



1 revealed a significant decrease in the bleeding and pain in the trial group compared to the  
2 control, but no significant difference in the extent of prolapse. The patients in the control  
3 group who switched to a squatting defecation posture reported significantly less bleeding,  
4 prolapse and pain .The percentage of patients with complete cessation of bleeding and  
5 pain was significantly greater in the trial group and in patients who reverted to a squatting  
6 defecation posture after being treated medically.

7 **Conclusion.** Changing from a sitting to a squatting defecation posture causes a  
8 significant reduction in the intensity or a complete resolution of symptoms associated  
9 with hemorrhoids.

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## Introduction

12 The average individual strains significantly more during defecation while seated on  
13 a toilet bowl of standard or low height than in a squatting posture (1). There is common  
14 agreement in the literature that excessive straining during defecation is one of the major  
15 factors of hemorrhoids (2). We evaluated the influence of the reduced amount of straining  
16 that is required in the squatting defecation posture on the course of chronic internal  
17 hemorrhoids.

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## Methods

19 The current study was performed by 12 primary care physicians in the setting of  
20 their practice of family medicine. Each of the physicians does work separately at his own  
21 clinic. Six of the physicians followed up the patients who switched from a sitting to a  
22 squatting posture during defecation (trial group) and the other six did the same for the  
23 patients given standard medical treatment (control group). Each physician was asked to

1 enroll in his group only six consecutive patients, in order to include an equal number of  
2 patients in the trial and control groups. The sample size calculation was based on  
3 observations from a preliminary report (3). The relatively large number of the physicians  
4 that took part in the trial can be explained by the aim to augment the objectivity of trial.  
5 The integration of the physicians in the trial was gradual, and the pace of patient  
6 recruitment varied from physician to physician. The trial lasted for one year.

7 Entry criteria included chronic internal hemorrhoid disease defined by bleeding and  
8 prolapse as well as any accompanying symptoms. The other criterion for including the  
9 patients into the trial was the diagnosis of hemorrhoids during at least one visit in the  
10 course of their illness to proctologic or gastroenterological clinics. Exclusion criteria  
11 included the inability to assume a squatting posture for any reason and less than one or  
12 more than three bowel movements per day in order for the cohort to represent the  
13 majority (94%) of the population at large (4). Patients who had undergone any invasive  
14 proctologic procedure were excluded as well as patients with irreducible prolapse, grade  
15 four according to Goligher classification (5), as this stage is associated with irreversible  
16 destruction of hemorrhoid plexus.

17 . The stages of the hemorrhoids with their symptomatic equivalent were precisely  
18 defined (5, page 101) enabling diagnosis and follow up of the hemorrhoids based on  
19 clinical data. In addition the patients were asked to define the intensity of their symptoms  
20 on a scale of 5: nonexistent (0), very mild (1), mild (2), moderate (3), and severe (4). The  
21 attending physicians graded the symptoms of hemorrhoids based on the patient's  
22 subjective assessment of their symptoms as well as on the conventional staging of  
23 hemorrhoids (5).

1 After the patients underwent physical examination, which included the inspection of  
2 the anal area and a digital examination of the ano-rectum, a standardized questionnaire on  
3 the type and severity of the symptoms was filled out. The questionnaire was identical for  
4 the trial and control groups and was administrated by the attending physician.

5 A signed informed consent was received from the patients of the trial group and the  
6 study was conducted according to the ethical guidelines of the Declaration of Helsinki.

7 In the trial group, after informing the patients about existing conventional methods  
8 of treatment of hemorrhoids they were instructed to defecate only in the squatting  
9 position and only in the flat container that was provided. The patients were strongly  
10 discouraged from attempting to squat over a standard toilet bowl since the typical water  
11 toilet bowl does not permit a convenient squatting defecation posture. Furthermore cases  
12 of standard toilet bowls breaking while people have squatted on its edges have been  
13 known to occur making it dangerous to do so.

14 Patients in the control group received the standard conventional medical treatment  
15 with ointments, suppositories and bulk- forming agents (conventional doses of psyllium).

16 The patients were questioned about any changes in the severity of their symptoms  
17 two weeks following bowel emptying in the squatting posture (trial group) or medical  
18 treatment (control group) and their subjective scores were recorded in the appropriate  
19 questioner administered by the attending physician. The decision regarding the duration  
20 of the trial was based on the observations from the preliminary report (3).

21 The patients in the control group whose symptoms were not relieved as a result of  
22 the medical treatment were advised to discontinue treatment and to switch to defecating  
23 in a squatting posture and thus began the trial part of their own control study. The scores

1 that were derived from their medical treatment were used as baseline values for the trial  
2 part of their own control study. The trial part of their own control study was conducted  
3 according to the same principles as described for the trial group.

