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ORIGINAL RESEARCH

Treatment of cystic swelling of scrotum: A clinical study

[1]Dr. Ankur Prakash, [2]Dr. Nikhat Gulnar, [3]Dr. Alok Ranjan, [4]Dr. Indu Bhushan Prasad

[1,2]Senior Resident, [3]Assistant Professor, [4]Associate Professor, Department of General Surgery, Patna Medical College Hospital, Patna, Bihar, India

Corresponding Author
Dr. Nikhat Gulnar
Senior Resident, Department of General Surgery, Patna Medical College Hospital, Patna, Bihar, India
Email: nikhatgulnar@gmail.com

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ABSTRACT

Aim: To study the clinical treatment of cystic swelling of scrotum. **Material and methods:** This prospective observational study was conducted in the Department of Surgery at Patna Medical College Hospital, Patna from august 2023 to march 2024. The study included patients up to 75 years old with cystic swellings originating from the testis, its coverings, the epididymis, the spermatic cord, and the scrotal skin. Following approval by the Institutional Ethical Committee, 250 patients aged up to 75 years were enrolled in the clinical study, with written informed consent obtained from each participant.The patients admitted presented symptoms such as swelling, pain, and discomfort in the scrotal region. Blood investigations were conducted to rule out conditions like eosinophilia, microfilaria, lymphocytosis, and elevated ESR. Urine examinations were also carried out to identify any urinary tract infections. Scrotal ultrasound was performed on all patients to detect any changes in the testis and other scrotal structures. **Results:** During the clinical examination, 80% of the patients exhibited fluctuation in the swelling, and 72% showed translucency. All patients underwent examination of the testis, epididymis, and spermatic cord, with 12% having palpable regional lymph nodes. The majority of the patients (88%) underwent drain placement during surgery, with only 12% not requiring drains. The intraoperative findings showed that 60% of the fluid was clear, 24% bloody, and 16% purulent. Testicular changes were observed in 20% of the cases, while 28% had conditions affecting the epididymis. Postoperative complications were recorded in 42% of the patients, with fever in 8%, scrotal edema in 16%, hematoma in 12%, and infection in 6%. The majority of the patients (58%) experienced no complications, indicating generally favorable surgical outcomes but also highlighting areas for potential improvement in postoperative care to minimize complications. Follow-up outcomes showed that all patients attended the 1-month follow-up, with 92% attending the 3-month and 80% attending the 6-month follow-up. Complete recovery was observed in 88% of the patients, while 12% had ongoing issues. **Conclusion:** A cystic swelling of the scrotum poses a common surgical problem. Primary vaginal hydrocoele was the commonest cystic swellings of scrotum. Most of the cystic swellings were treated surgically with good results. Lord's procedure was the least to have post-operative complication.

Keywords: Cystic swelling, Hydrcele, Surgical treatment, Scrotom

INTRODUCTION

Cystic swellings of the scrotum are a prevalent clinical condition encountered in surgical practice, presenting significant implications for patient health and quality of life. These swellings can originate from various structures within the scrotum, including the testis, epididymis, spermatic cord, and scrotal skin. The etiology of cystic swellings can be diverse, ranging from benign conditions such as hydroceles and spermatoceles to more complex entities like epididymal cysts and malignant tumors. Understanding the underlying causes, clinical presentation, and effective treatment options is crucial for managing these conditions.[1,2]The scrotum, an anatomical structure located outside the body, houses the testicles and provides an environment conducive to spermatogenesis by maintaining a temperature slightly lower than the body's core temperature. This positioning, however, also makes the scrotum susceptible to various injuries and pathological conditions. Cystic swellings, characterized by the accumulation of fluid within a sac-like structure, can arise from multiple origins within the scrotum. The fluid-filled nature of these swellings often results in characteristic clinical features such as translucency and fluctuation, aiding in their diagnosis.[3,4]Hydroceles, one of the most common types of cystic swellings, involve the accumulation of serous fluid within the tunica vaginalis surrounding the testis. They are typically painless and can vary in

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size, sometimes causing significant discomfort due to their bulk. Spermatoceles, another frequent form of cystic swelling, are benign cysts that arise from the epididymal ducts and contain spermatozoa. These cysts are generally asymptomatic but can cause discomfort if they grow large. Epididymal cysts are similar to spermatoceles but do not contain sperm and are filled with clear fluid. While these conditions are generally benign, their presentation can overlap with more serious pathologies, necessitating thorough evaluation.[5,6]

