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Original Research Article

Clinical study on cystic swellings of the scrotum in adults in a tertiary care hospital

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ABSTRACT

Background: Cystic swellings of the scrotum are common clinical entities that surgeons encounter in daily practice. Males of all ages are affected. Today, considerable heterogeneity exists in their treatment. This study sought to identify the prevalence and patterns of presentation of these swellings in adults and evaluate the different modalities of surgical management.
Methods: A cross-sectional study was undertaken from January 2013 to December 2016. A total of 186 patients fulfilling the inclusion criteria were included. Data was collected using a proforma. All patients were managed surgically.
Results: Majority of cases (28%) were observed between 41-50 years (mean age 43.9 years). In 71%, mode of presentation was a painless, gradually progressive swelling. Mean duration of symptoms was 17.3 months. Primary vaginal hydrocele was the commonest swelling encountered (in 73.1%). Jaboulay's procedure was undertaken in 75.2% of patients. Lord's plication was associated with a comparatively shorter operative time, lesser postoperative scrotal edema and a shorter hospital stay. Epididymal cysts accounted for 19.4% and were managed by excision. The most common complication observed irrespective of surgery performed was scrotal edema (in 36%). Hematoma and infection were less frequently observed. Patients were followed-up for a mean period of 1.8 months. No recurrences were detected during this period.
Conclusions: Cystic swellings of the scrotum are conditions predominantly affecting middle-aged males. Among these, primary hydrocele is the commonest. Although Lord's plication is simpler and gives good results with fewer complications, Jaboulay's procedure remains the gold standard for surgical management of hydrocele.

Keywords: Epididymal cyst, Hydrocele, Jaboulay's procedure, Lord's placation

INTRODUCTION

Cystic swellings of the scrotum are widely considered one of the most common clinical entities that a surgeon comes across in daily practice. Defined as abnormal collections of fluid within the scrotal cavity, they affect males of all age groups and account for the majority of all scrotal swellings.

Although easily detectable, the vast majority remain asymptomatic, and attain a considerable size before causing discomfort to the patient.[1] Most patients, however, hesitate to seek medical attention during the early stages, these swellings being a source of embarrassment and due to a lack of awareness. This results in considerable physical, psychological, social, and economic distress.[2] These patients often present late with complications.

Hence, although mortality associated with this condition is negligible, morbidity can be significant. The etiology of the cystic causes of scrotal enlargement is diverse, it

ranges from hydrocoele (the most common cause of such swellings), to spermatocoele and epididymal cyst to less common ones like haematocoele, pyocoele and chylocoele. Most of these swellings are benign.[3]

Even so, an accurate diagnosis is crucial; acute conditions such as pyoceles and hematoceles require prompt intervention to prevent irreversible testicular injury. Conditions like old clotted hematoceles may simulate malignancy clinically and testicular malignancy itself may present as a secondary hydrocele.

The gold standard treatment for cystic swellings of the scrotum is surgery irrespective of the etiopathogenesis. A number of operative interventions have been advocated each of them with unique post-operative complications and different rates of recurrence.[4] For the treatment of idiopathic hydrocele, the majority are variations of three primary procedures: excision, eversion and window or internal drainage procedures.[5]

The commonly performed operative interventions such as Jaboulay's partial excision and eversion, Lord's plication, radical excision and vaginal fenestration may be considered modifications of the above basic techniques.[6] Epididymal cysts and spermatocoeles are treated by excision. Pyoceles and hematoceles, when presenting early, may be managed by incision and drainage. Intra-operative complications most commonly encountered following surgery include hemorrhage, injury to cord structures and torsion testis due to faulty positioning. Post operative complications include edema, hematoma formation, infection and recurrence.[7]

This study sought to identify the age wise distribution, clinical patterns of presentation, the varied etiology and related predisposing factors for different types of cystic swellings of the scrotum in adults. The various modalities of surgical treatment presently available were also compared with regard to post-operative complications and recurrence rates.

METHODS

This study was undertaken at Bowring and Lady Curzon and Victoria Hospitals, tertiary hospitals, attached to Bangalore Medical College and Research Institute, Karnataka, India.

Patients admitted for the treatment of cystic swellings of the scrotum were consecutively selected from January 2013 to December 2016. A total of 186 cases were identified and included in the study. The study design was cross sectional.

Inclusion criteria

- In-patients with a diagnosis of cystic swellings of the scrotum admitted to Victoria Hospital and Bowring and Lady Curzon Hospital during the study period
- Patients willing to give written informed consent
- Patients aged 18 years and above
- All intrascrotal and extratesticular swellings

Exclusion criteria

- Patients who are not willing to give informed consent
- Patients aged less than 18 years
- Patients with severe infection and those who are seriously ill
- Inguinoscrotal swellings
- Swellings arising from the skin of the scrotum

After obtaining ethical committee approval, in-patients with cystic swellings of the scrotum fulfilling the inclusion criteria and consenting to participate were enrolled in the study.