4 Statistical analysis: The body mass index (BMI), age and baseline intensities of the  
5 symptoms (before medical treatment and before switching to a squatting defecation  
6 posture) of the two groups were compared based on the Mann-Whitney non-parametric  
7 test, and the gender of the participants according to the Chi-Square test. The group  
8 differences in the intensity of symptoms before and after medical treatment and before  
9 and after changing from a sitting to a squatting defecation posture and their interactions  
10 were analyzed using the Cochran –Mantel Haenszel test. The variation analysis was done  
11 using a mixed model. The paired analysis of the intensities of symptoms after medical  
12 treatment and after switching from a sitting to a squatting defecation posture in the own  
13 control part of the study was done by Wilcoxon Signed Ranks Test. Significance was set  
14 at  $P < 0.05$ .

## 15 **Results**

16 Sixty eight consecutive patients with chronic internal hemorrhoid disease lasting from  
17 several months to several years were recruited for the trial (34 patients) and control (34  
18 patients) groups. The patients presented with bleeding and prolapse, the principle  
19 symptoms of chronic internal hemorrhoids. Most of the patients however also complained  
20 of pain and some of irritation and itching during defecation. There were 19 male and 15  
21 female in the trial group and 24 male and 10 female in the control group without  
22 statistical differences ( $P=0.21$ ) between the groups. There were also no statistical  
23 differences between the groups regarding age (mean 41 years for the trial group and 39

1 years for the control group,  $P=0.86$ ) and BMI (mean 24, 8 and 24, 7, respectively,  
2  $P=0.87$ ).

3 The patients in the trial group scored the intensities of all five symptoms (bleeding,  
4 prolapse, pain, irritation, itching) as having diminished significantly ( $P<0.0001$ ) while the  
5 patients who received medical treatment scored a significant ( $P<0.0001$ ) reduction in the  
6 intensity of only two symptoms, bleeding and pain.

7 The baseline intensities of the bleeding and pain parameters were not statistically  
8 different ( $P=0.86$ ) between the groups. The group comparison revealed that switching  
9 from a sitting to a squatting defecation posture more significantly reduced bleeding  
10 (0.0003) and pain (0.0032) than the medical treatment (Fig 1). There were group  
11 differences in the baseline intensities of prolapse, irritation and itching. Switching from a  
12 sitting to a squatting defecation posture did not cause a significant reduction in the  
13 prolapse and irritation severity scores compared to medical treatment, but the scores for  
14 the severity of itching diminished significantly (0.0121) in the trial group.

15 Some patients who failed to experience relief from medical treatment refused to  
16 accept the offer to stop treatment and switch to a squatting posture during defecation,  
17 mainly for esthetic reasons, and this decreased the number of patients available for the  
18 own control part of the study ( 25 patients with bleeding, 24 with pain, 26 with prolapse  
19 and 33 with itching). A paired analysis revealed that the change from a sitting to a  
20 squatting defecation posture in the trial part of the own control study caused a significant  
21 diminishment in bleeding ( $P<0.0001$ ), prolapse (0.004) and pain ( $P<0.0001$ ) compared to  
22 the control part of the own control study (Fig 2). There was no significant difference in

1 the scores for severity of irritation and itching between the trial and the control parts of  
2 the own control study.

3 The percentage of the patients with complete cessation of bleeding and pain was  
4 significantly higher in the trial group and the trial part of the own control study than in  
5 the controls; however, this difference did not apply to complete cessation of prolapse,  
6 irritation and itching (Table 1). Complete cessation of the prolapse occurred mainly in  
7 patients with mild or very mild prolapse.

8 Interviews of the patients during follow-up revealed that some of them whose  
9 symptoms had resolved consequent to their adopting the squatting defecation posture had  
10 tried to return to a sitting defecation posture-mainly due to absence of squatting toilet  
11 facilities. Nonetheless, the reappearance of their symptoms motivated them to return to a  
12 squatting defecation posture.

### 13 **Discussion**

14 The most important message of the trial is that six primary care physicians of  
15 the trial group and the six others of the trial part of the own control study found that such  
16 a simple act of changing from a sitting to a squatting defecation posture alleviates or  
17 completely eliminates hemorrhoid symptoms. Patients who switch to a squatting  
18 defecation posture early in the course of hemorrhoids experience a more distinct  
19 diminishment in the intensity of symptoms. In the progressive stages of hemorrhoids,  
20 such as prolapse, which is associated with anatomical changes of the hemorrhoid tissue (5)  
21 the alleviation of symptoms of hemorrhoids is less with the change in posture.