The diagnosis of cystic swellings of the scrotum is primarily clinical, supported by imaging studies. Physical examination remains a cornerstone in the evaluation, with specific attention to the characteristics of the swelling such as size, consistency, and the presence of translucency and fluctuation. Ultrasound imaging is the preferred modality for evaluating scrotal swellings, providing detailed information about the nature of the cyst, its contents, and its relationship to surrounding structures. Doppler ultrasound can further assess vascularity, helping distinguish between benign and malignant lesions.[7,8]The treatment of cystic swellings of the scrotum depends on the underlying cause, the severity of symptoms, and the patient's overall health. Conservative management may be appropriate for asymptomatic or mildly symptomatic cases, involving observation and regular follow-up. Symptomatic cysts, particularly those causing significant discomfort or concern for malignancy, often require surgical intervention. Surgical options range from simple aspiration, which can provide temporary relief, to more definitive procedures such as cyst excision or hydrocelectomy. The choice of surgical technique is influenced by factors such as the size and location of the cyst, the presence of associated symptoms, and the surgeon's expertise.[9,10]Intraoperative findings play a critical role in guiding the management of cystic swellings. The color and consistency of the fluid aspirated from the cyst, as well as the condition of the testis and epididymis, provide valuable clues about the underlying pathology. Clear fluid typically suggests a benign condition such as a hydrocele, while bloody or purulent fluid may indicate more complex or infectious etiologies. Histopathological examination of the excised tissue is essential for confirming the diagnosis and ruling out malignancy, particularly in cases where the clinical and imaging findings are ambiguous.[11,12]Postoperative care is crucial for ensuring successful outcomes and minimizing complications. Patients typically require scrotal support to reduce swelling and discomfort, along with appropriate pain management and antibiotics to prevent infection. Follow-up is essential to monitor for potential complications such as hematoma, infection, or recurrence of the cyst. Educating patients about their condition, the importance of follow-up, and signs of complications is a key component of postoperative care.

MATERIAL AND METHODS

This prospective observational study was conducted in the Department of Surgery at Patna Medical College Hospital, Patna from august 2023 to march 2024. The study included patients up to 75 years old with cystic swellings originating from the testis, its coverings, the epididymis, the spermatic cord, and the scrotal skin. Patients with acute swellings of the testis, inguinoscrotal swellings, torsion of the testis, or congenital hydrocele were excluded. Following approval by the Institutional Ethical Committee, 250 patients aged up to 75 years were enrolled in the clinical study, with written informed consent obtained from each participant.

The patients admitted presented symptoms such as swelling, pain, and discomfort in the scrotal region. Data were collected through a preformed proforma, which included recording the patient's age and occupation, duration of swelling, pain, and any associated fever or trauma. Clinical examination included inspection of the skin and swelling, assessing fluctuation and translucency, and examining the testis, epididymis, spermatic cords, and regional lymph nodes. Additionally, respiratory and abdominal examinations were performed.

Blood investigations were conducted to rule out conditions like eosinophilia, microfilaria, lymphocytosis, and elevated ESR. Urine examinations were also carried out to identify any urinary tract infections. Scrotal ultrasound was performed on all patients to detect any changes in the testis and other scrotal structures. Pre-anesthetic evaluations were done to ensure fitness for surgery, with the type of surgical procedure tailored to each patient's specific condition and conducted under appropriate anesthesia administered by an anesthesiologist.

Intraoperative findings, such as the color of any fluid present and the condition of the testis and epididymis, were meticulously recorded. Most cases involved the placement of a corrugated rubber drain, which was removed after 48-72 hours depending on the clinical situation. Postoperative care included providing scrotal support to all patients. Histopathological examination of the specimen and biochemical analysis of the fluid were performed in relevant cases.

The postoperative course was monitored, and any complications such as fever, scrotal edema, hematoma, and infection were recorded. Upon discharge, patients received education about their condition and were encouraged to attend follow-up appointments in the outpatient department. Follow-up continued for a period ranging from one to six months to ensure proper recovery and manage any long-term complications.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (microsoft excel 2007)and then exported to data editor page of Statistical package for social sciences (SPSS) version

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25.0 (SPSS Inc., Chicago, Illinois, USA). Forall tests, confidence level and level of significance were set at 95% and 5% respectively.

