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A comparative study of clinical presentation, surgical procedures and complications of primary vaginal hydroces

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Abstract:
Introduction*: "Primary vaginal hydrocele is defined as abnormal accumulation of serous fluid in tunica vaginalis." It is one of commonest disease occurring worldwide. The common complications observed during the surgery of hydrocele are bleeding, injury to the cord structures and epididymis, torsion of the testis due to faulty positioning during surgery. There are many number of types of operations performed for hydrocele, which needs comparision to select best of them.*
Aims And Objectives Of Study: *1. To study various surgical procedures of hydrocele management. 2. To assess postoperative complications, morbidity associated with different surgical procedures. 3. To analyse the simplicity, expenditure & effectiveness of different procedures. 4. To follow up the case for postoperative complications and its management.*
Materials And Methods*: A study was carried out in sixty patients of idiopathic primary vaginal hydrocele on the patients at Sri Venkateswara Ramnarayana Ruia government general hospital. The cases were admitted between October 2010 and October 2012.*
Summary*: This study consists of operative treatment of primary vaginal hydrocele by various surgical techniques like Lord's plication, Jaboulay's procedure, radical excision of sac and Jhawar and Sharma technique for the period of 24 months from October 2010 to October 2012.*
Conclusion*: Lord's plication, Jhawar and Sharma techniques in comparison to conventional methods are much easier and simpler in technique, consume less time. They can be done through a small incision and as the sac is not stripped from the surrounding scrotal tissues, cause minimal bleeding, postoperative haematoma does not occur and consequently disruption of wound etc., can be prevented.*

I. Introduction

"Primary vaginal hydrocele is defined as abnormal accumulation of serous fluid in tunica vaginalis."

It is one of commonest disease occurring worldwide. Hydrocele is a common disease in tropical countries especially where filariasis is common. In India the highest incidence is seen along the coastal belt.

Surgery has been the traditional treatment of choice for hydrocele, which is relatively simple and generally known. The most common surgical procedures for hydrocele are Lord's plication and Jaboulay's procedure.

However the surgery for hydrocele has a significant morbidity rate. The common complications observed during the surgery of hydrocele are bleeding, injury to the cord structures and epididymis, torsion of the testis due to faulty positioning during surgery. Commonest among these is post-operative haematoma which is due to oozing from small vessels. Unless meticulous haemostasis is secured oozing from small vessels may continue into the layers of the loose scrotal tissue giving rise to a haematoma. It is apt to say that a patient comes for surgery of a tennis ball and goes back with a cricket ball, considering the size and weight.

II. Aims And Objectives Of Study

1. To study various surgical procedures of hydrocele management.
2. To assess postoperative complications, morbidity associated with different surgical procedures.
3. To analyse the simplicity, expenditure & effectiveness of different procedures.
4. To follow up the case for postoperative complications and its management.

III. Materials And Methods

Source of data:

A study was carried out in sixty patients of idiopathic primary vaginal hydrocele on the patients at Sri Venkateswara Ramnarayana Ruia government general hospital. The cases were admitted between October 2010 and October 2012.

Method of collection of data:

The patients who presented in the OPD with a swelling in the scrotum were identified and following inclusion and exclusion criteria applied.

Inclusion criteria:

A) Solitary swelling in the scrotum incorporating the testis.
B) The swelling should be positive for trans-illumination.
C) It should be possible to get above the swelling at the root of the scrotum.
D) In a patient with bilateral hydrocele each hydrocele will be considered as a separate case in this study.

Exclusion criteria:

A)Swelling arising from the skin of the scrotum.
B) Solitary swelling in the scrotum which is separate from the testis.
C)Diffuse swelling in the scrotum incorporating the testis but negative on transillumination.
D)Swelling in which there is associated impulse on coughing and reducibility.

All men with primary vaginal hydrocele with no signs of hernia or other scrotal disease were selected. A total of 60 patients were selected for the study between October 2010 to October 2012. A Proforma was filled from admission day until the patient was discharged. Out of 60 patients who were studied 48 patients had unilateral and 12 patients had bilateral hydrocele. This will make a total of 72 cases which were divided equally and subjected to four different procedures and results were studied. Out of these 18 cases were subjected to Lord's plication, 18 cases for Jaboulay's procedure, 18 cases for radical excision of sac, and another 18 cases for Jhawar and Sharma technique.

The patients are monitored for immediate and late complications, focusing on scrotal edema, haematoma, infection and recurrence using the following criteria:

Scrotal edema – Any degree of scrotal wall swelling with loss of normal rugae.

Haematoma – Any visible or palpable collection of blood.

Infection – Any evidence of inflammation of the scrotal wound with induration, erythema, increased temperature and exudation.

Recurrence – Any visible or palpable fluid collection that appears and persists 3 months post-operatively.

Chi square test was used for finding the difference between proportions in the assessment of postoperative complications.