22 Pain is not usually considered to be a symptom of chronic internal hemorrhoids  
23 (5) however as in our trial, Bennet et al. found some pain in 86% of 138 hemorrhoid

1 patients (6) and Murie et al. in 54% of 82 patients (7). Anal irritation may accompany  
2 hemorrhoids (5, page 102) while a local skin condition in the perianal area can explain  
3 the itching.

4         Partial or complete resolution of hemorrhoid symptoms among patients who  
5 switched from a sitting to a squatting defecation posture may be explained by the less  
6 expulsive effort needed to defecate in a squatting posture (1) thus preventing injury to the  
7 hemorrhoid plexus. The explanation for the diminished expulsive defecation effort in a  
8 squatting posture relates to the dynamics of the recto anal canal forming an approximate  
9 right angle (8, 9), which straightens with fully flexed hips-- corresponding to the  
10 squatting position assumed for defecation--and converts the recto anal outlet into a  
11 straight canal , thereby facilitating rectal emptying (10). For this reason, patients with less  
12 than one bowel movement per day were excluded from the trial since some of them suffer  
13 from constipation accompanied by an immobile perineum and an adynamic recto-anal  
14 angle (11).

15         Burkitt D.P. found a very low prevalence of hemorrhoids in rural Africa and  
16 hypothesized that the high fiber diet which is typical for rural African populations is  
17 responsible for this phenomenon (12), ignoring the fact that people in these regions  
18 empty their bowels in a squatting posture in pit latrines (13). High fiber diets cause large  
19 rectal volumes (14) and evoke the recto anal inhibitory reflex (15) thus somewhat  
20 reducing the expulsive defecation effort (16).The major factor in the control of the  
21 passage of solid rectal content, however is not the anal sphincters but the angle between  
22 the rectum and that of the anal canal (17,18). Indeed, bulk-forming agents were tested in  
23 the treatment of hemorrhoids and were found to relieve the symptoms only slightly better



1 (P< 0.025) than placebo after six weeks in one study (19), and no better than placebo  
2 after three months of treatment in another study (20).

3 Numerous explanations have been offered to account for the development of  
4 hemorrhoids, such as hard stool, pregnancy, labor, violent exercise and others (5). We  
5 contend that these are only the triggers: the major factor that maintains and perpetuates  
6 the disease is the excessive expulsive defecation effort that is needed in the sitting posture.  
7 This explains why events common to all mankind, such as pregnancy, labor, occasional  
8 hard stool, violent exercise and others only rarely cause hemorrhoids in third world  
9 countries (12) in which squatting toilets are used, while the frequency of hemorrhoids  
10 has reached epidemic dimensions in the western world (21) in which the sitting  
11 defecation posture is commonplace. The occurrence of hemorrhoids can be traced back to  
12 antiquity (5), but so can sit toilet commodes for mostly the old, weak and handicapped,  
13 with the great majority of people habitually emptying their bowels in a squatting posture  
14 (22). Indeed, the widespread use of the sitting toilets in the Western world began only  
15 during the 19<sup>th</sup> century when sewage systems were developed to improve sanitation, as  
16 cities grew (22).

17 Conclusion. The results of the present trial together with epidemiological data in the  
18 medical literature indicate that the prevalence of hemorrhoids in the Western World will  
19 sharply diminish by having people in the Western World switch to a squatting defecation  
20 posture.

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1 **Table 1 The percents of patients with complete cessation of symptoms.**

Symptoms	Patients (N)	Trial	Control	The own control study		P-value
				Trial part	Control part	
<b>Bleeding<sup>f</sup></b>	<b>34</b>	<b>50%</b>	<b>8.8%</b>			0.001
Bleeding <sup>#</sup>	25			68%	4%	<0.0001
<b>Pain<sup>f</sup></b>	<b>34</b>	<b>38.2%</b>	<b>8.8%</b>			0.004
Pain <sup>#</sup>	24			62.5%	8.3%	<0.0001
<b>Prolapse<sup>f</sup></b>	<b>34</b>	<b>17.6%</b>	<b>2.9%</b>			NS
Prolapse <sup>#</sup>	26			15.4%	0%	NS
<b>Irritation<sup>f</sup></b>	<b>34</b>	<b>29.4%</b>	<b>0%</b>			NS
Irritation <sup>#</sup>	34			11.8%	0%	NS
<b>Itching<sup>f</sup></b>	<b>34</b>	<b>14.7%</b>	<b>0%</b>			NS
Itching <sup>#</sup>	33			3%	0%	NS

2 <sup>f</sup> After switching from a sitting to a squatting defecation posture (trial), or

3 completion of medical treatment (control).

