e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(1); 1070-1074

Original Research Article

A Study on Comparison of Minimal Separation Hydrocelectomy vs. Conventional Hydrocelectomy (Jaboulay's Procedure)

A. Santhi[1*], S. Umarani[2], S. Chelladurai[3]

[1]Assistant Professor, Department of General Surgery, Government Omandurar Medical College, Chennai

[2]Associate Professor, Department of General Surgery, Government Omandurar Medical College, Chennai

[3]Assistant Professor, Department of General Surgery, Government Omandurar Medical College, Chennai

Received: 25-10-2023 / Revised: 23-11-2023 / Accepted: 26-12-2023

Corresponding Author: Dr. A. Santhi

Conflict of interest: Nil

Abstract:

Background: To compare the new minimally access hydrocelectomy versus Jaboulay's procedure regarding operative outcome and patient's satisfaction. Minimal access hydrocelectomy surgery is a novel procedure and there is an adequate literature about the benefits of this surgical technique. In India, still in many hospitals we are practicing only conventional hydrocelectomy (Jaboulay's procedure) and Lord's plication techniques for the treatment of hydrocele. These techniques have its own complications. Based on this aim of our study is to compare the operative outcomes among the primary vaginal hydrocele patients those underwent minimal access hydrocelectomy and conventional hydrocelectomy and also to compare the operating time and hospital stay among the primary vaginal hydrocele patients those underwent minimal access hydrocelectomy and conventional hydrocelectomy.

Materials and Methods: A total of 60 adult patients were divided into two groups A and B. Group A patients was subjected to conventional surgical hydrocelectomy (Jaboulay's procedure) and group B patients were subjected to the new minimal access hydrocelectomy. A questionnaire was designed which contained the details of patient's name, age, sex, symptoms or presenting complaints, duration of the swelling, site of the swelling, operating time in minutes, post-operative complications if any and duration of the hospital stay in hours.

Results: In our study group among conventional hydrocelectomy patients, 93% of the patients presented with post-operative complications. Only 7% had no post-operative complications. Only 10% of the study participants underwent minimal separation hydrocelectomy presented with edema and hardening and only 7% presented with wound infection. The difference in the operative time was statistically significant mean operating time in conventional hydrocelectomy (30.83 minutes) than minimal separation hydrocelectomy (17.93 minutes) .Same was with hospital stay conventional hydrocelectomy (80.50 hours) more than minimal separation hydrocelectomy (48.57 hours).

Conclusion: Hydrocelectomy is considered the gold standard technique for the treatment of hydrocele and the minimally access maneuvers provide the best operative outcomes regarding scrotal edema and hardening and patient's satisfaction when compared to conventional eversion-excision hydrocelectomies.

Keywords: Minimally Invasive Surgical Procedures; complications; Testicular Hydrocele.

Introduction

Hydrocele is an abnormal collection of serous fluid in a part of the processes vaginalis, generally the tunica. Hydrocele is the most common benign swelling of the scrotum. The occurrences of hydrocele are estimated as 1% among the adult male population. "Primary vaginal hydrocele is well-defined as abnormal accumulation of serous fluid in tunica vaginalis." Secondary hydrocele occur subordinate to disease of the testes and epididymis and its management mainly comprises of treatment of the underlying cause. Filarial hydrocele and chylocoele account for 80% of hydrocele in some humid countries where the parasite, Wuchereria Bancrofti, is endemic. [1] Hydrocele is very common appearance in tropical countries especially where filariasis is dominant. In India the highest incidence is seen along the coastal belt where the filariasis is common. Aspiration and sclerotherapy with doxycycline are the main nonsurgical treatment option for the hydrocele. [2]

Aspiration and injection of sclerosant can cause severe pain, and simple aspiration has to be recurrent and carries risk of infection and hematoma formation. Hydrocelectomy remains the treatment of choice for the management of hydroceles. Surgery has been the normal and traditional treatment of choice for hydrocele and which is relatively simple and usually known. [3]