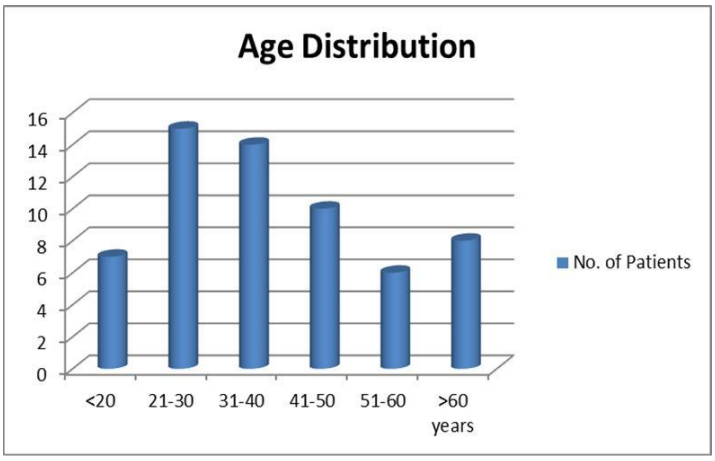
IV. Results

4.1 Age Incidence

Table – 1: Age distribution

Age in years	No.of patients	Percentage
<20	7	11.66
21-30	15	25
31-40	14	23.33
41-50	10	16.6
51-60	6	10
>60	8	13.3
Total	60	100

The youngest patient is 17 years old and the oldest is 78 years.
The maximum number of cases were seen in the age group of 21-30 years.
The minimum number of cases were seen in the age group of 51 to 60 years



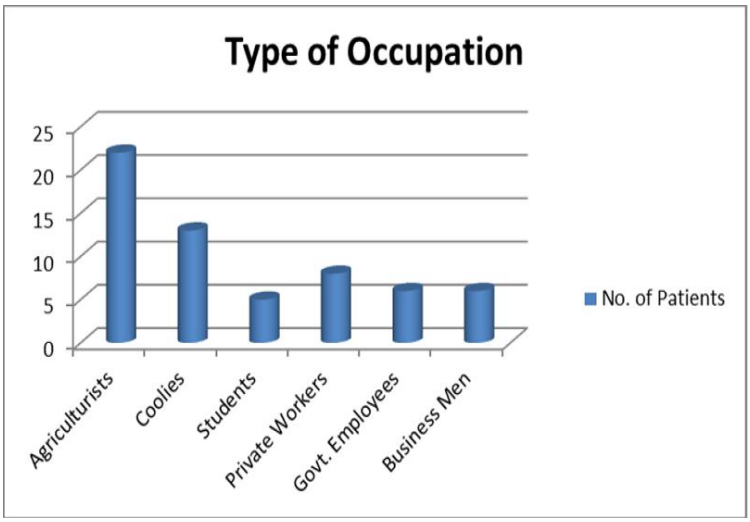
Graph - 1

4.2 Occupation

Table – 2 : Type of Occupation

Occupation	No.of patients	Percentage
Agriculturists	**22**	**36.66**
Coolies	**13**	**21.66**
Students	**5**	**8.33**
Private workers	**8**	**13.33**
Govt.Employees	**6**	**10**
Business men	**6**	**10**
Total	**60**	**100**

In this part of our state, hydrocele is more common among the agriculturists and coolies. Most of the patients coming to Sri Venkateswara Ramanarayana Ruia Government general hospital and included in our study were Agriculturists and coolies. Some were students. Hence most patients who have received treatment were of low socioeconomic state.



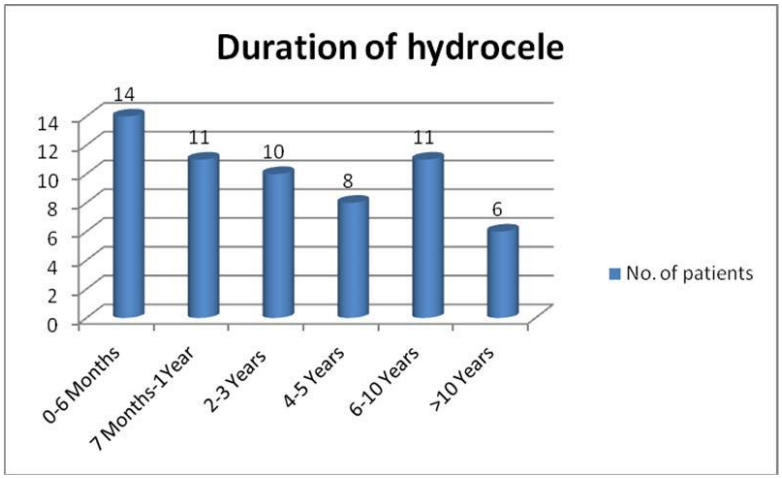
Graph - 2

4.3 Duration

Table – 3: Duration of Hydrocele

Duration in years	No. of patients	Percentage
0-6 Months	14	23.33
7 months-1 year	11	18.33
2-3 yrs	10	16.66
4-5yrs	8	25.00
6-10yrs	11	18.33
>10yrs	6	10.00
Total	60	100

From the above table, it is obvious that more number of patients, in this study are of 0-6 months duration. The least duration of hydrocele that came for the treatment was minimum 2 months to maximum duration of 15 years. Since most of our patients were labourers and farmers who were illiterate and neglected the disease. Hence they sought late medical advice.



