

Topical Diltiazem for Pain Relief after Hemorrhoidectomy

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ABSTRACT

AIM

To assess effectiveness of 2% Topical Diltiazem ointment use for pain relief after open haemorrhoidectomy surgery.

METHODS

A randomized, prospective, randomised study was conducted on 2 groups of patients in the postoperative period of open haemorrhoidectomy. Each group consisted of 46 patients. Group A received topical diltiazem in the anal region 3 times a day and group B received a tablet tramadol.

RESULTS

In group A, the mean score on the visual analogue scale was 5.6 at 24 h, 1.5 at 48 h, and 0.5 at 72 h. In group B, it was 6 at 24 h, 3.6 at 48 h, and 2 at 72 h.

CONCLUSION

In this study average pain scores after using 2% Topical Diltiazem ointment at 48 hours was 1.5 as compared control group 3.6 and at 72 hours was 0.5 as compared control group 2.0 which is nearly comparable to above mentioned studies. Hence, there was significant reduction of haemorrhoidectomy pain at 48 hours and 72 hours in patients who applied 2% Topical Diltiazem ointment.

KEYWORDS

Open haemorrhoidectomy; Topical diltiazem; Post-operative pain

INTRODUCTION

Haemorrhoids are cushions of submucosal tissue containing venules, arterioles, and smooth muscle fibers that are located in the anal canal. There are few diseases more chronicled in human history than symptomatic

haemorrhoidal disease. References occur in ancient texts dating back to Babylonian, Egyptian, Greek, and Hebrew cultures [1,2]. Included in many of these writings are multiple recommended treatment regimens, including anal dilation, topical ointments, and the intimidating red hot poker [3,4]. Although few people have died of

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hemorrhoidal disease, many patients wish they had, particularly after therapy, and this fact led to the beatification of St. Fiachre, the patron saint of gardeners and hemorrhoidal sufferers [5]. It is important for the practitioner to give a more humane approach to hemorrhoidal disease, with the emphasis on cost-effectiveness with minimal morbidity and mortality.

Because haemorrhoids are a normal part of anorectal anatomy, treatment is only indicated if they become symptomatic. Today there are a variety of treatments available for symptomatic hemorrhoids. Patients can be treated conservatively with seitz bath, anaesthetics, corticosteroids, analgesics, soothing agents.

Office procedures for treatment include: rubber band ligation, injection therapy, cryotherapy, and photocoagulation. Surgical methods like Open Haemorrhoidectomy, Whitehead's Haemorrhoidectomy, Procedure for Prolapse Haemorrhoids/Stapled Haemorrhoidectomy [6] and Doppler-Guided Haemorrhoidal Artery Ligation [7] have evolved over the period of years.

Spasm of the internal anal sphincter is thought to be related to the source of pain after haemorrhoidectomy and may be a component of postoperative haemorrhoidectomy pain.

Diltiazem, a calcium channel blocker, has been shown to reduce resting anal pressure and relax gastrointestinal smooth muscle [8-11].

Post operatively the patient had grade II post operative pancreatic fistula managed with injection octreotide. Post operatively the patient has normal hemogram and liver function test. The histopathology was consistent with neuroendocrine tumor of pancreas.

OBJECTIVES OF THE STUDY

To assess effectiveness of 2% topical Diltiazem ointment use for pain relief after open haemorrhoidectomy surgery.

Inclusion criteria

All patients posted for Open Milligan-Morgan haemorrhoidectomy.

Exclusion criteria

- Patient already under treatment with calcium channel blocker agent
- Patient that did not give their informed consent to get involved in this study
- Patient age \leq 18 yrs

Patient with

- a. Severe high blood pressure
- b. Orthostatic hypotension

MATERIALS AND METHODS

The study has been done in Dept. of Surgery, Medical College Baroda and SSG Hospital, the period of which has extended from March 2018 to Dec 2019.

Duration of Study: One year 10 months, (March 2018 to Dec 2019).

Type of Study: Prospective Randomized Control trial
Sample Size: A total of 92 patients were taken in this study out of which 46 were allocated to the case group and 46 to the control group.

Methods

All patients undergoing Open Milligan Morgan haemorrhoidectomy was divided in two group.

Group A (ODD) -was given Topical Diltiazem 2% and rescue analgesic for pain relief.

Group B (EVEN)-was given analgesic, Tablet Tramadol 50 mg 1BD for 3 days.