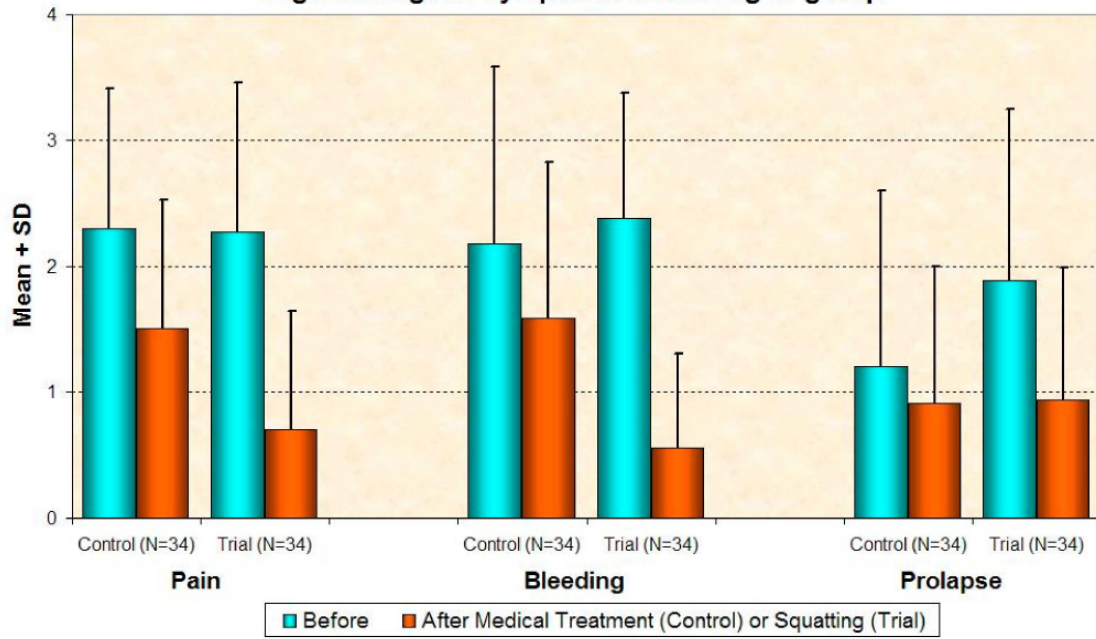
4 <sup>#</sup> After switching from a sitting to a squatting defecation posture (trial part of own

5 control study) or after completion of medical treatment (control part of own control

6 study).

7 (N)-number of patients for each group. NS-non significant.

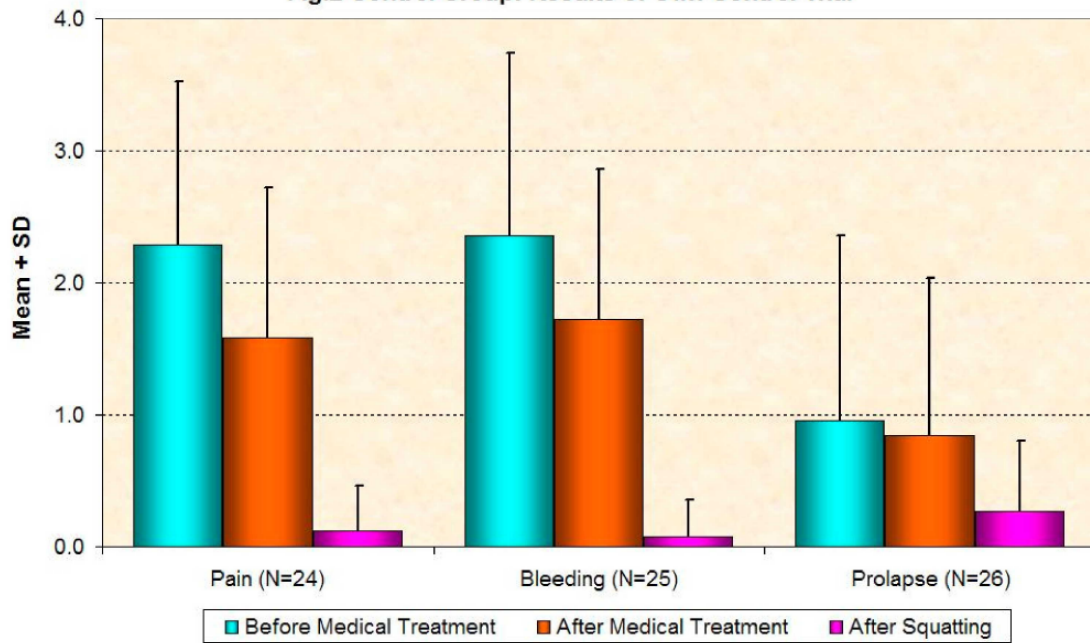
**Fig.1 Change in Symptoms according to group**