Graph – 3

4.4 Side Of Hydrocele

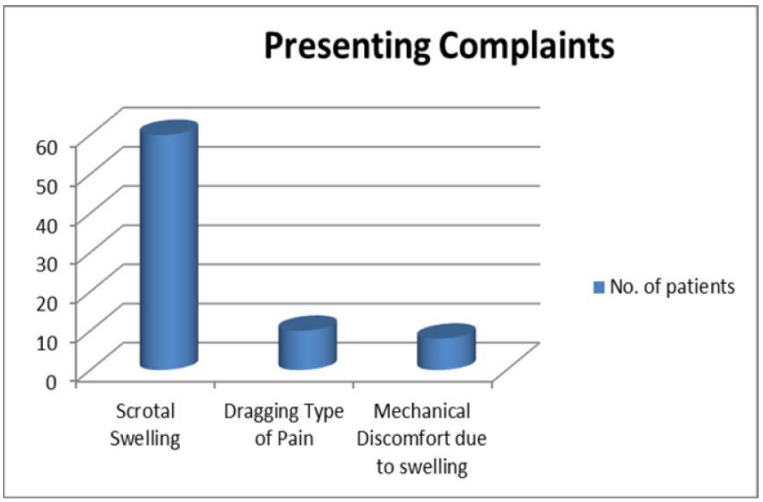
Table – 4 : Side of Hydrocele

Side	No.of patients	Percentage
Right	27	45
Left	21	35
Bilateral	12	20
Total	60	100

The hydrocele is predominant on right side in case of our study.

4.5 Presentation

All patients in this study presented with scrotal swelling i.e. 60 patients. 10 patients had dragging type of pain of variable duration and 8 patients had mechanical discomfort due to scrotal swelling.



Graph - 4

4.5 Anesthesia

Table – 5 : Types of anaesthesia

Type of anaesthesia	No.of patients	Percentage
Spinal anaesthesia	36	60
Local anaesthesia	24	40
Total	60	100

4.6 Types Of Operations

In the current study, in case of bilateral hydrocele each side hydrocele is considered as a separate swelling. In the study totally 6o patients were taken in which 12 patients had bilateral hydrocele so total number f hydrocele swellings are 72. These patients were divided into four groups each group comprising of 18 hydroceles. These four groups were subjected to four different surgeries and the results were studied.

4.6.1 Lord's plication:

In 12 unilateral hydrocele patients Lord's plication was done. In two patients with bilateral hydrocele Lord's plication was done on both sides, and in another two patients of bilateral hydrocele Lord's plication was done on one side only. Thus the total number of hydroceles in which Lord's plication was done is 18.

4.6.2 Jaboulay's procedure:

In 12 unilateral hydrocele patients Jaboulay's procedure was done. In bilateral cases, Jaboulay's procedure was done on both sides in one case and only on one side in four cases. Thus the total number of hydroceles in which Jaboulays procedure was done is 18.

4.6.3 **Radical excision:**

This operation was done in 13 unilateral cases. In bilateral cases radical excision was done on both sides in one case and in three cases it was done on one side only. Thus the total number of hydroceles in which radical excision of sac done is 18.

4.6.4 Jhawar and Sharma technique:

This operation was done in 11 unilateral cases. In bilateral patients this procedure was done on both sides in two cases and on one side only in three cases. Thus the total number of hydroceles in which Jhawar and Sharma technique done is 18.

4.7 Post Operative Period

All the patients were given scrotal support sedation was given on the operative day. One course of antibiotics was given. Anti-inflammatory and analgesics tablets were given post operatively for 4-5 days. Wherever the corrugated rubber drain was kept, it was removed after 2-5 days. The sutures were removed in most cases between 6-9 days. The maximum number of patients were discharged between 6-10th day post-operative day in all type of patients. The patients who developed the complications stayed more.

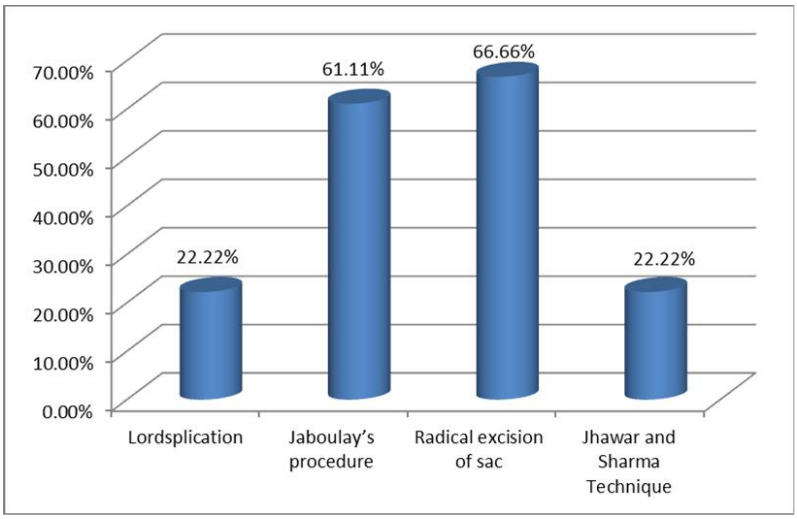
4.8 Postoperative Course And Complications:

The course and complications of four different procedures performed on 72 hydroceles were as follows.