1gm Diltiazem ointment 2% was measured by spoon and applied to the patient by surgeon's index finger and applied circumferentially over haemorrhoidectomy wound, immediate post-operative time in OT before shifting patient to recovery room. Then next day morning in ward Diltiazem ointment 2% was applied over haemorrhoidectomy wound by resident doctor thrice a day in left lateral position for 3 days.

- Pain intensity was measured by visual analogue scale (VAS) as shown in figure 1.
- Pain assessment was done at 24hrs, 48hrs and 72 hrs after the end of the surgical procedure.
- Rescue medication: tablet Tramadol 50 mg 1 SOS
- Indication of rescue medication: Visual Analogue Scale score ≥ 6 .
- Patient was instructed to remain in supine position for sometime and watch for any complication if occurs then report to the doctor.

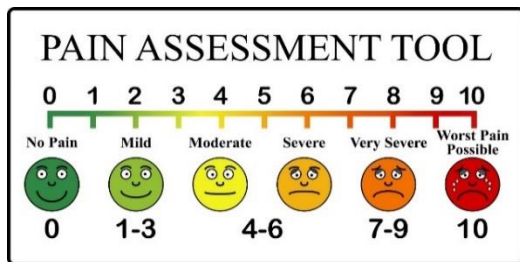


Figure 1: Pain assessment tool.

RESULTS

Total number of 92 patients were taken into the study and were then divided into cases and controls. 46 patients were taken into each group.

Age (Years)	No. of Patients	Cases	Controls	Percentage
21-30 y	14	6	8	15.21%
31-40 y	28	18	10	30.43%
41-50 y	20	12	8	21.73%
51-60 y	18	6	12	19.56%
61-70 y	12	4	8	13.04%

Table 1: Age wise distribution of patients.

Age distribution

It was observed that majority of the patients (30.43%) were in the 31-40 years of age group. Distribution of patient according to the age is as shown in (Table 1).

This suggests that in this age group, patients were motivated to undergo operative procedure for symptomatic hemorrhoids.

Relation of Age to VAS scores in Case group

It was observed that 21-30 years and 61-70 years age group had slightly higher VAS scores as compared to other age groups as shown in (Table 2).

Age (Years)	Vas @24hour	Vas @48hour	Vas @72hour
21-30 y	5.83	1.67	0.50
31-40 y	5.61	1.44	0.44
41-50 y	5.50	1.75	0.58
51-60 y	5.17	1.0	0.50
61-70 y	5.75	1.5	0.50

Table 2: Relation of Age to VAS scores in Case group (average VAS score).

Relation of Age to VAS scores in Control group

It was observed that 21-40years age group had higher VAS scores as compared to other groups as shown in Table 3.

Age (Years)	Vas @24hour	Vas @48hour	Vas @72hour
21-30 y	6.38	3.88	2.50
31-40 y	6.30	3.80	2.00
41-50 y	5.63	3.50	1.88
51-60 y	5.75	3.33	1.83
61-70 y	6.0	3.63	1.88

Table 3: Relation of Age to VAS scores in Control group (average VAS score).

VAS Score Analysis

At 24 hours intervals there was no significant difference seen. Only 9 patients had VAS score more than 6 and they needed rescue medicine (Tablet Tramadol 50mg) only one time.

At 48 hours and 72 hours, VAS Scores were checked and it was found that the control group clearly had a higher

number. This was a significant difference as shown in Table 4.

	VAS at 24 hour	VAS at 48 hour	VAS at 72 hour
Case	5.6	1.5	0.5
Control	6	3.6	2

Table 4: VAS scores (average VAS).

It is therefore clearly observed that the patients who were applied 2% Topical Diltiazem experienced little or no pain. However, on the other hand the control group in which regular analgesic was given, complained of post-operative pain.

Inference

At 24 hours intervals there was no significant difference seen. At 48 hour and 72 hours VAS, the p value was calculated to be less than 0.05 which shows a significant difference between the case and control groups. The patients applied 2% Topical Diltiazem ointment had lower pain scores as compared to those who received Tablet Tramadol as shown in Table 5.

Group	N	Mean	SD	P-VALUE
Case	46	5.56	1.13	0.085
Control	46	6	1.26	
Total	92			
Case	46	1.5	1.03	<0.00001
Control	46	3.6	0.99	
Total	92			
Case	46	0.5	0.51	<0.00001
Control	46	2.00	0.84	
Total	92			

Table 5: Analysis.

