

ORIGINAL RESEARCH

To study the Clinical Evaluation and Management of Cystic Scrotal Swellings

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ABSTRACT

Aim: This study aimed to evaluate the clinical characteristics, treatment outcomes, and patient satisfaction following surgical interventions for cystic swellings of the scrotum, including hydroceles, epididymal cysts, and spermatoceles. **Materials and Methods:** The study was conducted during January 2022 to July 2022 at Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India. A prospective observational clinical study was conducted in 200 male patients with cystic swellings of the scrotum. Patients underwent clinical examination, ultrasonography, and routine laboratory investigations. Surgical treatments, including hydrocelectomy and cyst excision, were performed, followed by postoperative monitoring for complications and patient satisfaction, assessed at 6-month follow-up. **Results:** Hydrocele was the most common type of swelling, observed in 60% of cases, followed by epididymal cysts (30%) and spermatoceles (10%). Scrotal pain (70%) and swelling (90%) were the most frequently reported symptoms. Postoperatively, 85% of patients experienced no complications, with scrotal edema (6%), infection (5%), and hematoma (4%) being the most common complications. Patient satisfaction was high, with 75% of patients being very satisfied with the outcome of their surgery. **Conclusion:** Surgical interventions for cystic swellings of the scrotum, particularly hydrocelectomy and cyst excision, are effective with minimal complications. Early diagnosis and appropriate treatment improve patient outcomes and quality of life, as evidenced by the high rate of patient satisfaction.

Keywords: Cystic swelling, hydrocele, epididymal cyst, scrotum surgery, postoperative outcomes.

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INTRODUCTION

Cystic swellings of the scrotum are a common clinical condition that can cause significant discomfort and anxiety in patients. The scrotum, a sac of skin that houses the testes and associated structures, can develop various types of cysts, including hydroceles, epididymal cysts, and spermatoceles. While these swellings are often benign and slow-growing, they can present with symptoms that affect the quality of life, including pain, discomfort, and visible enlargement of the scrotum. The treatment of cystic swellings depends on the type, size, and symptoms, ranging from conservative management to surgical intervention.^[1] Hydrocele is the most common form of cystic swelling in the scrotum, characterized by an accumulation of fluid in the tunica vaginalis, the membrane surrounding the testicles. This fluid buildup can result from congenital defects, infections, trauma, or idiopathic causes. In newborns, hydroceles are often congenital and may resolve spontaneously, while in adults, they typically develop over time due to inflammation or injury. Hydroceles may be

asymptomatic or present with noticeable swelling and discomfort, particularly as they increase in size. In severe cases, hydroceles can cause difficulty in walking or performing daily activities due to the heaviness and bulk of the scrotum.^[2] Epididymal cysts, another type of scrotal swelling, arise from the epididymis, the coiled tube located at the back of the testicle that stores and carries sperm. These cysts are typically benign and filled with clear fluid, although they can sometimes be associated with inflammation or infections. Epididymal cysts may go unnoticed for long periods if they are small and asymptomatic, but as they grow, they can lead to scrotal pain, discomfort, and palpable masses. Although these cysts are generally harmless, larger ones may require surgical excision, especially if they cause persistent symptoms.^[3] Spermatoceles, also known as spermatic cysts, are fluid-filled cysts that form in the epididymis and contain sperm. Like epididymal cysts, spermatoceles are usually small and asymptomatic, but they can grow over time and cause discomfort or pain. Spermatoceles are often discovered incidentally

during physical exams or imaging studies and may not require treatment unless they become symptomatic or large enough to cause concern. In cases where spermatoceles cause pain or interfere with daily activities, surgical removal may be indicated.^[4]

The diagnosis of cystic swellings of the scrotum typically begins with a thorough clinical examination, which includes a detailed history and physical assessment of the scrotal contents. Palpation of the scrotum can help identify the presence of cystic masses, determine their size and consistency, and assess for tenderness or other signs of inflammation. Additional diagnostic tests, such as ultrasound, are often used to confirm the nature of the swelling and to differentiate between various types of cysts. Ultrasound is particularly useful in distinguishing between solid and fluid-filled masses and in evaluating the extent of the cystic swelling.

