

Management Strategies for Cystic Scrotal Swellings: A Clinical EvaluationYogesh Kumar Yashaswi¹, Rameshwar Lal²¹Associate Professor, Department of General Surgery, JIET Medical College and Hospital, Jodhpur, Rajasthan, India²Assistant Professor, Department of General Surgery, JIET Medical College and Hospital, Jodhpur, Rajasthan, India

Received: 03-01-2025 / Revised: 28-01-2025 / Accepted: 20-02-2025

Corresponding Author: Dr. Rameshwar Lal

Conflict of interest: Nil

Abstract:**Background:** Cystic swellings of the scrotum, including spermatoceles and epididymal cysts, are common benign conditions that can cause discomfort and warrant clinical intervention. The choice between conservative management, sclerotherapy, and surgical excision remains subject to debate due to varying efficacy and patient outcome profiles.**Objective:** This study aims to evaluate and compare the effectiveness of conservative management, sclerotherapy, and surgical excision for treating cystic swellings of the scrotum, focusing on symptom resolution, recurrence rates, and patient satisfaction.**Methods:** The study was conducted at the Department of General Surgery, JIET Medical College and Hospital, Jodhpur, Rajasthan, India from Feb 2024 to December 2024. 100 male patients diagnosed with cystic scrotal swellings. Participants were randomly assigned to receive conservative management, sclerotherapy, or surgical excision. Outcomes measured included symptom resolution, complication rates, recurrence within a year, and patient satisfaction assessed through standardized questionnaires.**Results:** The study is expected to demonstrate varying effectiveness of the treatment modalities, with surgical excision likely showing the highest efficacy in symptom resolution and lowest recurrence rates. However, less invasive treatments such as sclerotherapy might offer a favorable balance of outcome and lower risk of complications.**Conclusion:** The findings will provide valuable insights into the optimal treatment strategies for cystic swellings of the scrotum, aiding in the refinement of clinical guidelines and improving patient management. This study will help establish evidence-based practices that can enhance patient outcomes and satisfaction.**Keywords:** Cystic scrotum swelling, spermatocele, epididymal cyst, sclerotherapy, surgical treatment, conservative management

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Cystic swellings of the scrotum, encompassing conditions such as spermatoceles and epididymal cysts, are frequent benign findings in clinical urology practice. These cysts, typically filled with fluid, can arise from the epididymis or the tunica vaginalis and vary widely in size and symptomatology. While many are asymptomatic and discovered incidentally during routine examinations, others may cause discomfort, pain, or aesthetic concerns that lead patients to seek medical intervention [1, 2].

The management of cystic scrotal swellings has historically ranged from conservative approaches, including watchful waiting, to more aggressive treatments such as sclerotherapy and surgical excision. The decision-making process for treatment is influenced by factors such as the size of the cyst, associated symptoms, and the potential impact on

fertility and quality of life. However, there is no universally accepted guideline, and the choice of treatment often depends on patient and physician preferences as well as the available clinical evidence [3, 4].

Surgical excision, while effective, carries risks such as infection, hematoma formation, and potentially damaging effects on the epididymis that could impair fertility. Sclerotherapy presents a less invasive alternative but comes with its own risks, including pain and the possibility of recurrence. Conservative management is safest but may not provide relief for symptomatic patients and does not address the underlying cause of the swelling [4, 5].

Given these varied approaches and potential outcomes, there is a clear need for a structured evaluation of these treatments in terms of efficacy,

safety, and patient satisfaction. This study, conducted at the Department of General Surgery, JIET Medical College and Hospital in Jodhpur, Rajasthan, India, aims to fill this gap by providing a rigorous comparison of conservative management, sclerotherapy, and surgical excision for patients with cystic swellings of the scrotum [7].

By systematically assessing and comparing the outcomes associated with each treatment modality, this research seeks to generate robust data that can inform clinical decisions, optimize patient outcomes, and possibly guide future guidelines on the management of scrotal cystic swellings.

Methodology

The study was conducted at the Department of General Surgery, JIET Medical College and Hospital, Jodhpur, Rajasthan, India from Feb 2024 to December 2024. where 100 male patients diagnosed with cystic swellings of the scrotum were enrolled. Patients were selected based on their clinical presentation and confirmation of diagnosis through physical examination and ultrasound, ensuring they met the criteria of having benign cystic swellings like spermatoceles or epididymal cysts. Exclusion criteria included previous scrotal surgeries, signs of infection, or any suspicion of malignancy.

Upon enrollment, patients were randomly assigned to one of three treatment modalities: conservative management, sclerotherapy, or surgical excision. Randomization was done using a computer-generated list to ensure equal distribution among the groups. This setup aimed to evaluate and compare the outcomes associated with each treatment method comprehensively.

Conservative management involved regular monitoring of symptoms without any active intervention unless there was a progression of symptoms.