Table-6: Postoperative course and complications

Type of operation	Pain	Fever	Haematoma	Scrotal edema	Infection	Wound disruption	Orchidectomy	Drain placed	Mean suture removal day	recurrence
Lord's plication[18]	4	-	-	3	-	-	-	2	6	-
Jaboulay's operation[18]	11	1	2	6	1	1	1	17	8	-
Radical excision of sac[18]	12	3	7	11	2	-	-	18	9	-
Sharma and Jhawartechnique[18]	4	-	-	2	-	-	-	-	6	-

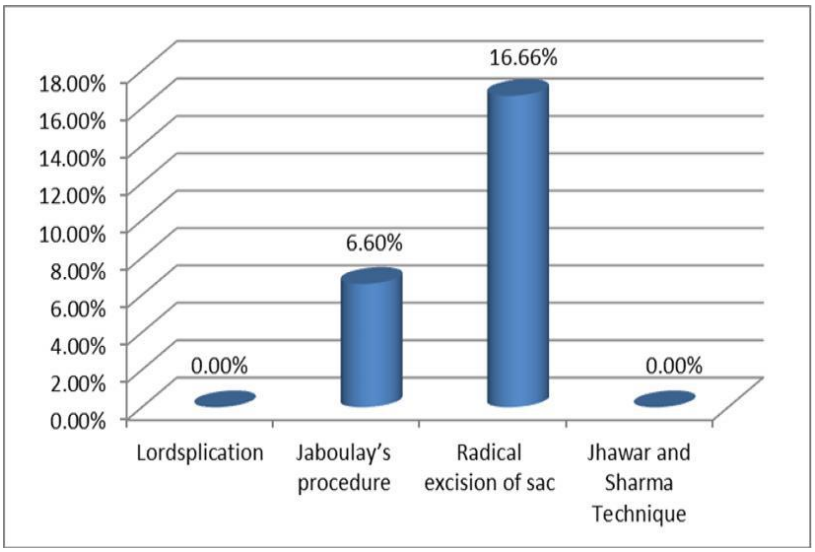
4.8.1 Pain : In Lords plication post-operative pain was present in 4 (22.22%) cases, in Jhawar and Sharma technique also its seen 4 (22.22%) cases, both of which are less when compared to Jaboulay's 11 (61.11%) cases and in radical excision of sac 12 (66.66%) cases.



Graph – 5: Pain in various operative procedures (%)

On applying chi-square test the P value is found to be 0.0049; S. This 'P value' shows that the difference in the occurrence of post-operative complication pain among the procedures is statistically significant.

4.8.2 Fever : Post operatively fever was noted in one case of Jaboulay's (6.6%) and 3 cases of radical excision of sac (16.66%) whereas no one in Lord's plication or Jhawar and Sharma technique developed fever.

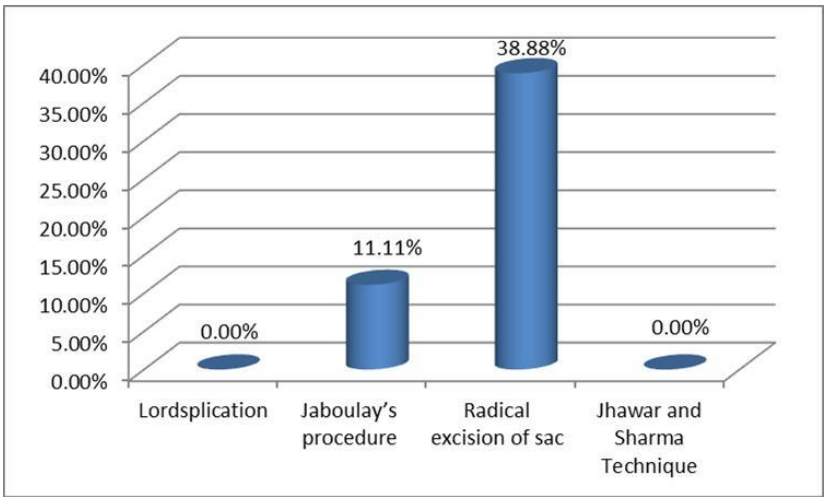


Graph – 6 Fever in various operative procedures (%)

On applying chi-square test the P value is found to be P=0.09; NS. This means that the difference in occurrence of postoperative complication fever among the four procedures is statistically nil significant.

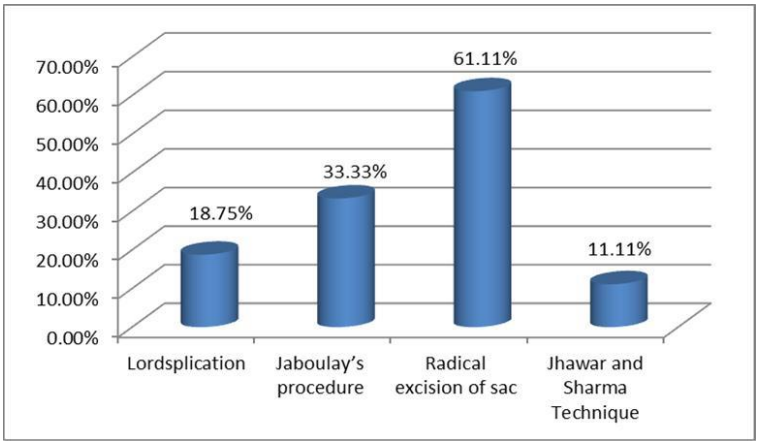
4.8.3 Haematoma: Haematoma was present only in 2 (11.11%) cases of Jaboulay's and in radical excision of sac 7 (38.88%) cases. No case of Lord's plication or Jhawar and Sharma developed haematoma.