^[5]Treatment options for cystic swellings of the scrotum vary depending on the type and severity of the condition. For asymptomatic or mildly symptomatic cases, conservative management may be appropriate, involving observation and regular follow-up to monitor for changes in size or symptoms. However, for patients experiencing significant discomfort, pain, or cosmetic concerns, surgical intervention is often recommended. The most common surgical procedure for hydrocele is hydrocelectomy, a simple operation to remove the fluid-filled sac. In cases of epididymal cysts or spermatoceles, excision of the cyst is performed to relieve symptoms and prevent recurrence.^[6]While surgical treatment is generally safe and effective, potential complications can arise, including infection, scrotal edema, hematoma, and recurrence of the cyst. Postoperative care is essential to ensure proper healing and to minimize the risk of complications. Most patients experience significant relief of symptoms following surgery and report high levels of satisfaction with the outcomes. The management of cystic swellings of the scrotum continues to evolve with advancements in surgical techniques and diagnostic tools. Understanding the underlying causes, clinical presentation, and treatment options for these swellings is crucial in providing optimal care for patients. This clinical study aims to evaluate the treatment outcomes, postoperative complications, and patient satisfaction in a cohort of patients with cystic scrotal swellings, providing insights into the most effective management strategies for this common urological condition. By analyzing the clinical characteristics and surgical outcomes, this study seeks to contribute to the growing body of knowledge on the treatment of cystic swellings in the scrotum and to improve the quality of care for affected individuals.^[7]

MATERIALS AND METHODS

The study was conducted during January 2022 to July 2022 at Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India. This prospective

observational clinical study was conducted to evaluate the treatment outcomes of cystic swelling of the scrotum in 200 patients. The study was carried out in the Department of General Surgery. Ethical approval for the study was obtained from the institutional review board, and informed consent was obtained from all participants. A total of 200 male patients, aged 18 years and older, presenting with cystic swellings of the scrotum were included in the study. The types of swellings evaluated in the study included hydrocele, epididymal cysts, and spermatocele. The inclusion criteria were males aged 18 years or older, with cystic swellings confirmed by both clinical examination and ultrasonography, and patients willing to provide informed consent. Exclusion criteria for the study included patients diagnosed with testicular tumors or malignancy, patients with acute infections or active sexually transmitted infections (STIs), and those who had undergone scrotal surgery within the past 12 months. Each patient underwent a comprehensive clinical evaluation, which began with a detailed medical history documenting chief complaints, the duration of symptoms, past medical history, and any relevant family or personal history. This was followed by a thorough physical examination of the scrotum, with findings recorded using a standardized proforma. To confirm the diagnosis and assess the extent of the cystic swelling, diagnostic ultrasonography of the scrotum was performed for all patients. Additionally, routine blood tests, including a complete blood count (CBC), renal function tests (RFT), liver function tests (LFT), and screening for sexually transmitted infections, were conducted as part of the preoperative assessment.

Methodology

The treatment approach for the cystic swelling varied depending on the specific diagnosis. For patients diagnosed with hydrocele, the procedure performed was an open surgical hydrocelectomy, commonly referred to as Jaboulay's procedure, which involved excision of the tunica vaginalis. For patients with epididymal cysts or spermatoceles, surgical excision of the cyst was carried out while carefully preserving the surrounding scrotal structures. All surgical procedures were conducted under spinal or general anesthesia, depending on the patient's preference and the surgeon's recommendation. Standard surgical techniques were employed, ensuring aseptic conditions, and the incision in the scrotum was closed with absorbable sutures. Hemostasis was carefully maintained during surgery, and a sterile dressing was applied postoperatively. Scrotal support was provided immediately after the procedure to promote healing and reduce discomfort. Postoperative care involved regular monitoring, including routine dressing changes and pain management. Patients were prescribed antibiotics and anti-inflammatory medications following surgery as per standard postoperative care protocols. The length of hospital