The data obtained was recorded in a predesigned proforma. Diagnosis was clinical and supported by scrotal ultrasonography in all cases. All cases were treated surgically. The specific surgical intervention to be undertaken and the anaesthesia required were decided by the attending surgeon based on the clinical and radiological findings.

Preoperatively, antimicrobial prophylaxis using intravenous ceftriaxone was given in all patients. Relevant intraoperative findings were noted. The time taken for completion of the various procedures was recorded. Rubber corrugated drains were used when indicated as per the discretion of the surgeon and removed within 48 hours.

All patients were given scrotal support and appropriate antibiotics, analgesics and anti-inflammatory medication. Postoperative course and the incidence and management of surgical complications, if any, were recorded. All complications were managed conservatively. Patients were counseled regarding follow-up at the time of discharge. The statistical package for social sciences (SPSS version 23.0) software for Windows was employed in statistical analysis. Descriptive statistics were calculated for all variables. Statistical significance was set at $p < 0.05$ for all comparisons.

RESULTS

In the present study of 186 patients, the mean age of presentation was 43.9 years. The youngest patient in the study population presented at the age of 18 years and the oldest at the age of 76 years.

The maximum number of subjects was seen in the 41-50 years age group (n=52) accounting for 28%, followed by the 31-40 years age group (n=43). This distribution

remained unchanged even when comparing the age at presentation of the different types of cystic swellings with most cases clustered in the 41-50 years age bracket (Table 1).

Table 1: Age related frequency of cystic swellings of the scrotum encountered in the study.

		Diagnosis						Total
		Primary hydrocele (PH)	Secondary hydrocele (SH)	Epididymal cyst (EC)	Spermatocele (SP)	Hematocele (HE)	Pyocele (PY)	
Age group of patients	<21	2	0	2	0	0	0	4
	21-30	28	0	4	0	0	2	34
	31-40	32	1	8	1	0	1	43
	41-50	34	3	12	1	1	1	52
	51-60	26	0	4	0	1	1	32
	61-70	8	1	4	0	0	0	13
	>70	6	0	2	0	0	0	8
Total		**136**	**5**	**36**	**2**	**2**	**5**	**186**

Table 2: Mean duration of symptoms for patients with cystic swellings of the scrotum.

Diagnosis	Mean	N	Std. deviation	Minimum	Maximum	Range
Primary hydrocele (PH)	18.9853	136	6.21704	8.00	36.00	28.00
Secondary hydrocele (SH)	6.6000	5	3.13050	4.00	12.00	8.00
Epididymal cyst (EC)	14.7222	36	4.63287	8.00	24.00	16.00
Spermatocele (SP)	21.0000	2	4.24264	18.00	24.00	6.00
Hematocele (HE)	6.0000	2	.00000	6.00	6.00	.00
Pyocele (PY)	3.6000	5	1.81659	1.00	6.00	5.00
Total	**17.2957**	**186**	**6.76187**	**1.00**	**36.00**	**35.00**

Hydrocele was the most common cystic swelling of the scrotum encountered. It comprised 75.8% of the study population. Epididymal cysts accounted for 19.4% of the study population (Figure 1).

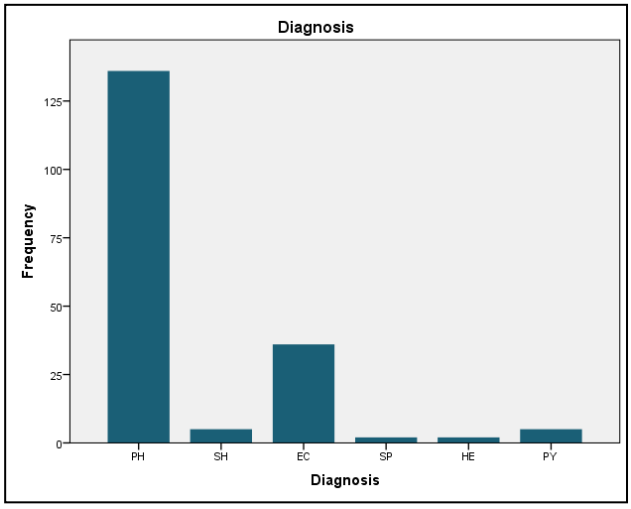

Figure 1: Frequency of the various cystic swellings of the scrotum encountered in the study.