On applying chi-square test the P value is found to be P<0.001; S. This means that the difference in occurrence of postoperative complication haematoma among the four procedures is statistically significant.



Graph – 7 Haematoma in various operative procedures (%)

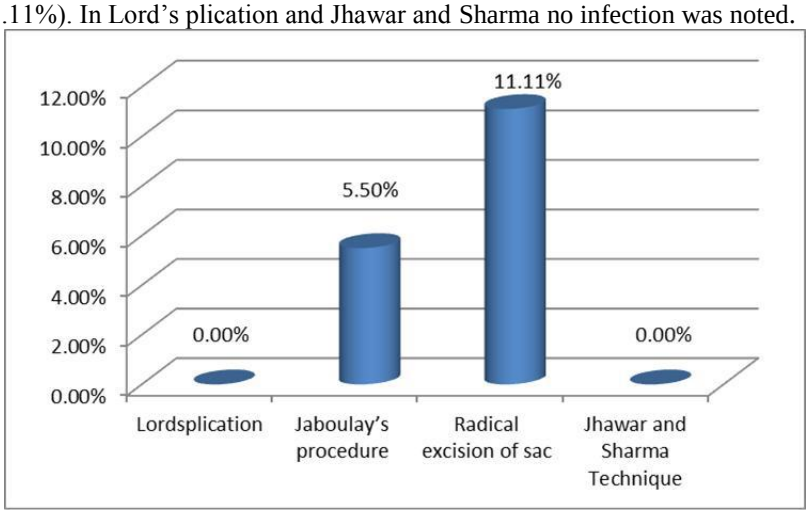
4.8.4 Scrotal oedema: Scrotal oedema developed in 3 (18.75%) cases of Lord's plication and in 6 (33.33%) cases of Jaboulay's procedure, 11 (61.11%) cases of radical excision of sac and in 2 (11.11%) cases of Jhawar & Sharma technique.



Graph - 8 Scrotal oedema in various operative procedures (%)

On applying chi-square test the P value is found to be P=0.005; S. This means that the difference in occurrence of postoperative complication scrotal oedema among the four procedures is statistically significant.

4.8.5 Infection: wound infection was noted in one case of Jaboulays (5.5%) and in two cases of radical excision of sac (11.11%). In Lord's plication and Jhawar and Sharma no infection was noted.

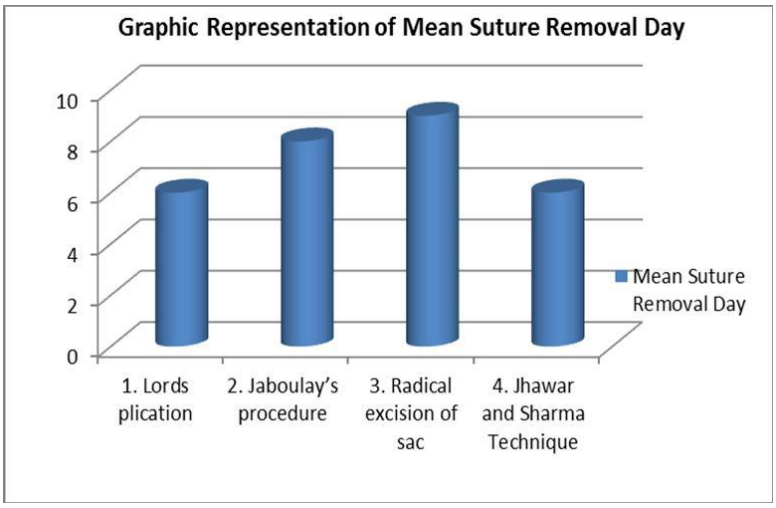


Graph – 9 Infection in various operative procedures (%)

On applying chi-square test the P value is found to be P=0.28; NS. This means that the difference in occurrence of postoperative complication infection among the four procedures is statistically nil significant.

4.8.6 Drain placement: In Lord's plication drain was placed in 2 (11.11%) cases only. In Jaboulay's procedure drain was placed in 17 (94.44%) cases out of 18cases. In radical excision of sac all 18 (100%) cases drain was placed. In Jhawar and Sharma technique drain was not placed in any case. Whenever drain was placed it was removed within 48 hours in most cases. In some cases with soakage it was continued for another 2-3 days.

4.8.7 Mean suture removal day: In case of Lord's plication sutures were removed on a mean of 6 days and in Jaboulays 8 days in radical excision of sac 9 days, in case of Jhawar and Sharma technique mean of 6 days.