stay varied based on individual recovery, with most patients discharged within 24 to 48 hours post-surgery. Follow-up visits were scheduled at 1 week, 1 month, 3 months, and 6 months after surgery to monitor for complications such as infection, hematoma, or scrotal edema, and to assess overall healing. During these follow-up visits, the recurrence of swelling and any other complications were evaluated through both clinical examination and ultrasonography. The primary outcomes of this study were categorized into three main areas. First, the resolution of cystic swellings, which was assessed at each follow-up visit through clinical examination and ultrasonography to confirm the absence of recurrent swelling. Second, the study evaluated the occurrence of complications, which included wound infections, hematoma formation, recurrence of the swelling, and persistent scrotal pain. Lastly, patient satisfaction was assessed at the 6-month follow-up using a standardized questionnaire, focusing on the patient's experience with the treatment and overall satisfaction with the outcomes.

Data Analysis

Data were collected and entered into a computerized database for analysis. Descriptive statistics were used to summarize patient demographics, clinical characteristics, and outcomes. Categorical data were expressed as frequencies and percentages. Continuous data were expressed as means \pm standard deviations. The relationship between different variables and outcomes was analyzed using chi-square tests for categorical data and t-tests for continuous data. A p-value of <0.05 was considered statistically significant. Statistical analysis was performed using SPSS version 25.0.

RESULTS

Table 1: Age Distribution of Patients

The age distribution of the 200 patients in the study shows that the highest percentage of patients with cystic swelling of the scrotum fell within the 41-50 years age group (27.5%), followed by those in the 31-40 years age group (22.5%). Patients in the 51-60 years age range comprised 20% of the population. Meanwhile, younger patients aged 18-30 years represented 17.5% of the total, and the lowest percentage of cases was seen in patients above 60 years old, accounting for 12.5%. This distribution suggests that cystic swellings of the scrotum are more common in middle-aged individuals, with a gradual decline in older age groups. The lower occurrence in the youngest group could be due to the fact that cystic swellings such as hydroceles, epididymal cysts, and spermatoceles often develop over time due to factors like trauma, infections, or degenerative changes.

Table 2: Symptoms Reported by Patients

The most frequently reported symptom among the patients was scrotal swelling, with 90% of the patients presenting this issue. Scrotal pain was also common,

affecting 70% of the patients, which indicates that many of the cystic swellings were symptomatic and potentially causing discomfort. Heaviness in the scrotum was noted in 60% of cases, further reflecting the physical burden caused by cystic masses. Discomfort while walking, likely related to the size and weight of the scrotal swelling, was reported by half of the patients (50%). Fever, which could indicate infection or an inflammatory response, was present in 15% of cases. These symptoms suggest that while cystic swellings are generally slow-growing and benign, they can cause significant physical discomfort and interfere with daily activities.

Table 3: Types of Cystic Swelling and Clinical Parameters

The most common type of cystic swelling observed in the study was hydrocele, accounting for 60% of cases. Epididymal cysts were seen in 30% of patients, while spermatoceles were present in 10% of the cases. Hydroceles tend to be more prevalent due to the accumulation of fluid in the scrotal sac, often associated with conditions such as trauma, infections, or congenital defects. The clinical parameters show that 55% of patients had tenderness on palpation, indicating inflammation or pressure due to the swelling. Visible scrotal swelling was present in 90% of cases, consistent with the primary complaint of scrotal enlargement. Fluctuation, a sign of fluid-filled cysts, was positive in 70% of patients, while transillumination, another diagnostic sign for fluid-filled masses like hydroceles, was positive in 65% of cases. These clinical findings align with the diagnosis of fluid-filled cystic swellings such as hydroceles and epididymal cysts.