Mean duration of symptoms for patients with cystic swellings of the scrotum was 17.3 months. It ranged from one month to three years (Table 2).

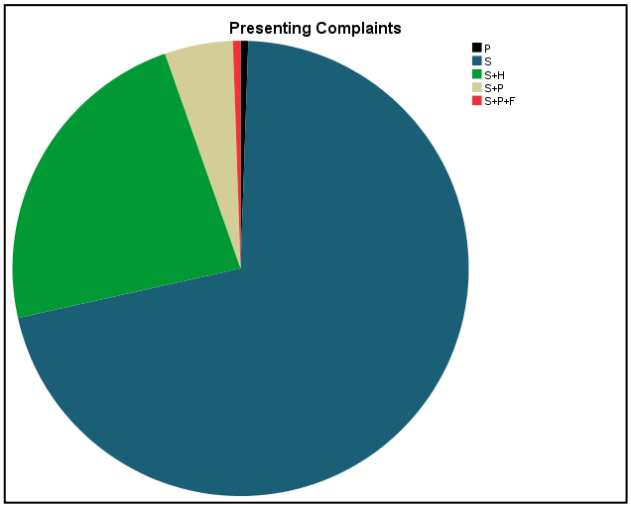

Figure 2: Presenting complaints of subjects included in the study (P: pain, S: swelling, H: heaviness, F: fever).

Of the 186 subjects, 71% had no symptoms apart from the swelling. In 23.1% of subjects, swelling was associated with heaviness (Figure 2). Right sided swellings were found to be more common (Table 3).

Table 3: Side distribution observed for cystic scrotal swellings.

		Diagnosis						Total
		PH	SH	EC	SP	HE	PY	
Side of the swelling	Right	60	3	12	2	1	3	81
	Left	52	1	14	0	1	2	70
	Bilateral	24	1	10	0	0	0	35
Total		**136**	**5**	**36**	**2**	**2**	**5**	**186**

Table 4: Surgical management in the various cystic swellings of the scrotum.

		Type of surgery performed					Total
		Jabouleys (JB)	Lords plication (LP)	Excision (EX)	Incision drainage (ID)	Orchidectomy (OR)	
Diagnosis	PH	102	32	0	0	2	136
	SH	4	0	0	0	1	5
	EC	0	0	36	0	0	36
	SP	0	0	2	0	0	2
	HE	0	0	0	0	2	2
	PY	0	0	0	1	4	5
Total		**106**	**32**	**38**	**1**	**9**	**186**

Table 5: The mean duration of hospital stay for the various surgical modalities of treatment.

Type of surgery performed	Mean	N	Std. deviation	Minimum	Maximum	Range
Jabouleys (JB)	4.5849	106	1.11157	3.00	8.00	5.00
Lords plication (LP)	3.1250	32	1.18458	2.00	7.00	5.00
Excision (EX)	3.8684	38	1.09473	3.00	8.00	5.00
Incision drainage (ID)	7.0000	1	.	7.00	7.00	.00
Orchidectomy (OR)	6.7778	9	.97183	5.00	8.00	3.00
Total	**4.3065**	**186**	**1.37060**	**2.00**	**8.00**	**6.00**

The most commonly performed surgery was Jabouley's procedure (in 57% of patients). Lord's plication was performed in 17.2% and excision in 20.4% (Table 4).

Post-operative complications (as evidenced by scrotal wall edema, hematoma formation or infection) was seen in 50% of patients undergoing Jabouley's procedure and 12.5% of those undergoing Lord's plication.

Three of the 38 patients who underwent excision and 6 of the 9 patients who underwent orchidectomy developed this complication (Figure 3).

The mean duration of hospital stay for the various surgical modalities of treatment was 4.3 days (Table 5). The average duration of follow-up was 1.8 months (ranging from 0 to 4 months).

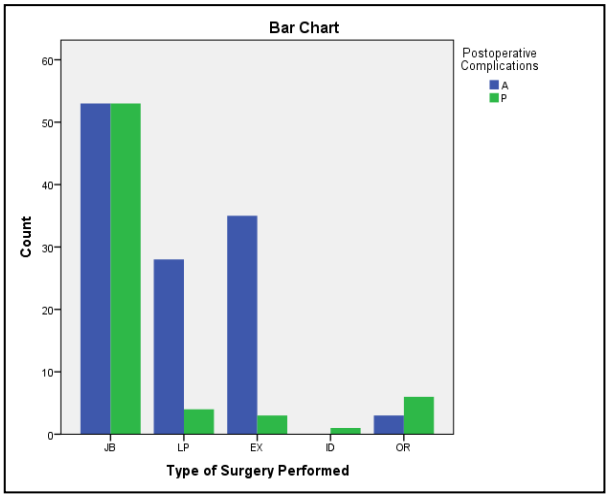

Figure 3: Incidence of postoperative complications with regard to the modality of treatment.