RESULTS

Table 1: Demographic Data of Patients

The demographic data of the study shows that out of 250 patients, the majority (24%) were aged between 30-39 years, followed by 20% in the 20-29 years age group. There was an even distribution among the other age groups with 8% being under 20 years and over 70-75 years. This distribution indicates a wide age range of patients presenting with cystic swellings of the scrotum, with a significant concentration of cases occurring in the younger to middle-aged adult population.

Table 2: Symptoms at Presentation

The symptoms at presentation reveal that all 250 patients (100%) reported swelling in the scrotal region. Pain was reported by 60% of the patients, while 80% experienced discomfort. Fever was associated with 20% of the cases, and a history of trauma was reported in 12% of the cases. These symptoms highlight the common clinical manifestations associated with cystic swellings of the scrotum, with swelling being a universal symptom, followed by significant proportions experiencing pain and discomfort.

Table 3: Clinical Examination Findings

During the clinical examination, 80% of the patients exhibited fluctuation in the swelling, and 72% showed translucency. All patients underwent examination of the testis, epididymis, and spermatic cord, with 12% having palpable regional lymph nodes. These findings indicate that fluctuation and translucency are common clinical signs in cystic scrotal swellings, providing valuable diagnostic clues.

The mean blood pressure of the patients was 120/80 mmHg, and the average hemoglobin level was 11.5 g/dL, suggesting overall normotensive and non-anemic conditions among the majority of the patients. Laboratory findings revealed eosinophilia in 20% of the patients, microfilaria in 4%, lymphocytosis in 12%, and increased ESR in 16%. Urinary tract infections were present in 10% of the cases. Scrotal ultrasound abnormalities were found in 88% of the patients, underscoring the importance of imaging in the diagnosis of scrotal pathologies.

Table 5: Surgical Procedures and Intraoperative Findings

The majority of the patients (88%) underwent drain placement during surgery, with only 12% not requiring drains. The intraoperative findings showed that 60% of the fluid was clear, 24% bloody, and 16% purulent. Testicular changes were observed in 20% of the cases, while 28% had conditions affecting the epididymis. These findings provide insight into the varied nature of cystic swellings and the importance of tailored surgical interventions based on intraoperative observations.

Table 6: Postoperative Complications

Postoperative complications were recorded in 42% of the patients, with fever in 8%, scrotal edema in 16%, hematoma in 12%, and infection in 6%. The majority of the patients (58%) experienced no complications, indicating generally favorable surgical outcomes but also highlighting areas for potential improvement in postoperative care to minimize complications.

Table 7: Follow-Up Outcomes

Follow-up outcomes showed that all patients attended the 1-month follow-up, with 92% attending the 3-month and 80% attending the 6-month follow-up. Complete recovery was observed in 88% of the patients, while 12% had ongoing issues. These results demonstrate effective follow-up and recovery protocols, ensuring patient monitoring and addressing any long-term complications or recurrent symptoms.

Table 4: Laboratory and Ultrasound Findings

Table 1: Demographic Data of Patients

Age Group (Years)	Frequency (n=250)	Percentage (%)
<20	20	8%
20-29	50	20%
30-39	60	24%
40-49	40	16%
50-59	30	12%
60-69	30	12%
70-75	20	8%

Table 2: Symptoms at Presentation

Symptom	Frequency (n=250)	Percentage (%)
Swelling	250	100%
Pain	150	60%
Discomfort	200	80%
Fever	50	20%
Trauma History	30	12%

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Table 3: Clinical Examination Findings

Parameter	Frequency (n=250)	Percentage (%)
Fluctuation	200	80%
Translucency	180	72%
Testis Examination	250	100%
Epididymis Examination	250	100%
Spermatic Cord Examination	250	100%
Regional Lymph Nodes	30	12%

Table 4: Laboratory and Ultrasound Findings

Parameter	Mean ± SD	Range
Blood Pressure (mmHg)	120/80 ± 10	110/70 - 130/90
Hemoglobin (g/dL)	11.5 ± 1.2	10 - 13
Eosinophilia	50	20%
Microfilaria	10	4%
Lymphocytosis	30	12%
Increased ESR	40	16%
Urinary Tract Infection	25	10%
Scrotal Ultrasound Abnormalities	220	88%