Table 4: Laboratory and Ultrasound Findings

Laboratory findings revealed that only 10% of patients had elevated white blood cells (WBCs), suggesting that infection was not a significant contributing factor in most cases. All patients had normal renal and liver function tests, ruling out systemic causes of scrotal swelling. On ultrasound examination, 60% of the cases were confirmed to be hydroceles, 30% were diagnosed as epididymal cysts, and 10% were identified as spermatoceles. Ultrasound, being a non-invasive and accurate diagnostic tool, was crucial in differentiating between types of cystic swellings and confirming the fluid-filled nature of the masses.

Table 5: Surgical Procedures and Intraoperative Findings

The most common surgical procedure performed was open hydrocelectomy, which was carried out in 60% of the patients. Cyst excision was performed in 40% of cases, typically for those diagnosed with epididymal cysts or spermatoceles. Intraoperative findings revealed that fluid aspiration was performed in 55% of cases, which is consistent with the treatment of hydroceles where excess fluid is drained. Adhesions were found in 25% of patients, indicating a history of chronic or recurrent inflammation.

Fortunately, no intraoperative complications occurred in 90% of the cases, reflecting the safety of the procedures performed.

Table 6: Postoperative Complications and Patient Satisfaction at 6 Months

Postoperative complications were minimal, with 85% of patients experiencing no complications. The most common complication was scrotal edema, which occurred in 6% of patients. Infection was seen in 5% of cases, and hematoma was noted in 4% of patients. These complications are relatively common in

surgeries involving the scrotum but were well-managed in most cases. Patient satisfaction at the 6-month follow-up showed that 75% of patients were very satisfied with the outcome of their treatment, 15% were satisfied, 5% were neutral, and another 5% were dissatisfied. The high level of satisfaction indicates that surgical interventions for cystic swelling of the scrotum are effective in relieving symptoms and improving the quality of life for the majority of patients.

Table 1: Age Distribution of Patients

Age Group (Years)	Number of Patients	Percentage (%)
18-30	35	17.5
31-40	45	22.5
41-50	55	27.5
51-60	40	20.0
Above 60	25	12.5

Table 2: Symptoms Reported by Patients

Symptom	Number of Patients	Percentage (%)
Scrotal Swelling	180	90.0
Scrotal Pain	140	70.0
Heaviness in Scrotum	120	60.0
Discomfort while Walking	100	50.0
Fever	30	15.0

Table 3: Types of Cystic Swelling and Clinical Parameters

Type of Swelling	Number of Patients	Percentage (%)
Hydrocele	120	60.0
Epididymal Cyst	60	30.0
Spermatocele	20	10.0
Clinical Parameter		
Tenderness on Palpation	110	55.0
Visible Scrotal Swelling	180	90.0
Fluctuation Test Positive	140	70.0
Transillumination Positive	130	65.0

Table 4: Laboratory and Ultrasound Findings

Finding	Number of Patients	Percentage (%)
Elevated White Blood Cells (CBC)	20	10.0
Normal Renal Function Tests	200	100.0
Normal Liver Function Tests	200	100.0
Hydrocele on Ultrasound	120	60.0
Epididymal Cyst on Ultrasound	60	30.0
Spermatocele on Ultrasound	20	10.0

Table 5: Surgical Procedures and Intraoperative Findings

Surgical Procedure	Number of Patients	Percentage (%)
Open Hydrocelectomy	120	60.0
Cyst Excision	80	40.0
Intraoperative Fluid Aspiration	110	55.0
Intraoperative Adhesions Found	50	25.0
No Intraoperative Complications	180	90.0

Table 6: Postoperative Complications and Patient Satisfaction at 6 Months

Complications	Number of Patients	Percentage (%)
Infection	10	5.0
Hematoma	8	4.0
Scrotal Edema	12	6.0
No Complications	170	85.0
Satisfaction Level		
Very Satisfied	150	75.0
Satisfied	30	15.0
Neutral	10	5.0
Dissatisfied	10	5.0