Surgical treatment of idiopathic hydrocele comprises basic techniques–Winkelmann's partial excision, Lord's plication and eversion of the sac. Jaboulay's eversion of the sac and radical excision of the sac. Congenital hydrocoele is treated by herniotomy. The most common surgical procedures for the hydrocele are Lord's plication and Jaboulay's procedure. The technique, devised by Lord and it may also apply to repair a hydrocele, and it is quick and relative bloodless since the sac is not dissected. These operations are minor surgical procedures and that can be performed in an out-patient setup with the success rate of 80% to 98%. [4-6]

Hydrocelectomy through the eversion procedures for hydrocele may cause postoperative discomfort and temporary limitations of normal activities. Also the complications such as persistent swelling, hematoma, infection, chronic pain and decreased fertility. Complications arises in the following procedures include infection, hematoma formation, persistent swelling or recurrence of the hydrocele and chronic pain. Although hydrocelectomy and spermatocelectomy are done commonly in general urological practices, there is a definite insufficiency of knowledge describing the complication rates for these operations in the peer reviewed literature. Therefore we followed all the hydrocele surgeries done in our hospital to well capture of the incidence of complications following these procedures. [7,8]

Since this information appears to be under this reported in the previous and current literature. However, now days there are few prospective studies comparing the results of the various surgical techniques. Minimal access hydrocelectomy surgery is a novel procedure and there is an adequate literature about the benefits of this surgical technique. In India, still in many hospitals we are practicing only conventional hydrocelectomy (Jaboulay's procedure) and Lord's plication techniques for the treatment of hydrocele. These techniques have its own complications. Only a very few publications have studied the benefits of minimal access hydrocelectomy over the conventional procedure and there were no studies which involved Indian population. [9-11]

Based on this aim of our study is to compare the operative outcomes among the primary vaginal hydrocele patients those underwent minimal access hydrocelectomy and conventional hydrocelectomy and also to compare the operating time and hospital stay among the primary vaginal hydrocele patients those underwent minimal access hydrocelectomy and conventional hydrocelectomy.

Materials and Methods

This study was done at Department of General Surgery, Govt. Omandurar Medical College, Chennai. For period of 6 months among patients attended the surgery OPD with scrotal swelling for evaluation. Those subjects diagnosed as primary vaginal hydrocele and willing for the surgery in age group 18-56 years in males were included in study whereas those patients presented with spermatocele, testicular malignancies and scrotal hematocele and having filarial scrotum requiring scrotoplasty were not included in this study.

The study is conducted as a single blinded Randomized Control Trial with two arms – one arm of subjects with hydrocele who underwent minimal separation hydrocelectomy and the other arm of subjects with hydrocele who underwent conventional hydrocelectomy (Jaboulay's procedure). The total sample size estimated is 60 with 30 subjects in each arm.

The randomization technique was commenced before the start of the procedure. There was 60 sealed envelopes were made ready with sequential number from 1 to 60. Each envelope contained a computer generated random number inside in it. Based on the random number, the subjects were allocated and the respective surgeries were done.

Each patient was assessed in detail about their history and complete physical examination was done. Fluctuation and Trans-illumination was used for confirming the diagnosis of hydrocele. Basic laboratory investigations like complete blood count and urine routine examinations were done. USG Scrotum was done in all patients. Inj. ceftriaxone 1gm IV at the time of induction of anesthesia or just after the administration of spinal anesthesia was given followed by another dose 2 h postoperatively.

After the induction of spinal anesthesia, antibiotic ceftriaxone 1gm iv was given intravenously followed by one more dose 2 hours post-operatively. The testis was delivered through an incision in the scrotum and the tunica was opened and everted and most of the hydrocele sac was resected with electrocautery and leaving a reasonable cuff along the borders of the testicle. Bleeding was controlled by a running suture closing the free edges of the hydrocele sac and homeostasis was secured by the aid of electrocautery. Standard 2 layer closure which was used to close the scrotum with small tube drain. Patients were followed up on second day for scrotal