Graph - 10

4.8.8 Recurrence: No recurrence was noted in any case.

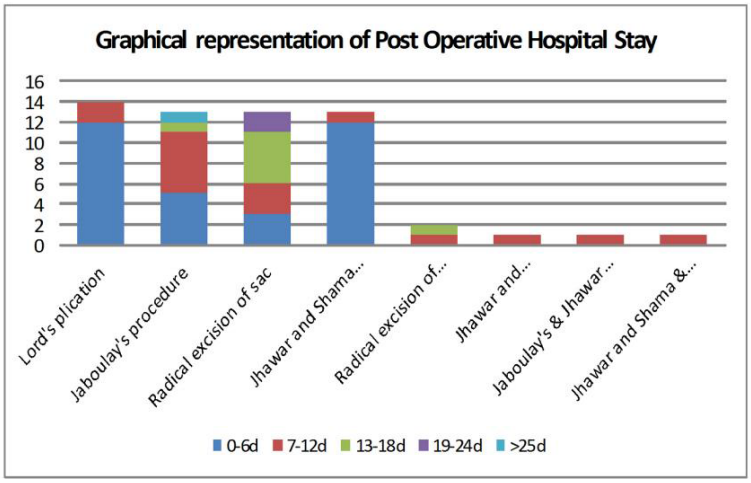
4.8.9 Orchidectomy: This was done in one case where Jaboulay's procedure was done and in the post operative period patient developed haematoma, wound infection followed by wound disruption. Later orchidectomy and secondary suturing was done in that patient.

4.8.10 Post operative hospital stay:

In our series all patients had post operative stay of 6 days. In them most of the patients who underwent Lord's procedure were discharged 6-8 days i.e. less post operative stay. And most of the patients who underwent Jhawar and Sharma technique also had less postoperative stay of 6- 8days. Whereas most of the patients who underwent Jaboulays procedure got discharged between 8-12 days. One patient who developed haematocele and wound infection stayed longer and was discharged on 28th POD. Patients who underwent radical excision of sac had more post operative stay most of them >12 days, and upto 24 days . This indicates excessive dissection lead to increased days of post operative stay.

Table 7 : Post Operative Hospital Stay

Type of operations	No.of days				
	0-6	7-12	13-18	19-24	>25
Lord's plication (14 patients)	12	2	0	0	0
Jaboulay's procedure(13 patients)	5	6	1	0	1
Ra d i c a l excision of sac (13 patients)	3	3	5	2	0
Jhawar & Sharma technique (13patients)	12	1	0	0	0
5.Lords plication and Jaboulay's(1 patient)		1			
Radical excision of sac and Jaboulay's (2 patients)		1	1		
Radical excision of sac & Jhawar and Sharma (1 patient)		1			
Jaboulay's & Jhawar and Sharma (1 patient)		1			
Jhawar and Sharma & lord's plication (1 patient)		1			



Graph - 11

V. Discussion

5.1 Age incidence

Hydrocele is found in all age groups but young adults are most commonly affected as illustrated in this study. Majority of the patients in this series belong to the age group of 21-30 years (25%). The youngest patient was 17 years old and the oldest was 78 years old man.

Table 8: Comparison of age group with other series- Series by Meredith F Campbell

Age]yrs]	No.of patients	Percentage
<6	**12**	**2.63**
6-14	**2**	**0.44**
15-19	**35**	**7.67**
20-29	**126**	**27.63**
30-39	**74**	**16.23**
40-19	**89**	**19.52**
50-59	**79**	**17.32**
60-69	**32**	**7.01**
70-79	**6**	**1.32**
81	**1**	**0.22**
Not recorded	**3**	**0.66**
Total	**456**	**100**

In Meredith F Campbell study author has quoted 90% of his patients were over 21 years of age and the condition is being most frequently observed between ages 20-30 years (27%) youngest is 6 years of age and eldest in his study is 81 years of age.

In Ku JH et al (2001)[1] most of the patients belonged to the age group of 41- 50 years. The youngest was 16 years and the oldest was 83 years.

The findings in comparison are nearer to our study.

5.2 Duration

Most of the hydrocele presented with duration of 0-6 months. There was more predilection of hydrocele to right side

Table – 9 : Comparison with Meredith F. Campbell Study

Number of cases according to Duration of disease				
Time interval	**Days**	**Weeks**	months	**Years**
1	**-**	**4**	8	**-**
2	**-**	**7**	25	**50**
3	**2**	**6**	22	**28**
4	**2**	**-**	9	**18**
5	**3**	**-**	10	**15**
6	**-**	**-**	23	**11**
7-8	**-**	**-**	15	**12**
9-10	**-**	**-**	19	**19**
11-12	**-**	**-**	19	**8**
13-17	**-**	**-**	3	**16**

18-24	-	-	15	**13**
24-40	-	-	-	**4**
60	-	-	-	**1**

In over 50 percent, the duration of the lesion was between 2 months and 2 years as per the above table. The findings in comparison are nearer to our study.

5.3 Side

Table – 10 : Comparison with Meredith F. Campbell Study

Side	No.of cases	Percentage
Right	244	51.26
Left	188	39.49
Bilateral	44	9.24
Total	476	100

There is predilection to right side in Campbell study
The findings in comparison are nearer to our study.