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**Fig.2 Control Group: Results of Own-Control Trial**



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4 **References**

5 1 Sikirov DA, Comparison of Straining During Defecation in Three Positions. Results  
6 and Implications for Human Health. Digestive Diseases and Sciences 2003; 48: 1201-  
7 1205.

8 2 Graham-Stewart CW: What causes hemorrhoids? Diseases Colon Rectum 1963; 6: 333-  
9 344.

10 3 Sikirov DA, Management of hemorrhoids: A new approach. Israel J. Med. Sci. 1987;  
11 23: 284-286

12 4. Connel AM, Hilton C, Irvine G et al. Variation of bowel habit in two population  
13 samples. Br Med J 1965; 2:1095-1099.

14 5 Goligher JC. Surgery of the Anus Rectum and Colon Fourth Edition,  
15 Bailliere,Tindall.London 1980: 93-149.

16 6 Benet RS and Goligher JC Results of internal sphincterectomy for anal fissure Br.Med.J.  
17 1962; 2:1500

18 7 Murie et al. Comparison of rubber band ligation and haemorrhoidectomy for second-  
19 and third-degree hemorrhoids: a prospective clinical trial.Br. J.Surgery 1980; 67:786.

20 8. Gray DJ, Rectum and anal canal .In: Gardner SE, Gray DJ, Rahilly RO. Anatomy.4<sup>th</sup>  
21 ed. Philadelphia: WB Saunders, 1975:486.

22 9. Shorvon P J, M.cHugh S, Diamant NE, et al. Defecography in normal volunteers:  
23 results and implications. Gut 1989; 30: 1737-1749.

- 1 10. Tagart RE: The anal canal and rectum: their varying relationship and its effect on anal  
2 continence. *Disease Colon Rectum* 1966; 9: 449-452.
- 3 11. Pezim ME, Pemberton JH, Levin KE, Litchy WJ, et al, Parameters of anorectal and  
4 colonic motility in health and in severe constipation. *Disease Colon Rectum* 1993; 36:  
5 484-491.
- 6 12 Burkitt DP, Hemorrhoids, varicose veins and deep vein thrombosis: epidemiological  
7 features and suggested causative factors. *The Canadian journal of surgery* 1975; 18: 483-  
8 488.
- 9 13 Peoples of Africa. Edited by Gibbs JL. Holt J, Rineart and Winston Inc. New York,  
10 Chicago, San Francisco, Toronto, London. 1965; 119.
- 11 14 Eastwood MA, Kirkpatrick JR, Mitchell WD, et al. Effects of dietary supplements of  
12 wheat bran and cellulose on faces and bowel function. *British Medical Journal* 1973; 4-15
- 13 15 Ihre T, Studies on anal function in continent and incontinent patients. *Scandinavian*  
14 *Journal of Gastroenterology*, 1974; 9 (Supplement), 25: 392-394.
- 15 16 Bannister JJ, Davison P, Timms JM, et all. Effect of stool size and consistency on  
16 defecation. *Gut* 1987; 28: 1246-1250.
- 17 17 Duthie HL, Dynamics of the Rectum and Anus. In: *Clinics in Gastroenterology* WB  
18 Saunders 1975; 4:467-476.
- 19 18 Altomare DF, Rinaldi M, Veglia A., Contribution of posture to the maintenance of  
20 anal continence. *Int. J. Colorectal Dis.* 2001; 16: 51-54.
- 21 19 Webster DJT, Gough DCS and Craven JL The use of bulk evacuant in patients with  
22 hemorrhoids *Br.J.Surg.* 1978; 65: 291-292.

1 20 .Broader JH, Gunn IF, Alexandr-Williams J, Evaluation of a bulk-forming evacuant in  
2 the management of hemorrhoids. Br. J. Surgery. 1974; 61:142-144.

3 21. Johanson JF, Sonnenberg A. The prevalence of Hemorrhoids and Chronic  
4 Constipation. Gastroenterology 1990; 98:380-386.

5 22 History of Technology , Singer C, Holmyard A, Hall A, Williams T, eds. Oxford  
6 Clarendon Press 1958.

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