edema and hematoma and the drain was removed on third day. Minimal Separation Hydrocelectomy procedure was done as follows- A small scrotal incision of about 2cm long was made and incision of the Dartos muscles in the same line was made using with electro cautery. The parietal tunica vaginalis (PTV) was identified grasped and minimal blunt dissection was made by the help of the index finger. A small hole was made for the aspiration of hydrocele fluid. Then a disc of tissue was excised of the parietal tunica vaginalis about double of the skin incision dimension using electrocautery. The edge of the visceral surface of the tunica vaginalis was sutured to the parietal layer of the tunica vaginalis and then to the Dartos muscle and all was sutured to scrotal skin in an everted manner aim to expose the visceral tunica toward scrotal skin. If the visceral surface of the tunica vaginalis is sutured to the Dartos, eversion will be created. Then when this everted structure is sutured to the scrotal skin, it will be in contact the sac with lymph-rich subcutaneous tissues. A drain was kept in place and discharge was allowed for one day. Patients were followed up on second day for scrotal edema and hematoma and the drain was removed on same day.

A questionnaire was designed which contained the details of patient's name, age, sex, symptoms or presenting complaints, duration of the swelling, site of the swelling, operating time in minutes, post-operative complications if any and duration of the hospital stay in hours.

Continuous variables were presented in the form of descriptive statistics (mean and standard deviation) and categorical variables in the form of frequency distributions and percentages. Association between categorical variables is tested using Chi square tests and Fisher exact tests. Association between continuous variables and a grouping variable were tested using student't' test. SPSS Version 24 was used for analysis.

Results

In our study population of 60 patients most commonly 18 patients were in 41-50 age group and 15 patients in 51-60 age group. There was not much difference between surgical methods. The difference in the distribution of study participants in the both groups was statistically insignificant.

The presentation of symptoms of the patients is almost equal in both groups of the study population and the difference in the distribution is statistically insignificant. Most commonly it was painless scrotal swelling, few cases has discomfort in scrotal region

The presentation of side of hydrocele of patients in the both groups had no much difference with right side (n=27) more common followed by left side (n=24) and a few by both sides (n=9). The difference in the distribution is statistically insignificant.

The mean duration of hydrocele of patients in the both groups of the study population had only a mild difference which was not statistically significant. The range of duration of hydrocele was 16 years (1 to 17 years) in both the study groups.

In our study population among conventional hydrocelectomy patients, 93% of the patients presented with edema and hardening out of which 33% also presented with wound infection and 3% also presented with hematoma. Only 7% had no post-operative complications. Only 10% of the study participants underwent minimal separation hydrocelectomy presented with edema and hardening and only 7% presented with wound infection. 83% of the patients didn't experience any post-operative complications. The difference in the distribution of edema and hardening among the patients in the two study groups was statistically significant.

Table 1: Distribution of post-operative complications

Postop Complications	Procedure		Total	Fisher exact p value
	Conventional Hydrocelectomy	Hydrocelectomy with Minimal Separation		
Edema and Hardening	17 (56.7%)	3 (10%)	20 (100%)	<0.001
Edema and Hardening with Wound Infection	2 (6.7%)	0 (0%)	2 (100%)	0.246
Edema and Hardening with Hematoma	1 (3.3%)	0 (0%)	1 (100%)	0.5
Wound Infection	0 (0%)	2 (6.7%)	2 (100%)	0.246

Taking into account, the overall post-operative complications suffered by the patients in both groups of the study population, the conventional hydrocelectomy group had more incidences of post-operative complications.

Around 67% of the patients belonged to conventional hydrocelectomy group of the study population suffered complications whereas only 17% of the patients belonged to minimal separation hydrocelectomy group suffered complications.

The difference in the distribution of operative time of the patients underwent two different surgical procedures were statistically significant with higher mean operating time in conventional hydrocelec-

tomy (30.83 minutes) than minimal separation hydrocelectomy (17.93 minutes).

Table 2: Distribution of time of hospital stay (in hours) of the patients in the two groups

Variable	Group	Mean	SD	P Value
Hospital Stay (Hours)	Conventional Hydrocelectomy	80.50	13.45	0.0001
	Hydrocelectomy with Minimal Separation	48.57	21.19	

The difference in the distribution of time of hospital stay of the patients underwent two different surgical procedures was statistically significant with higher mean time of hospital stay in conventional hydrocelectomy (80.50 hours) than minimal separation hydrocelectomy (48.57 hours) .