DISCUSSION

Scrotal masses may occur at any age from infancy to senescence, with the underlying causes distributed evenly across the age spectrum.[8,9]

As evident in this study, 51.1% of males included were in the economically productive age group of 31-50 years. As chronic conditions affecting males, the peak incidence of cystic swellings of the scrotum at this age can pose a significant economic burden for the patient and his dependants and have psychosocial implications. Other studies too have reported similar results. In the study conducted by Ku et al (2001), most of the patients belonged to the age group of 41-50 years with a range of 16 to 83 years.[6] Subith et al (2014), in their assessment of 170 cases of cystic scrotal swellings, observed that 40% of patients were between 31 and 40 years of age.[10]

Clinical examination was adequate to establish the diagnosis. Nevertheless, all patients were subjected to a scrotal ultrasound in order to confirm the diagnosis and rule out concomitant testicular pathology. Hydrocele was the most common cystic swelling of the scrotum encountered in all age groups. No precipitating cause could be detected in 136 cases; these cases were labeled as primary or idiopathic. Of the cases of secondary hydrocele, 4 developed following previous episodes of epididymo-orchitis. One patient with a hydrocele was found to have an underlying testicular malignancy on scrotal ultrasound.

The mean age at presentation of these swellings was 43.3 years. These findings are in agreement with those of Leung et al. In their study involving scrotal sonological imaging in asymptomatic subjects, they concluded that hydroceles affect approximately 1% of adults and the primary variety was seen most commonly in men older than the age of 40.[11]

The other swellings commonly encountered were epididymal cysts (accounting for 19.4% of cases). The difference in average age at presentation for the various cystic swellings was not found to be statistically significant.

Primary vaginal hydroceles are more commonly right sided. In the present study, 44.1% of idiopathic hydroceles were right sided and 17.7% were found to be bilateral. Although hydroceles are considered to be bilateral in 7–10% of patients, this figure has been known to vary markedly in different studies.[2] This apart, 10 cases of epididymal cyst and 2 case of secondary hydrocele were found to be bilateral.

With regard to the mode of presentation, 71% of patients had no symptoms apart from the swelling. In 23.1% of subjects, swelling was associated with a dragging sensation more appreciable after exertion or towards the end of the day. It was more commonly seen with large swellings of long-standing duration. Swelling with pain and fever were seen in patients with acute infective conditions of the scrotum. The mode of presentation has been reflected in other studies conducted on cystic swellings of the scrotum as well. Subith et al (2014) found that scrotal swelling was the presenting complaint in 59% of cases. It was associated with pain in 28%. In the majority comprising 46% of patients, the mean duration of swelling before presentation was 1-2 years. In 17%, the duration of symptoms was for more than 2 years.[10]

In this study, the average duration of symptoms before presentation was 17.3 months. Secondary hydrocele, hematocele and pyocele had a more acute presentation since these were often associated with pain and constitutional symptoms which prompted patients to seek medical advice early.

Surgical management under spinal anaesthesia was employed in all patients in the study population. Intraoperatively, the appearance of the testis, epididymis and spermatic cord were noted. Although orchidectomy is not the standard of treatment in cases of hematocele and pyocele, long standing cases are often associated with atrophy and devitalization of the testes. The testes in these instances are not viable. Also, a number of cases treated with broad spectrum antibiotics and surgical drainage ultimately require orchidectomy.[12,13] In the present study, scrotal ultrasound was used to assess preoperative status of the testes in all patients. The testes were found to be atrophic and avascular in 8 patients. These subjects were counseled regarding the nature of disease and the need for orchidectomy. Prior informed written consent was taken from the patient and his relatives before this procedure. One patient with a hydrocele secondary to testicular malignancy underwent a high inguinal orchidectomy.

Primary vaginal hydrocoele was managed by either Lord's plication or Jaboulay's procedure based on the merits of the case and the discretion of the attending surgeon. Jabouley's excision and eversion of the sac was the most commonly performed surgical procedure in this study; it was undertaken in 106 patients with large, floppy hydrocele sacs, of which 4 were secondary hydroceles. Lord's plication was performed in 32 patients with small, thin walled sacs.

