we found considerable difference with regard to improved wound healing although the pain perception was same in both the groups. This is similar to what has been reported by Tan et al.<sup>14</sup> Headaches have been an annoying factor in managing patients with chronic anal fissure and some studies have reported up to 65% occurrence.<sup>15</sup> Our experience with regard to headaches is more or less the same as reported by Patti et al.<sup>16</sup> This is one of the reasons why newer drugs are being searched. 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 botulinum more effective in terms of enhanced wound healing, pain reduction without any side effect.<sup>17</sup>

The results of our study are based upon a relatively small

sample size. Our findings need to be validated at other centers with much larger number of patients. However, our experience with the topical application of 0.2 % GTN has proved effective adjunct to hemorrhoidectomy in terms of fastened wound healing and thereby promotes early return to daily chores. This could prove to be of significant importance to an individual and community.

### CONCLUSIONS:

GTN ointment, when applied topically after Milligan-Morgan's haemorrhoidectomy is associated with rapid wound healing, without considerable side effects. Its role as an analgesic did not prove promising.

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