5.4 Presentation

The primary presenting symptom in all cases was gradually progressing painless swelling of the scrotum. About 10 patients had dragging type of pain, 8 patients had mechanical discomfort due to scrotal swelling. All the cases had routine investigations but when there is clinical suspicion of testicular tumour associated with the hydrocele scrotal ultrasound was also doneThe availability of a large number of surgical options bears testimony to the fact that no technique is fool proof. The problematic postoperative complication is scrotal haematoma, which itself leads on to other complications like infection, abscess etc. As haematoma is a fertile pabulum for bacterial growth. Hence many procedures evolved to prevent haematoma. Two such unique surgical procedures evolved decades ago are Lord's plication and Jhawar and Sharma technique. Management of hydrocele was done as described by original authors. Surgical procedures adapted were Lord's plication, Jaboulay's procedure, radical excision of sac and Jhawar and Sharma technique.

5.5 Pain

Albrecht W et al[2] (1992) carried study to compare Lord's operation with traditional surgical procedures as was the percentage of patients reporting postoperative pain (4.3 versus 15.8%). In the present study 22.22% cases developed post-operative pain who underwent Lord's procedure compared to 61.11% cases Jaboulay's procedure, to 66.66% cases in radical excision of sac and in 22.22% cases in Jhawar and Sharma technique Pain was ranging from mild degree which responded to oral analgesic to severe degrees, Which required injectable analgesics. Postoperatively few patients had complications like haematoma, scrotal oedema, infection, of which haematoma was most problematic and difficult to convince the patients.

5.6 Haematoma

Haematoma incidence in Lord's procedure and Jhawar and Sharma technique is nil compared to other conventional techniques. Most of the patients were of poor socio-economic status and this illustrates that who had maintained poor perineal hygiene, led to infection rate inspite of thorough preoperative preparation.

Haematoma was present only in Jaboulay's 11.11%, and radical excision of sac 38.88%. In case of Lord's plication and Jhawar and Sharma technique it was nil. Haematoma which occurred in few patients was managed conservatively. Few required aspiration compression bandage, antibiotics and analgesics.
The incidence of haematoma in the present series compared with others is in table below.

Lord (1964), Efron and Sharkey (1967), Dahl et al. (1972), Reddy and Srinivas (1973), Rai et al. (1978) also reported favourable results by plication as shown in the table 11. Campbell (1927) studied 502 cases by excision and quoted post-operative haematoma as 2-3% and infection rate as 15. Gangal (1964) performed radical operation in 80 cases and reported dreadful complication of postoperative haematoma, necessitating orchidectomy in one case. In study by Shah PA et al (1992) haematoma occurred in 2% of the cases following the lord's plication procedure.[3]

Table – 11: Incidence of Haematoma in various series

S.NO	AUTHOR	PROCEDURE			
		PLICATION OF SAC		EXCISION/EVERSION OF SAC	
		NO.OF CASES	HAEMATOMA	NO.OF CASES	HAEMATOMA
1	Lords (1964)	22	Nil	nil	Nil
2	Efron et al. (1967)	29	1	30	9
3	Dahl et al. (1972)	25	-	23	6
4	Reddy and Srinivas (1973)	400	Negligible	-	-
5	Rai et al. (1973)	50	-	20	15
6	Campbell (1927)	-	-	502	12
7	Present series (2010)	18	-	36	9

In the current study Lord's plication and Jhawar & Sharma technique had less haematoma when compared with eversion or excision of sac. This is explained on the basis that much dissection in not required. Hence no haematoma formation occurred which is a preclude to all other complications present with conventional methods of treatment.

Table – 12 : Incidence of infection, post-operative hospital stay, follow upand recurrence, in Lord's procedure compared with other series

Sl. No.	Author and year	No. of cases	Groin incision	Infection	Post Op. stay in days	Follow up	
						No. of cases	Duration
1	Lord (1964)	22	-	-	-	**5**	**3** years
2	Efron et al. (1967)	29	1	-	5	-	3-8 months
3	Reddy et al.	100	8	Negligible	5-6	-	2-4 years
4	Rai et al. (1973)	50	-	Nil	3-8	-	-
5	Present study 18 - - 6-8 3 2 months	18	-	-	6-8	**3**	2months

In study by Dunaevskii Iac, Gorokhov ME (1990) analysed the results of the surgical treatment of 167 patients with hydrocele who were operated on with the use of Winkelmann's or Bergmann's technique (group I), the same but modified by Grebenshikov-Shevtsov's (group II), and Lord's method (group III). A high percentage of complications was associated with Winklemann and Bergmann's techniques (scrotal edema, haematoma, wound infection) when the hydropic sac was isolated from the adjacent tissues. Analysis of 42 surgeons performed with

Lord's method which avoided the isolation of hydropic sac from the adjacent tissues demonstrated its efficacy and simplicity. No haematomas, suppurations or relapses were documented.[4] Out of all surgical procedures Lords plication procedure and Jhawar and Sharma technique were unique in not leading to haematoma in this study and also by various authors, which has been already established.

5.7 Scrotal oedema

In the present study Lord's procedure was performed in 18 patients scrotal oedema developed in 3 cases 16.66%. No recurrence was noted. Singh DR et al (1996) performed a study on Lord's procedures in 26 patients as outpatient operation. Postoperative complications were negligible except for the scrotal oedema in 3 (11.53%) cases. No recurrence was noted till one year follow up.[5] Scrotal edema occurred not only due to infection but also due to dissection and breakage of lymphatics. Scrotal oedema was more in Jaboulay's procedure 33.33% cases and radical excision 61.11% and least in the Lord's plication 16.66% and Jhawar and Sharma technique 11.11%. Post operatively patients were given antibiotics, anti-inflammatory analgesics and scrotal support.