Other complications

It is seen that urinary retention was seen more in patients the control group as compared to the cases group. This can be attributed to the fact that pain led to urinary retention in the control group. Two of these patients required catheterization. However, the catheter was removed the following day with spontaneous passing of urine. It is therefore advisory to have a good post-operative analgesia for patients undergoing surgery for hemorrhoids. Bleeding was seen in one patient in the control group. It was only a

few milliliters and did not require transfusion. Bleeding stopped with adequate compression followed by padded dressing at bedside. Post-operative nausea and vomiting was seen in three patients in the control group and none in the cases group. It was controlled on giving antiemetic (Tablet Domperidone 10 mg sos). Light headache was seen in 2 patients and dizziness was seen in 2 patient of case group.

DISCUSSION

Hemorrhoidectomy is usually associated with considerable pain during the postoperative period, which may delay discharge, recovery, and return to work. Accordingly, a variety of methods for reducing pain after hemorrhoidectomy have been investigated, including pudendal nerve block, perianal infiltration of local anesthetics or botulinum toxin, and application of topical preparation such as metronidazole, glyceryl nitrate, and calcium channel blocker [22].

Diltiazem, a hydrophilic benzothiazepine, is an L-type calcium channel antagonist given orally for treatment of various cardiovascular disease [23].

Postoperative pain and defecation difficulty immediately after surgery are major clinical problems following hemorrhoidectomy.

The meta-analysis demonstrated that the use of Topical Diltiazem was associated with a more significant improvement and relief of anal pain after hemorrhoidectomy and a lower use of additional oral pain killers with fewer side effects.

Higher resting anal pressure was believed to be present in patient with anal fissure and haemorrhoids [24-25] painful spasm of internal anal sphincter leading to the high pressure zone in the anal canal is also thought to be the source of pain after anal surgery and may contribute to post haemorrhoidectomy pain [26].

Maintenance of smooth muscle tone of internal sphincter is a calcium dependent mechanism and the use of calcium channel blockers causes relaxation of gastrointestinal smooth muscle [8-11].

Diltiazem acts by inhibiting the flow of extracellular calcium ions into the sarcoplasm of internal anal sphincter with a consequent saving of oxygen, resulting in muscle relaxation and pain relief [27], it would therefore seem reasonable to apply medication aimed at reducing internal sphincter pressure which might be beneficial in reducing anal pain after haemorrhoidectomy.

This metanalysis has shown that the post-operative use of 2% Diltiazem ointment is statistically significant in reducing post-operative pain at 48 hours and 72 hours.

This was confirmed by carapeti et al. who showed that a single dose of 60mg diltiazem lowered the maximum resting anal sphincter pressure by a mean of 21% [20].

Amoli and associates prospectively evaluated a role of topical 2% diltiazem application after haemorrhoidectomy and concluded that perianal application of diltiazem ointment after haemorrhoidectomy significantly reduces postoperative pain [18].

Chauhan et al prospectively randomised 108 patients of Third- and fourth-degree haemorrhoids and assessed the efficacy of internal sphincterotomy compared with topical application of 2% Diltiazem ointment after haemorrhoidectomy for pain relief. They encountered no significant difference in mean pain scores on second postoperative day as both the procedure relieve the spasm of anal sphincter [21].

Silverman et al evaluated the effect of Topical Diltiazem in reducing pain after haemorrhoidectomy. They randomly assigned 18 patients of haemorrhoidectomy to receive 2% Diltiazem and placebo ointment and noticed mean pain scores of 5.2 in the diltiazem group as

compared to 8.8 in the placebo group the second postoperative day [19].

In this study average pain scores after using 2% Topical Diltiazem ointment at 48 hours was 1.5 as compared control group 3.6 and at 72 hours was 0.5 as compared control group 2.0 which is nearly comparable to above mentioned studies. Hence, there was significant reduction of haemorrhoidectomy pain at 48 hours and 72 hours in patients who applied 2% Topical Diltiazem ointment.

The control group had more patients who had a complaint of post- operative nausea and vomiting due to side effect of Tablet Tramadol.

Some advantages of the current study are worth highlighting. We included only elective, Open Milligan Morgan Hemorrhoidectomy in our study to avoid the type, nature, and duration of pain associated with different types of surgery. Moreover, all the observations were carried out by a single observer to eliminate any inter observer variability. Thus, we can assume that the difference in pain relief reflects only the efficacy of the antinociceptive measures.