Complications following scrotal surgery have been extensively evaluated in literature. According to a retrospective study conducted by Kiddoo et al (2004), the overall complication rate following outpatient scrotal surgery was 19.2% and the most common complications witnessed after surgery for hydroceles and spermatoceles were persistent scrotal swelling, inflammation and postoperative infection.[7] Other less frequent ones include recurrence, injury to spermatic vessels, and chronic pain. In another retrospective study comparing the frequency of complications after surgery for benign scrotal

conditions, Swartz et al reported that the overall complication rate was 20% and included recurrence or persistent swelling (6%), hematoma (5%), and infections (3.6%); 95% of complications were seen after hydrocelectomy.[14]

Scrotal edema is considered the most common complication following hydrocele surgery. Studies have shown that techniques involving extensive dissection to mobilize the hydrocele sac are most likely to result in this complication. Incidence of scrotal swelling was also found to correlate with the volume of the hydrocele.[15]

In our study too, the most common complication observed irrespective of the operation performed was persistent edema. Overall, it was seen in 36% of patients. On comparing the procedures for hydrocele, edema was observed more frequently in patients undergoing Jabouley's procedure (50%), possibly due to the extent of dissection undertaken to mobilize the sac. Edema was seen in only 4 of the 32 patients (12.5%) who underwent Lord's plication.

These findings are similar to observations made by other authors. Rodriguez et al compared the complication rates of various techniques and found that hydrocele excision was followed by marked edema in 76% of cases and Jabouley's technique to have rate of 91%. Both procedures involved extensive mobilisation of the sac. In contrast, Lord's plication technique which does not require dissection of the hydrocele sac from the dartos layer had a 10% rate of postoperative edema.[16] Ku et al also found a similar variation in the rates of scrotal edema after sac excision and Lord's procedure (74% and 8% respectively).[6]

Hematoma formation and surgical site infection are other common complication after scrotal surgery. The various procedures have different rates of hematoma formation; the degree of dissection involved while mobilizing the hydrocele sac is pivotal in pathogenesis. In the present study, 7 of the 106 patients (6.6%) who underwent Jabouley's procedure developed hematoma formation. This complication was not seen in patients undergoing Lord's plication. Five of the 106 patients (4.7%) in the Jabouley's procedure group developed surgical site infection whereas 2 patients who had undergone Lord's plication developed this complication (6.3%). In this study, all complications observed were managed conservatively. Broad spectrum antibiotics, scrotal support and analgesics were used and any hematoma or pus collection was evacuated.

Although, Lord's plication appears to be more advantageous than Jabouley's procedure in terms of postoperative complications and duration of hospital stay, it may not be appropriate in all cases of hydrocele. Plication of thick walled secondary and long-standing hydrocele sacs can result in a residual mass of plicated tissue in the scrotum. These cases are best managed with partial excision and eversion of the sac. Hence, Jaboulay's procedure is considered the surgical modality of choice for management of hydroceles.

Epididymal cysts were the second most common cystic swellings noted in this study. These cystic lesions of the scrotal cavity were treated by excision. Two cases of spermatocele were diagnosed following histopathological examination of the specimen. As for the complications, three patients developed scrotal edema and of these, one was associated with a hematoma formation. One case of pyocoele was incised and drained with supportive antibiotics and analgesics.

Recurrence rates have been historically similar among the various procedures. Of the three basic techniques for hydrocele, excision and eversion procedures have a 0 to 4 % risk of recurrence.[16,17] Patients were discharged after an average of 4.3 days in the hospital. The average duration of follow-up was 1.8 months (ranging from 0 to 4 months). No recurrences were noted during this period.

CONCLUSION

Cystic swellings of the scrotum are common conditions that a surgeon comes across in daily practice. They are often associated with considerable morbidity in terms of physical, psychological, social, and economic outcomes. Males of all age groups may be affected, the most common mode of presentation being a painless, gradually progressive swelling in the scrotum. Hydrocele was the most common swelling encountered in all age groups. The other swellings encountered were epididymal cysts and pyoceles.

All patients were managed surgically. Primary vaginal hydrocoele was managed by either Jaboulay's procedure or Lord's plication based on the merits of the case. Lord's plication was associated with lesser postoperative complications and a shorter hospital stay. However, it may not be appropriate in cases of thick walled, secondary and long-standing hydroceles. Such cases are best managed with partial excision and eversion of the sac. Hence, Jaboulay's procedure is considered the surgical modality of choice for management of hydroceles.

Epididymal cysts and spermatoceles were treated by excision. An orchidectomy was undertaken in cases where the testis was found to atrophic, devitalized or when it was suspected to be harbouring malignancy.

The most common complication observed in the study population was persistent scrotal edema. Other commonly observed ones were hematoma and surgical site infection. All complications were managed conservatively. Follow up for up to 4 months was undertaken. No recurrences were detected during this period.

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