5.8 Disruption of wound

No case of disruption of wound occurred in Lord's plication as compared to one patient with Jaboulay's procedure in whom disruption was noted and later orchidectomy was done in that case. Most complications like infections, scrotal oedema or haematoma were commonly noticed in procedures, which had

extensive, dissections. Dissection of the sac wall leads to breakage or tearing of anastomotic vessels leading to bleeding and haematoma, scrotal edema. It was more with Jaboulay's procedure and radical excision of the sac. Excision of the non absorbing parietal layer of the tunica is essential to prevent recurrence. Dissection of the sac wall leads to tearing of the vessels leading to bleed and haematoma. So recent techniques have been evolved for minimal incision, minimal dissection hence less chance of haematoma or scrotal edema. So dissection of hydrocele sac only adds morbidity hence Lord's procedure and Jhawar and Sharma techniques which include minimal dissection has nil haematoma incidence and also decreased complication rate in our study. Hencedecreased postoperative stay compared to other surgical modalities and decreased cost incurred for patients.

In present study of 60 patients with primary vaginal hydrocele 18 hydroceles were operated by Jaboulay's procedure and 18 patients by radical excision both of these groups of patients had higher complication rates with complications like haematoma, suppuration when compared to 18 patients who had Lord's plication and18 patients who had undergone Jhawar and Sharma technique. Most surgical patients had postoperative study of 6-10 days. Those who had extensive dissection as in Jaboulay's procedure and radical excision of sac had increased complications, hence prolonged stay and increased cost expenditure. About 87.5% patients who had Lord's plication were discharged within one week and all 100% patients who underwent Jhawar and Sharma technique were discharged within one week.

Lord's procedure is the gold standard surgery for the primary vaginal hydrocele compared to other conventional procedures because Lord's procedure is much easier and simpler in technique, consumed less time, and it can be done through a small incision. As the sac is not stripped from the surrounding scrotal tissues, bleeding is minimal, post- operative haematoma does not occur and consequently other complications like. pain, fever, infection, disruption of wound etc can be prevented.

Jhawar and Sharma technique is also a very good technique similar to Lord's plication because it also involves less dissection small incision and hence bleeding is minimal. Post-operative haematoma also does not occur and consequently all complications like pain, fever, infection, wound disruption etc., can be prevented.

VI. Summary

This study consists of operative treatment of primary vaginal hydrocele by various surgical techniques like Lord's plication, Jaboulay's procedure, radical excision of sac and Jhawar and Sharma technique for the period of 24 months from October 2010 to October 2012. There were 168 cases of hydrocele during this period, with limitation of armamentarium or investigations, the diagnosis was mainly based on clinical grounds. An effort was made to study etiology, pathophysiology, signs and symptoms and evaluation of various surgical procedures of hydrocele.

The study imparts systematic analysis of the materials of the present study. Standard observation available on the subject is limited and hence comparison have been made whenever possible.

The results were analysed from the present study and summarized.

1. A total number of 168 cases of primary vaginal hydrocele were admitted out of which 60 cases were studied in this series
2. Age of the patient varied from seventeen years to seventy eight old. Maximum incidence was found in 3rd decade.
3. Higher incidence was found in the agriculturist and coolies specially, those belonging to poor socioeconomic class.
4. The maximum number of cases presented within 6 months and minimum number above 10 years.
5. Scrotal swelling was commonest presentation. A few patients presented with heaviness of scrotum and dull dragging type of pain. No patients presented with difficulty in walking or sexual act.
6. Local examination revealed with classical signs of hydrocele that is positive for fluctuation and transillumination.
7. Right sided hydroceles were more common.
8. General examination revealed nothing of significance.
9. Routine investigations were done in all cases and investigation like scrotal ultrasound was done in cases where there is a clinical suspicion of testicular tumour.
10. Different surgical techniques like Lord's plication (18 hydroceles), Jaboulay's procedure (18 hydroceles) radical excision of sac (18 hydroceles), Jhawar and Sharma technique (18 hydroceles) were performed to treat the cases.

The study showed Lord's plication and Jhawar and Sharma technique to be superior to other techniques in the treatment of primary vaginal hydrocele, in terms of incidence of post- operative complications, simplicity of the procedure and less morbidity of the patients.

VII. Conclusion

Lord's plication, Jhawar and Sharma techniques in comparison to conventional methods are much easier and simpler in technique, consume less time. They can be done through a small incision and as the sac is not stripped from the surrounding scrotal tissues, cause minimal bleeding, postoperative haematoma does not occur and consequently disruption of wound etc., can be prevented.

In this brief study we have tried to compare various surgical procedures of hydrocele like Lord's plication, Jaboulay's procedure, Radical excision of sac and Jhawar and Sharma technique. we found that both Lord's plication, Jhawar and Sharma techniques to be superior to other techniques if the hydrocele is of small to moderate size. But in case of large hydrocele with thickened and calcified sac radical excision is the best choice. weare fully aware that 72 cases is too small a number to draw any definite conclusions. The follow up too has been short but under prevailing circumstances, we have made an attempt to do our best.

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