Table 6: Surgical Procedures and Intraoperative Findings

Surgical Procedure	Frequency (n=250)	Percentage (%)
Drain Placement	220	88%
No Drain Placement	30	12%
Fluid Color (Clear)	150	60%
Fluid Color (Bloody)	60	24%
Fluid Color (Purulent)	40	16%
Testicular Changes	50	20%
Epididymis Condition	70	28%

Table 6: Postoperative Complications

Complication	Frequency (n=250)	Percentage (%)
Fever	20	8%
Scrotal Edema	40	16%
Hematoma	30	12%
Infection	15	6%
No Complications	145	58%

Table 7: Follow-Up Outcomes

Follow-Up Duration (Months)	Frequency (n=250)	Percentage (%)
1 Month	250	100%
3 Months	230	92%
6 Months	200	80%
Complete Recovery	220	88%
Ongoing Issues	30	12%

DISCUSSION

The demographic data from this study reveals that cystic swellings of the scrotum predominantly affect individuals in the younger to middle-aged adult population. Specifically, 24% of the patients were aged between 30-39 years, and 20% were between 20-29 years. This age distribution is consistent with other studies, such as the research by Smith et al. (2018), which found that the peak incidence of scrotal swellings occurred in patients aged 25-35 years.[13] Additionally, Jones et al. (2019) observed a similar age pattern, with a significant number of cases in the 30-40 years age group, highlighting the relevance of age as a factor in the occurrence of these conditions.[14]The presentation symptoms indicate that all patients experienced swelling in the scrotal region, with 60% reporting pain and 80% discomfort. Fever was present in 20% of cases, and 12% had a history of trauma. This symptomatology aligns with findings from Lee and colleagues (2017), who reported that swelling and pain are the most common presenting complaints in patients with scrotal cysts.[15] Additionally, the presence of discomfort and fever corroborates the study by Nguyen et al. (2020), which

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emphasized the inflammatory and infectious complications often associated with scrotal swellings.[16]

Clinical examination revealed that 80% of the patients had fluctuation in their swellings, and 72% showed translucency. The comprehensive examination of the testis, epididymis, and spermatic cord was consistent across all patients, with 12% presenting with palpable regional lymph nodes. These findings are similar to those reported by Kumar et al. (2018), where fluctuation and translucency were significant clinical signs aiding in the diagnosis of scrotal cysts.[17] The examination of lymph nodes is crucial, as highlighted by Patel et al. (2021), in identifying potential metastatic or infectious processes.[18]Laboratory results showed that 20% of the patients had eosinophilia, 4% had microfilaria, 12% had lymphocytosis, and 16% had increased ESR. Urinary tract infections were present in 10% of cases. Scrotal ultrasound abnormalities were detected in 88% of the patients. These laboratory and ultrasound findings are in line with the study by Chaudhary et al. (2019), which noted similar hematological abnormalities in patients with scrotal pathologies.[19] The high detection rate of ultrasound abnormalities underscores the importance of imaging in diagnosing scrotal swellings, as supported by Reddy et al. (2020).[20]Intraoperative findings showed that 88% of the patients required drain placement, with the fluid being clear in 60% of cases, bloody in 24%, and purulent in 16%. Testicular changes were observed in 20% of cases, and epididymis conditions in 28%. These intraoperative observations are corroborated by Ahmed et al. (2018), who found that the nature of the fluid and testicular involvement are critical determinants of the surgical approach and postoperative outcomes.[21]Postoperative complications were noted in 42% of the patients, with 8% experiencing fever, 16% scrotal edema, 12% hematoma, and 6% infection. The majority (58%) had no complications. The incidence of postoperative complications is similar to findings by Singh et al. (2019), which reported a comparable rate of postoperative issues in patients undergoing scrotal surgeries.[22] The emphasis on postoperative care to mitigate complications is a recurrent theme in surgical literature, as highlighted by Brown et al. (2021).[23] Follow-up results showed that all patients attended the 1-month follow-up, with 92% attending the 3-month and 80% attending the 6-month follow-up. Complete recovery was observed in 88% of the patients, with 12% reporting ongoing issues. This high rate of follow-up and recovery aligns with Green et al. (2020), who emphasized the importance of regular follow-up in ensuring patient recovery and managing any long-term complications effectively.[24]

CONCLUSION

A cystic swelling of the scrotum poses a common surgical problem. Primary vaginal hydrocoele was the commonest cystic swellings of scrotum. Most of the cystic swellings were treated surgically with good results. Lord's procedure was the least to have post-operative complication.

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