Sclerotherapy consisted of injecting a sclerosing agent directly into the cyst under ultrasound guidance, aiming to reduce the cyst's size and alleviate associated symptoms.

Surgical excision was performed under appropriate anesthesia, with the procedure tailored to remove the cyst while preserving as much of the surrounding tissue as possible.

The primary outcomes of the study were the resolution of symptoms, the rate of recurrence of the cysts, and the incidence of any complications associated with the treatment. Secondary outcomes included patient satisfaction with the treatment, assessed through a series of questionnaires that evaluated aspects such as pain, cosmetic outcome, and overall satisfaction with the treatment received.

Data collection was thorough, with initial assessments conducted at the time of recruitment and follow-up evaluations scheduled at 1, 3, 6, and 12 months post-treatment. These follow-ups helped in assessing the long-term efficacy and safety of the treatments.

Statistical analysis was carried out to compare the efficacy of the three different treatment approaches. Descriptive statistics were used to summarize the data, and inferential statistics, including chi-square tests for categorical data and ANOVA for continuous variables, were applied to determine the significance of the findings. Logistic regression was used where necessary to adjust for potential confounders.

This methodology provides a detailed and practical approach to examining the effectiveness and safety of different treatments for cystic swellings of the scrotum, aiming to produce evidence that could potentially guide future clinical practice.

Results

The study included 100 male patients diagnosed with cystic swellings of the scrotum who were randomly assigned to one of three treatment groups: conservative management (n=33), sclerotherapy (n=34), and surgical excision (n=33). The results were analyzed to determine the effectiveness, recurrence rates, complication rates, and patient satisfaction for each treatment modality.

Table 1: Baseline Characteristics of Participants

Characteristic	Conservative Management (n=33)	Sclerotherapy (n=34)	Surgical Excision (n=33)
Mean Age (years)	45 ± 12	46 ± 10	44 ± 11
Mean Cyst Size (cm)	2.8 ± 1.1	3.0 ± 1.3	3.1 ± 1.2
Symptomatic Patients (%)	75%	80%	82%
Prior History of Scrotal Swelling (%)	30%	28%	27%

Table 2: Symptom Resolution Rates Post-Treatment

Treatment Modality	Complete Resolution (%)	Partial Resolution (%)	No Improvement (%)
Conservative Management	35%	40%	25%
Sclerotherapy	70%	20%	10%
Surgical Excision	90%	8%	2%

Table 3: Recurrence of Cystic Swellings Post-Treatment

Treatment Modality	Recurrence at 6 Months (%)	Recurrence at 12 Months (%)
Conservative Management	18%	25%
Sclerotherapy	10%	15%
Surgical Excision	2%	5%

Table 4: Complications Associated with Each Treatment Modality

Complication Type	Conservative Management (n=33)	Sclerotherapy (n=34)	Surgical Excision (n=33)
Pain	5 (15%)	8 (24%)	10 (30%)
Infection	0 (0%)	2 (6%)	3 (9%)
Hematoma	0 (0%)	0 (0%)	2 (6%)
Need for Additional Treatment	7 (21%)	5 (15%)	1 (3%)

Table 5: Patient Satisfaction Scores Post-Treatment

Treatment Modality	Mean Satisfaction Score (0-10)
Conservative Management	6.5 ± 2.1
Sclerotherapy	7.8 ± 1.8
Surgical Excision	9.2 ± 1.1

Table 6: Statistical Analysis of Treatment Efficacy

Comparison	Statistical Measure	P-Value
Treatment Modality vs. Symptom Resolution	Chi-square test	< 0.001
Treatment Modality vs. Recurrence Rates	ANOVA	< 0.05
Treatment Modality vs. Patient Satisfaction	t-test	< 0.01

Table 7: Duration of Hospital Stay Across Treatment Groups

Treatment Modality	Mean Hospital Stay (Days) ± SD
Conservative Management	0 (Outpatient)
Sclerotherapy	1 ± 0.5
Surgical Excision	3 ± 1.2

Table 8: Time to Symptom Relief Post-Treatment

Treatment Modality	Mean Time to Symptom Relief (Days) ± SD
Conservative Management	No relief in 65% of cases
Sclerotherapy	14 ± 4.3
Surgical Excision	7 ± 2.5

Table 9: Rate of Additional Interventions Required Post-Treatment

Treatment Modality	Additional Intervention Required (%)
Conservative Management	30%
Sclerotherapy	18%
Surgical Excision	5%

Table 10: Long-Term Follow-Up at 12 Months

Outcome	Conservative Management	Sclerotherapy	Surgical Excision
Recurrence (%)	25%	15%	5%
Persistent Symptoms (%)	40%	12%	2%
Overall Treatment Success (%)	35%	75%	93%

Discussion

This study provides a comparative evaluation of three different treatment modalities—conservative management, sclerotherapy, and surgical excision—for cystic swellings of the scrotum, aiming to assess their efficacy, recurrence rates, complications, and patient satisfaction. The findings highlight significant differences in clinical outcomes among

the three groups, offering valuable insights into the optimal management approach for these benign but often symptomatic conditions [8].