DISCUSSION

The findings of this study align with other research examining the treatment and characteristics of cystic swellings of the scrotum, particularly in middle-aged men. The highest incidence of cystic swellings was observed in the 41-50 years age group (27.5%), consistent with studies by Malik et al. (2016) and Yusuf et al. (2018), which also noted a higher prevalence in middle-aged populations.^[8,9] This may be attributed to the gradual development of cysts such as hydroceles, epididymal cysts, and spermatoceles over time due to factors like minor trauma, infections, or degenerative changes in the genital area. In comparison, our study showed a relatively lower incidence in younger and older age groups, potentially due to fewer predisposing factors like degenerative changes. The symptoms reported by patients, such as scrotal swelling (90%), pain (70%), and heaviness (60%), mirror the findings of similar studies. Sakamoto et al. (2014) also reported that scrotal swelling and discomfort are the most common complaints among patients with hydroceles and epididymal cysts.^[10] The presence of pain in 70% of our cases supports the view that while these swellings are often benign, they can cause significant discomfort and require intervention when symptomatic. The lower percentage of patients reporting fever (15%) suggests that secondary infection or acute inflammation is not a primary issue in most cases of cystic scrotal swellings, which aligns with prior studies by Sinha et al. (2019) that also reported minimal systemic symptoms in cystic swellings.^[11]

Regarding the types of cystic swelling observed, our finding that hydrocele was the most common (60%) is consistent with previous studies. For instance, a study by Agarwal et al. (2017) found that hydroceles accounted for around 65% of cystic swellings, often resulting from fluid accumulation in the tunica vaginalis due to infections, trauma, or idiopathic causes.^[12] Epididymal cysts and spermatoceles accounted for 30% and 10% of cases, respectively, findings comparable to those reported by Das et al. (2015), where the incidence of epididymal cysts was similarly noted to be around 25-35%.^[13] Our clinical findings, such as the presence of fluctuation in 70% of patients and positive transillumination in 65%, are in line with the diagnostic features reported by Ahuja et

al. (2020), further supporting the utility of these physical examination methods in diagnosing fluid-filled scrotal masses.^[14] Ultrasound was instrumental in confirming the diagnoses, with findings of hydroceles in 60% of cases, epididymal cysts in 30%, and spermatoceles in 10%. This parallels the diagnostic accuracy of ultrasound reported by Patel et al. (2019), who emphasized the non-invasive nature and high sensitivity of ultrasound in differentiating between types of scrotal swellings.^[15] Ultrasound remains a cornerstone in the evaluation of cystic scrotal swellings, as also evidenced by findings from research conducted by Moalem et al. (2018), which highlighted its utility in accurately distinguishing between solid and cystic masses.^[16] In terms of treatment, the high prevalence of open hydrocelectomy (60%) in this study is similar to the treatment approaches documented by Chalya et al. (2014), where open surgical excision was the most common procedure for symptomatic hydroceles.^[17] Cyst excision in 40% of cases, often performed for epididymal cysts or spermatoceles, was also consistent with surgical interventions noted by O'Neill et al. (2016).^[18] The absence of major intraoperative complications in 90% of cases highlights the safety of these procedures, echoing findings from studies by Ferrand et al. (2017) that reported low complication rates in scrotal surgeries.^[19] Postoperative complications were minimal, with scrotal edema being the most common (6%), followed by infection (5%) and hematoma (4%). These complications are comparable to those observed by Yu et al. (2019), who reported similar rates of postoperative issues in their cohort of patients undergoing hydrocelectomy or cyst excision.^[20] The high rate of patient satisfaction (75% very satisfied) at the 6-month follow-up in our study aligns with the outcomes seen in studies by Adoga et al. (2020), which also noted a high level of patient satisfaction following surgical treatment for scrotal swellings.^[21]

CONCLUSION

This clinical study highlights those cystic swellings of the scrotum, particularly hydroceles, epididymal cysts, and spermatoceles, are most prevalent in middle-aged men and can significantly affect quality of life due to discomfort and physical symptoms. Surgical intervention, including hydrocelectomy and

cyst excision, proved to be effective in treating symptomatic cases, with minimal complications and high patient satisfaction. The findings underscore the importance of early diagnosis and appropriate management to prevent complications and ensure better outcomes.

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