VAS score analysis

In the current study, it is clearly seen that VAS scores are lower in the group which was given 2% Topical Diltiazem. Patients in the control group felt post- operative pain in the first 72 hour of post-operative time. This also led to the increased incidence of use of tablet tramadol in the control group.

Therefore, in line with the previous study, this study also had results which confirms the efficacy on Topical Diltiazem 2% in reducing the VAS scores.

Age distribution

In this study, majority of the patients belonged to 31-40 years of age group.

It was observed that VAS scores were higher in age group of 21-30 years and 61-70 years in case group.

In the control group VAS scores were higher in 21- 40 years age group.

In the study conducted by S Suchdev et al control group had a mean age group of 39.85 (\pm 14.91) and case group had a mean age of 37.73 (\pm 14.90); the difference between two means was statistically insignificant (p-value=0.637).

There was a slight difference in the age group as compared to the previous studies showing predominance in the 31-50 years of age group.

Other postoperative complications

In this study case group had one patient with urinary retention for which he was catheterized. On the other-hand control group had 3 patients with urinary retention post operatively which he was catheterized. Bleeding was seen in one patient of the control group and none in the case group. Post-operative nausea and vomiting was seen in 3 patients of control group and none in the case group.

This shows that there was a higher rate of complications possible pertaining to pain in the control group as compared to those in the case group.

SUMMARY

This study 92 patients were taken who were distributed equally into two groups.

From this study, it is evident that the effect of 2% Topical Diltiazem ointment is a positive one and majority of the patients who were in this group didn't complain of pain postoperatively. On the contrary, in the control group the patients invariably complained of pain and had to be given pain medications.

In this study at 24 hours intervals there was no significant difference seen.

At 48 hours and 72 hours, VAS scores were checked and it was found that the control group clearly had a higher number. This was a significant difference. Majority of the patients were in the age group of 31-40. The patients who participated in this trial were mainly those who had grade 3 and grade 4 symptomatic hemorrhoids.

Patients in the control group seemed to have higher post-operative urinary retention and post-operative nausea and vomiting rates. This finding could be possibly attributed to pain.

The VAS scores observed clearly indicates the efficacy of 2% Topical Diltiazem in preventing post-operative pain in open hemorrhoidectomies.

CONCLUSION

The analgesic effect of local 2% Topical Diltiazem ointment contributes to improvement in pain control after open hemorrhoidectomy. The technique is simple and easy to learn. Further, it can be performed in a few minutes. Diltiazem have fewer side effects profile making it a safe drug for this use. Hence, pain which is a major complication of open Milligan Morgan Hemorrhoidectomy surgeries can be easily dealt with this method of pain control.

We conclude by recommending that 2% topical diltiazem ointment is not only effective but is also a safe procedure, and can be a better alternative strategy for reducing the pain of patients who are undergoing open Milligan Morgan Haemorrhoidectomy.

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CONFLICT OF INTEREST

None declared.

ETHICAL APPROVAL

Required and approved.