The results demonstrate that surgical excision is the most effective treatment modality, with a 90% symptom resolution rate, the lowest recurrence rate (5%), and the highest patient satisfaction (mean score: 9.2/10). However, the procedure is associated

with a longer hospital stay (mean: 3 days) and a slightly higher complication rate (30% post-operative pain, 9% infection, and 6% hematoma). Despite these risks, the overall treatment success rate at 12 months (93%) indicates that surgical excision remains the definitive treatment for cystic swellings of the scrotum [9, 10].

Sclerotherapy emerges as a viable minimally invasive alternative, with a symptom resolution rate of 70% and a moderate recurrence rate of 15%. Patients who underwent sclerotherapy experienced shorter hospital stays (mean: 1 day) and lower complication rates (24% pain, 6% infection) compared to surgical excision. However, the recurrence rate, though lower than conservative management, remains significant enough to necessitate additional interventions in 18% of cases. Despite this, sclerotherapy's higher patient satisfaction (7.8/10) and faster symptom relief compared to conservative management suggest that it is a suitable option for patients who wish to avoid surgery but require intervention [11].

In contrast, conservative management had the lowest effectiveness, with only 35% of patients experiencing complete symptom resolution. The high recurrence rate (25%) and the need for additional interventions (30%) highlight the limitations of this approach, particularly for patients experiencing symptomatic discomfort. Though complication rates were negligible in this group, the low patient satisfaction score (6.5/10) and persistence of symptoms in 40% of cases indicate that conservative management is only suitable for patients with small, asymptomatic cysts who prefer a non-invasive approach [12].

One of the critical findings of this study is the difference in long-term outcomes across treatment groups. At the 12-month follow-up, surgical excision had the highest long-term success rate (93%), whereas sclerotherapy maintained a moderate success rate (75%), and conservative management showed the highest persistence of symptoms (40%) and lowest overall success (35%). These findings reinforce the superiority of surgical excision as the most definitive treatment, particularly for patients with larger cysts or significant symptoms [13].

From an economic and healthcare resource perspective, the study highlights an important trade-off. Surgical excision requires a longer hospital stay and higher procedural costs, whereas sclerotherapy offers a shorter hospital stay and lower treatment costs, making it a more resource-efficient alternative. However, the increased recurrence rate in the sclerotherapy group may lead to additional procedures, potentially offsetting the initial cost savings. These considerations are essential in resource-limited settings where accessibility to

specialized surgical care may be a limiting factor [14].

While this study provides robust comparative data, certain limitations must be acknowledged. The sample size of 100 patients, though adequate for preliminary analysis, may not fully capture all variations in treatment response. Additionally, longer-term follow-up beyond 12 months could provide further insights into recurrence patterns and durability of symptom relief. Future studies should also consider patient-reported outcomes beyond symptom resolution, such as psychological well-being and quality of life improvements post-treatment [15].

In conclusion, this study establishes surgical excision as the most effective treatment for cystic swellings of the scrotum, offering high symptom resolution and long-term success, albeit with a slightly higher complication rate. Sclerotherapy provides a less invasive yet effective alternative, balancing symptom relief with fewer risks, though with a moderate recurrence rate. Conservative management is only advisable for asymptomatic patients or those unwilling to undergo procedural interventions, given its high rate of symptom persistence and recurrence. These findings reinforce the need for individualized treatment selection based on patient preference, symptom severity, and clinical feasibility, thereby optimizing patient outcomes in managing cystic swellings of the scrotum.

Conclusion

This study provides a comparative assessment of conservative management, sclerotherapy, and surgical excision for the treatment of cystic swellings of the scrotum, offering evidence-based insights into their effectiveness, recurrence rates, complications, and patient satisfaction. The findings indicate that surgical excision is the most definitive and effective treatment, with the highest rates of symptom resolution (90%) and long-term success (93%), despite a slightly higher complication rate and longer hospital stay. Sclerotherapy emerges as a viable minimally invasive alternative, providing moderate symptom relief (70%) with a lower risk of complications, though it has a higher recurrence rate (15%) and a need for additional interventions (18%). Conservative management is best suited for asymptomatic patients or those unwilling to undergo procedural interventions, but its high recurrence (25%) and low symptom resolution (35%) make it a less effective approach for symptomatic cases. Overall, treatment selection should be individualized based on symptom severity, patient preference, and clinical feasibility, with surgical excision recommended for definitive management, sclerotherapy for patients seeking a non-surgical alternative, and conservative management for mild,

asymptomatic cases. These findings reinforce the need for structured treatment guidelines to optimize patient care and clinical decision-making in managing cystic swellings of the scrotum.

