



"Clinical Efficacy and Patient Satisfaction of Foam Sclerotherapy for Hemorrhoid Treatment"

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Abstract

Background: Hemorrhoids are a common anorectal disorder affecting a large portion of the population, often causing symptoms such as bleeding, prolapse, and pain. Traditional treatment options include conservative management and invasive procedures, but they can be associated with complications and prolonged recovery times. Foam sclerotherapy has emerged as a minimally invasive alternative, offering potential advantages in terms of efficacy, safety, and recovery.

Aim: This study aims to evaluate the clinical outcomes and patient satisfaction with foam sclerotherapy for the treatment of hemorrhoids in a tertiary care setting.

Methods: A prospective cohort study was conducted at the Indira Gandhi Institute of Medical Sciences, Patna, involving 100 patients diagnosed with grade II or III internal hemorrhoids. Patients underwent foam sclerotherapy under local anesthesia. Clinical outcomes, including the reduction of symptoms such as bleeding, prolapse, and pain, were assessed at baseline and at follow-up intervals of 1, 3, and 6 months. Patient satisfaction was evaluated using a standardized questionnaire. Data were analyzed using SPSS version 23.0, with paired t-tests and chi-square tests for statistical significance.

Results: Significant improvements were observed in all clinical outcomes. Bleeding decreased from 85% to 20%, prolapse from 70% to 10%, and pain from 80% to 15%. Overall improvement was reported by 95% of patients. Adverse events were minimal, with 12% of patients reporting mild injection site pain and 8% experiencing temporary bleeding. Patient satisfaction was high, with 90% of patients expressing satisfaction, citing ease of the procedure and fast recovery as key factors.

Conclusion: Foam sclerotherapy is an effective and safe treatment for hemorrhoids, offering significant clinical improvement with minimal adverse events. It provides high patient satisfaction and can be considered a viable alternative to more invasive treatments.

Recommendations: Given its effectiveness and low complication rate, foam sclerotherapy should be considered as a first-line treatment for grade II and III hemorrhoids. Further studies with larger sample sizes and long-term follow-up are recommended to confirm its long-term safety and efficacy.



Introduction

Hemorrhoids are one of the most common anorectal disorders, affecting a significant portion of the adult population globally. It is estimated that approximately 50% of individuals will experience hemorrhoidal symptoms at some point in their lives, with prevalence increasing with age and in those with a sedentary lifestyle or poor dietary habits [1]. Hemorrhoids are classified into internal, external, and mixed types, with the majority of cases being internal. Internal hemorrhoids are graded based on their degree of prolapse, ranging from grade I (without prolapse) to grade IV (prolapsed and irreducible) [2]. Although hemorrhoidal disease (HD) is not life-threatening, it significantly impacts the quality of life, causing discomfort, bleeding, and, in some cases, severe pain [3].

Various treatment options are available for hemorrhoids, including conservative measures such as dietary modifications and topical treatments, as well as invasive procedures like rubber band ligation, infrared coagulation, and surgical hemorrhoidectomy [4]. However, these treatments come with varying degrees of success, potential complications, and recovery times, which makes selecting the optimal treatment challenging. Over the years, there has been growing interest in minimally invasive alternatives that provide effective relief with fewer complications and shorter recovery times. One such alternative is foam sclerotherapy, which has gained attention for its promising results in treating symptomatic hemorrhoids.

Foam sclerotherapy involves the injection of a sclerosant agent in foam form into the hemorrhoidal tissue, which causes vasoconstriction, tissue fibrosis, and eventual obliteration of the hemorrhoidal vessels. This technique has been reported to offer similar efficacy to other established treatments, such as rubber band ligation, but with fewer side effects and a quicker recovery period [5]. Recent studies have demonstrated its effectiveness in reducing symptoms such as bleeding, prolapse, and pain, with low rates of complications such as infection and thrombosis [6]. Moreover, patient satisfaction rates have been consistently high, likely due to the procedure's minimal invasiveness and ease of performance under local anesthesia [7].

Despite its promising results, foam sclerotherapy is still not as widely adopted as other treatments for

hemorrhoids. Therefore, further studies are necessary to assess its long-term outcomes, patient satisfaction, and safety profile in a diverse patient population. This study aims to evaluate the clinical outcomes and patient satisfaction with foam sclerotherapy for the treatment of hemorrhoids in a tertiary care setting.

Methodology

Study Design

This study was a prospective observational study.

Study Setting

The study was conducted in Department of general surgery, IGIMS..., Sheikhpura, Patna - 800 014 (Bihar), India. This tertiary healthcare center provided an ideal setting for patient recruitment and follow-up, ensuring standardized treatment protocols.

Participants

A total of 100 patients diagnosed with hemorrhoids were enrolled in the study. These participants underwent foam sclerotherapy and were followed up to assess treatment outcomes and satisfaction levels.

Inclusion and Exclusion Criteria

Inclusion Criteria:

- Patients diagnosed with symptomatic hemorrhoids (Grades I–III).
- Age between 18 and 70 years.
- Patients willing to undergo foam sclerotherapy and provide informed consent.
- Patients available for follow-up during the study period.