REFERENCES

1. CJ H (1946) History of hemorrhoidal surgery. Southern Medical Journal 39: 536-541.
2. Madoff RD (1991) Biblical management of anorectal disease. In meeting of the Midwest Society of Colon and Rectal Surgeons. Breckenridge, CO.
3. King DF (1985) The biblical plague of "hemorrhoids" An outbreak of bilharziasis. The American Journal of Dermatopathology 7(4): 341-346.
4. Rosner F, Muntner S (1969) The Medical Writings of Moses Maimonides. Treatise on Hemorrhoids and Maimonides 'Answers to Queries.
5. Racouchot JE, Pétouraud C, Rivoire J (1971) The healer of haemorrhoids and patron saint of proctology. American Journal of Proctology 22(2): 175-179.
6. Manfredelli S, Montalto G, Leonetti G, et al. (2012) Conventional (CH) vs. stapled hemorrhoidectomy (SH) in surgical treatment of hemorrhoids. Ten years' experience. Annali Italiani di Chirurgia 83(2): 129-34.
7. Schuurman JP, Rinkes IHB, Go PM (2012) Hemorrhoidal artery ligation procedure with or without Doppler transducer in grade II and III hemorrhoidal disease: a blinded randomized clinical trial. Annals of Surgery 255(5): 840-845.
8. Carapeti EA, Kamm MA, Evans BK, et al. (1999) Topical diltiazem and bethanechol decrease anal sphincter pressure without side effects. Gut 45(5): 719-722.
9. Jonard PH, Essamri B (1987) Diltiazem and internal anal sphincter. The Lancet 329(8535): 754.
10. Staneva-Stoytcheva D, Venkova K (1992) Effects of the Calcium Antagonists Diltiazem, Verapamil and Nitrendipine on the Contractile Responses of Guinea-pig Isolated Ileum to Electrical Stimulation or Carbachol. Journal of Pharmacy and Pharmacology 44(4): 321-325.
11. Morales-Olivas FJ, Cortijo J, Esplugues JV, et al. (1985) Effect of verapamil and diltiazem on isolated gastro-oesophageal sphincter of the rat. Journal of Pharmacy and Pharmacology 37(3): 208-209.
12. Ellesmore S, Windsor ACJ (2002) Surgical history of haemorrhoids. In Surgical Treatment of Haemorrhoids, Springer, London (pp. 1-4).
13. Shampo MA (1998) Brief history of colorectal surgery. Female Pelvic Medicine & Reconstructive Surgery, 4(6): 257-259.
14. Milligan ETC, Morgan CN, Jones L, et al. (1937) Surgical anatomy of the anal canal, and the operative treatment of haemorrhoids. The Lancet 230(5959): 1119-1124.
15. Adotey JM, Jebbin NJ (2004) Anorectal disorders requiring surgical treatment in the University of Port Harcourt Teaching Hospital, Port Harcourt. Nigerian Journal of Medicine: Journal of the National Association of Resident Doctors of Nigeria 13(4): 350-354.
16. Uba AF, Ihezue CH, Obekpa PO, et al. (2001) Open haemorrhoidectomy revisited. Nigerian Journal of Medicine: Journal of the National Association of Resident Doctors of Nigeria 10(4): 185-188.
17. Uba AF, Obekpa PO, Ardill W (2004) Open versus closed haemorrhoidectomy. The Nigerian Postgraduate Medical Journal 11(2): 79-83.
18. Amoli HA, Notash AY, Shahandashti FJ, et al. (2011) A randomized, prospective, double-blind, placebo-controlled trial of the effect of topical diltiazem on posthaemorrhoidectomy pain. Colorectal Disease 13(3): 328-332.

19. Silverman R, Bendick PJ, Wasvary HJ (2005) A randomized, prospective, double-blind, placebo-controlled trial of the effect of a calcium channel blocker ointment on pain after hemorrhoidectomy. *Diseases of the Colon & Rectum* 48(10): 1913-1916.
20. Carapeti EA, Kamm MA, Evans BK, et al. (1999) Topical diltiazem and bethanechol decrease anal sphincter pressure without side effects. *Gut* 45(5): 719-722.
21. Chauhan A, Thomas S, Bishnoi PK, et al. (2007) Randomized controlled trial to assess the role of raised anal pressures in the pathogenesis of symptomatic early hemorrhoids. *Digestive Surgery* 24(1): 28-32.
22. Cheetham MJ, Phillips RKS (2001) Evidence-based practice in haemorrhoidectomy. *Colorectal Disease* 3(2): 126-134.
23. Triggler DJ (1990) Calcium, calcium channels, and calcium channel antagonists. *Canadian Journal of Physiology and Pharmacology* 68(11): 1474-1481.
24. Arabi Y, Alexander-Williams J, Keighley MRB (1977) Anal pressures in hemorrhoids and anal fissure. *The American Journal of Surgery* 134(5): 608-610.
25. Patti R, Almasio PL, Arcara M, et al. (2007) Long-term manometric study of anal sphincter function after hemorrhoidectomy. *International Journal of Colorectal Disease* 22(3): 253-257.
26. Loder PB, Kamm MA, Nicholls RJ, et al. (1994) Haemorrhoids: pathology, pathophysiology and aetiology. *British Journal of Surgery* 81(7): 946-954.
27. Cook TA, Brading AF, Mortensen NM (1999) Differences in contractile properties of anorectal smooth muscle and the effects of calcium channel blockade. *British Journal of Surgery* 86(1): 70-75.
28. Prasad ML, Abcarian H (1978) Urinary retention following operations for benign anorectal diseases. *Diseases of the Colon & Rectum* 21(7): 490-492.
29. Khubchandani IT (2002) Internal sphincterotomy with hemorrhoidectomy does not relieve pain. *Diseases of the Colon & Rectum* 45(11) 1452-1457.