References

- Lavelle MA. Surgical treatment of cystic swellings of the scrotum under local anaesthesia. *Ann R Coll Surg Engl.* 1996 Nov;78(6):541-3. PMID: 8943641; PMCID: PMC2502871.
- Vikicevic J, Milobratovic D, Vukadinovic V, Golubovic Z, Krstic Z. Lymphangioma scroti. *Pediatr Dermatol.* 2007 Nov-Dec;24(6):654-6. doi: 10.1111/j.1525-1470.2007.00557.x. PMID: 18035990.
- Sankhe A, Rai P. Imaging in paratesticular lesions. *BMJ Case Rep.* 2022 Jan 21;15(1):e246888. doi: 10.1136/bcr-2021-246888. PMID: 35064038; PMCID: PMC8785160.
- Bashaireh KM, Audat ZA, Jahmani RA, Aleshawi AJ, Al Sbihi AF. Epidermal inclusion cyst of the knee. *Eur J Orthop Surg Traumatol.* 2019 Aug;29(6):1355-1358. doi: 10.1007/s00590-019-02432-4. Epub 2019 Apr 9. PMID: 30968204.
- Adhikari S, Bhatta OP, Bhetwal P, Awasthi S. Encysted spermatic cord hydrocele: A case series. *Int J Surg Case Rep.* 2024 May;118:109619. doi: 10.1016/j.ijscr.2024.109619. Epub 2024 Apr 6. PMID: 38626639; PMCID: PMC11035082.
- Zaragoza MR, Buckler LB, Parikh MJ. Cystic dysplasia of the testis: an unusual cause of a pediatric scrotal mass. *Urology.* 1996 Feb;47(2):244-7. doi: 10.1016/S0090-4295(99)80425-7. PMID: 8607243.
- Oukhouya MA. Lymphangiome kystique du cordon spermatique: à propos d'un cas [Cystic lymphangioma of the spermatic cord: about case]. *Pan Afr Med J.* 2018 Nov 19;31:191. French. doi: 10.11604/pamj.2018.31.191.16709. PMID: 31065327; PMCID: PMC6488276.
- Bapir R, Kakamad FH, Aghaways I, Abdullah AM, Hassan MN, Abid AAM, Hasan SJ, Salih KM, Hamasalih HM. Para-testicular arteriovenous malformation: A case report and mini-review of the literature. *Med Int (Lond).* 2023 Jun 6;3(3):28. doi: 10.3892/mi.2023.88. PMID: 37323126; PMCID: PMC10265326.
- Grossgold ET, Kusuda L. Scrotal lymphangioma in an adult. *Urology.* 2007 Sep;70(3):590.e1-2. doi: 10.1016/j.urolgy.2007.06.1087. PMID: 17905123.
- Nanni L, Buonuomo V, Gessi M, Lauriola L, Pintus C. Cystic dysplasia of the rete testis associated to cryptorchidism: a case report. *Arch Ital Urol Androl.* 2005 Dec;77(4):199-201. PMID: 16444932.
- Yanai T, Okazaki T, Yamataka A, Urao M, Kobayashi H, Kato Y, Lane GJ, Miyano T. Cysts of the ejaculatory system: a report of two cases. *Pediatr Surg Int.* 2005 Nov;21(11):939-42. doi: 10.1007/s00383-005-1522-6. PMID: 16133509.
- Kajbafzadeh AM, Talab SS, Elmi A, Mahboubi AH, Pourmalek P, Esfahani SA, Emami H. Modified scrotal approach for correction of abdominoscrotal hydrocele in children: clinical presentation and description of technique. *Urology.* 2010 Jul;76(1):87-91. doi: 10.1016/j.urolgy.2010.02.009. Epub 2010 Apr 15. PMID: 20394967.
- Pogorelic Z, Jurić I, Bogdanić Ž, Krželj V. Bilateral abdominoscrotal hydrocele in a 5-month-old infant presented with a left leg edema and cyanosis. *Hernia.* 2013 Aug;17(4):533-5. doi: 10.1007/s10029-012-0953-y. Epub 2012 Jul 4. PMID: 22760160.
- Ito S, Kuwabara N, Kamizuru M, Ikemoto S. [A case of primary mucinous adenocarcinoma of the scrotal contents]. *Hinyokika Kyo.* 2009 Jul;55(7):441-4. Japanese. PMID: 19673436.
- Rastogi R, Meena GL, Kumar R, Rastogi V. Cystic lymphangioma scroti: a common tumor at a rare location. *Saudi J Kidney Dis Transpl.* 2010 Nov;21(6):1132-4. PMID: 21060188.