Exclusion Criteria:

- Patients with Grade IV hemorrhoids requiring surgical intervention.
- History of previous hemorrhoidal surgery within the past year.
- Presence of other anorectal diseases (e.g., anal fissures, fistulas).
- Patients with bleeding disorders or on anticoagulant therapy.



- Pregnant or lactating women.

Bias

To minimize selection bias, random sampling was used to recruit participants. Performance bias was controlled by standardizing the procedure and using the same sclerosing agent for all patients. Observer bias was reduced by blinding the data analysts to patient identities.

Data Collection

Data were collected through structured patient interviews, clinical examinations, and follow-up visits. Baseline demographic details, symptoms, and hemorrhoid grading were recorded before the procedure. Post-treatment assessments included symptom relief, complication rates, and patient satisfaction levels using a structured questionnaire.

Procedure

Foam sclerotherapy performed by the treating surgeon. Same surgery team performed the procedure for all the patient. The sclerosant foam was prepared by tessler's method polidocanol and injected into the hemorrhoidal cushions under direct visualization. Patients were monitored for immediate adverse reactions and discharged with post-procedure care instructions. Follow-up evaluations were conducted at 1, 3, and 6 months post-treatment.

Statistical Analysis

Data analysis was performed using **SPSS version 23.0**. Descriptive statistics, including mean and standard deviation, were used to summarize continuous variables. Categorical variables were analyzed using the chi-square test. A paired t-test was used to compare pre- and post-treatment symptom scores. Statistical significance was set at $p < 0.05$.

Results

The study was conducted on a total of 100 patients diagnosed with hemorrhoids and treated with foam sclerotherapy at the Indira Gandhi Institute of Medical Sciences, Patna, India. The following results summarize

the clinical outcomes, patient satisfaction, and statistical analysis of the treatment efficacy.

Table 1 shows the demographic characteristics of the participants, including age, gender, and clinical classification of hemorrhoids.

Table 1: Demographic Characteristics of Participants (n=100)

Parameter	Frequency	Percentage
Age Group		
18-30 years	15	15%
31-40 years	25	25%
41-50 years	30	30%
51-60 years	20	20%
61-65 years	10	10%
Gender		
Male	60	60%
Female	40	40%
Hemorrhoid Grade		
Grade II	70	70%
Grade III	30	30%

The majority of participants were between 31 to 50 years of age (55%). There was a higher proportion of male patients (60%) compared to female patients (40%). Grade II hemorrhoids were more common among the participants (70%), while 30% had grade III hemorrhoids.

Clinical Outcomes Post-Treatment

Clinical outcomes such as bleeding, prolapse, pain, and overall improvement were assessed before and after foam sclerotherapy. The table below presents the comparison of these clinical symptoms before and after the treatment.

Table 2: Comparison of Clinical Symptoms Before and After Foam Sclerotherapy

Clinical Symptom	Pre-Treatment	Post-Treatment	p-value
Bleeding	85 (85%)	20 (20%)	0.001



Prolapse	70 (70%)	10 (10%)	0.001
Pain	80 (80%)	15 (15%)	0.001
Overall Improvement	50 (50%)	95 (95%)	0.001

A significant reduction in bleeding (from 85% to 20%), prolapse (from 70% to 10%), and pain (from 80% to 15%) was observed post-treatment ($p < 0.05$ for all comparisons). The overall improvement rate was 95% post-treatment, demonstrating the efficacy of foam sclerotherapy in managing symptoms of hemorrhoids.

Adverse Events

The incidence of adverse events following foam sclerotherapy was also recorded and is presented in Table 3.

Table 3: Adverse Events Following Foam Sclerotherapy

Adverse Event	Frequency	Percentage
Pain at Injection Site	12	12%
Temporary Bleeding	8	8%
Infection	2	2%
Thrombosis	1	1%
No Adverse Events	77	77%

The majority of patients (77%) experienced no adverse events following foam sclerotherapy. The most common adverse event was mild pain at the injection site (12%), followed by temporary bleeding (8%). Serious adverse events like thrombosis were rare (1%).

Patient Satisfaction

Patient satisfaction was assessed using a standardized questionnaire post-treatment. Table 4 summarizes the satisfaction levels of the participants.

Table 4: Patient Satisfaction with Foam Sclerotherapy Treatment (n=100)

Satisfaction Parameter	Frequency	Percentage
Overall Satisfaction		
Very Satisfied	55	55%

Satisfied	35	35%
Neutral	7	7%
Dissatisfied	3	3%
Ease of Procedure		
Very Easy	50	50%
Easy	40	40%
Neutral	5	5%
Difficult	5	5%
Post-Treatment Recovery		
Fast Recovery	60	60%
Moderate Recovery	30	30%
Slow Recovery	10	10%

The majority of patients (90%) were satisfied or very satisfied with the overall treatment. Half of the patients found the procedure to be very easy (50%), and 60% experienced fast recovery post-treatment. Only 10% reported slow recovery, indicating the generally positive response to foam sclerotherapy.

Statistical Analysis of Outcomes

Descriptive and inferential statistical methods were employed to analyze the clinical outcomes and patient satisfaction. Paired t-tests were used to compare pre- and post-treatment clinical symptoms, and the results showed statistically significant improvement ($p < 0.05$) in all areas (bleeding, prolapse, pain, and overall improvement). Chi-square tests were used to analyze categorical data, such as adverse events and satisfaction levels, with no significant differences observed between the two treatment groups.



Table 5: Statistical Analysis of Pre- and Post-Treatment Clinical Symptoms

Clinical Symptom	Pre-Treatment Mean	Post-Treatment Mean	p-value
Bleeding	3.5	0.5	0.001
Prolapse	3.2	0.3	0.001
Pain	3.6	0.4	0.001
Overall Improvement	2.5	4.7	0.001

The significant reduction in the mean scores for bleeding, prolapse, and pain post-treatment further supports the clinical efficacy of foam sclerotherapy.

Discussion

The study on foam sclerotherapy for the treatment of hemorrhoids involved 100 patients at the and demonstrated promising clinical outcomes. Participants were primarily aged between 31 and 50 years, with a higher proportion of males (60%). Most patients had grade II hemorrhoids (70%), while 30% had grade III hemorrhoids.

Clinical assessments showed significant improvements post-treatment. The incidence of bleeding, prolapse, and pain was substantially reduced. Specifically, bleeding decreased from 85% to 20%, prolapse from 70% to 10%, and pain from 80% to 15%. Additionally, 95% of the participants reported an overall improvement in their condition, highlighting the efficacy of foam sclerotherapy as a treatment option for hemorrhoids. These findings indicate that foam sclerotherapy can effectively manage the symptoms associated with hemorrhoids, offering significant relief to patients.

Adverse events were infrequent, with only 12% of patients reporting mild pain at the injection site and 8% experiencing temporary bleeding. Serious complications were rare, with thrombosis occurring in just 1% of patients. This low incidence of adverse events supports the safety of foam sclerotherapy as a minimally invasive procedure.

Patient satisfaction was overwhelmingly positive, with 90% of participants expressing satisfaction with the

procedure. Most patients found the procedure easy and reported fast recovery. Only 10% experienced slow recovery, but the overall feedback was strongly favorable, emphasizing the procedure's convenience and effectiveness.

Statistical analysis confirmed the clinical improvements, with paired t-tests revealing significant reductions in clinical symptoms ($p < 0.05$). The analysis also showed a high level of agreement between pre- and post-treatment assessments, reinforcing the validity of the findings.

One study analyzed the clinical outcomes of foam sclerotherapy in patients with symptomatic hemorrhoids. The results demonstrated that foam sclerotherapy provided significant improvement in symptoms, with a marked reduction in bleeding, pain, and prolapse, and a high rate of complete symptom resolution. Patients reported minimal discomfort, and the treatment was well-received, leading to improved overall satisfaction compared to other minimally invasive procedures. The study concluded that foam sclerotherapy is an effective, safe, and minimally invasive treatment option for hemorrhoids, with long-term outcomes suggesting a low recurrence rate [8]. In another study, the efficacy of foam sclerotherapy was compared with traditional surgical methods, such as hemorrhoidectomy. The results indicated that foam sclerotherapy achieved similar clinical success in terms of symptom resolution but with fewer side effects, lower complication rates, and reduced recovery times. Furthermore, patients undergoing foam sclerotherapy were more satisfied with the non-invasive nature of the procedure and its rapid recovery time, indicating a preference for foam sclerotherapy in outpatient settings [9]. A third study focused specifically on patient satisfaction and the subjective outcomes of foam sclerotherapy in the treatment of hemorrhoids. This research highlighted the high levels of patient satisfaction, particularly regarding the minimal postoperative discomfort, quick recovery time, and the convenience of performing the procedure in an outpatient setting. Most patients reported that they would choose foam sclerotherapy again if needed, citing its efficacy, simplicity, and reduced hospital stay [10].

Another study assessed the safety and long-term efficacy of foam sclerotherapy, reporting a high rate of initial symptom relief and minimal adverse effects. The follow-up data showed that a significant percentage of patients



remained symptom-free for extended periods, with only a small fraction experiencing recurrence. This suggests that foam sclerotherapy is not only effective in the short term but also provides lasting benefits for many patients [11]. A recent study examined the feasibility and effectiveness of performing foam sclerotherapy in outpatient clinics. The findings highlighted that foam sclerotherapy could be effectively administered in a non-hospital setting, with high patient satisfaction rates due to its simplicity and the low likelihood of complications. This study emphasized the procedure's potential for reducing healthcare costs while maintaining high-quality outcomes [12].

Conclusion

This study confirms that foam sclerotherapy is an effective and safe treatment for hemorrhoids, providing significant relief from symptoms like bleeding, prolapse, and pain. The procedure was well-tolerated, with minimal adverse events and quick recovery. High patient satisfaction and positive clinical outcomes support foam sclerotherapy as a viable alternative to traditional surgical treatments for haemorrhoids.

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