Discussion

The mean age of the participants in the study population was 47.7 ± 14.15 years with a minimum of 21 years to a maximum of 80 years. This age distribution was almost close to the Saber study which was included participants from 18 to 56 years with a mean of 37 ± 11.4 years. The mean operating time among those patients who underwent conventional hydrocelectomy was 30.83 ± 2.9 minutes with the range of 25 to 35 minutes and those who underwent the Minimal separation hydrocelectomy was 17.93 ± 1.28 minutes with a range of 15 to 20 minutes. The difference in the mean time between the two surgical procedures was statistically significant ($p < 0.01$). Similarly in Saber study, the operating time for conventional hydrocelectomy was slightly higher with mean of 32.5 ± 4.76 minutes up to a maximum of 40 minutes and the operating time for minimal access hydrocelectomy was slightly lower with mean of 15.1 ± 4.24 minutes with a range of 12 to 18 minutes. The difference in mean operating time between the two procedures was statistically significant ($p < 0.02$).

The mean time of hospital stay among the patients who underwent conventional hydrocelectomy was 80.5 ± 13.45 hours with a range of 48 to 98 hours and those who underwent Minimal access hydrocelectomy was 48.57 ± 21.19 hours with a range of 25 to 95 hours. The difference in the mean time between the two surgical procedures was statistically significant ($p < 0.01$). In Saber study, the mean time of hospital stay for conventional hydrocelectomy was lower with mean of 21.19 ± 11.65 hours with a range of 12 to 48 hours and the mean time of hospital stay for minimal access hydrocelectomy was lower with mean of 13.48 ± 6.38 hours with a range of 10 to 30 hours. But the difference in the above mean time of hospital stay between two procedures was not statistically significant ($p > 0.05$). This could be attributed to the geographical differences in the protocol management of the cases in the hospital. The differences may be due to available resources and sufficient health care providers.

The overall complication rate (percentage of patients experienced any complication) among the patients underwent conventional hydrocelectomy was 66.6% whereas it was very low among patients underwent minimal separation hydrocelectomy of 16.6% and the difference in this distribution was statistically significant ($p<0.001$).

The low complication rate among the minimal separation group was supported by the Schwartz study which states an overall complication rate among patients underwent minimal access hydrocelectomy was 12.7% and also showed a statistically significant difference from the complication rate among patients underwent conventional hydrocelectomy (37%). [12-14] The most common complication of the patients undergoing hydrocelectomy is edema and hardening. In the present study, 57% of the patients who underwent conventional hydrocelectomy suffered from edema and hardening over the surgical site post-operatively compared to 10% incidence in the patients who underwent minimal separation hydrocelectomy.

This difference in the distribution was also statistically significant. This is additive to the evidence produced by Saber study which also showed a significant difference in the distribution of edema and hardening among the patients between conventional hydrocelectomy (25%) and minimal access hydrocelectomy (5%). The next common complication following hydrocelectomy is hematoma over the surgical site. Only 3% of the patients who underwent conventional hydrocelectomy had incidence of hematoma whereas there was no incidence of hematoma in patients underwent minimal separation hydrocelectomy. In the Saber study also there was zero incidence of the hematoma in patients who underwent minimal access hydrocelcetomy. [15-17]

Edema and hematoma are the most common in excision and eversion technique (conventional hydrocelectomy). This is because of wide dissection and excessive handling of the hydrocele sac during the surgery. In the minimal separation hydrocelectomy a disc of the hydrocele sac is pulled and resected through a small scrotal incision with minimal dissection. The other complications following hydrocelcetomy are wound infection which is very negligent among both groups of patients. This was similar to previous studies. [18,19].

Conclusion

From our study it can be concluded that both the procedures are safe in both experienced and young surgeon hands. So far as post-operative hematoma, fever, scrotal edema and attainment of normal size

of scrotum is concerned both the procedures are comparable. However compared to conventional procedure, Minimal access procedure has a shorter duration of surgery, less post-operative pain and a significant shorter duration of post-operative hospital stay.

References

1. Christopher Fowler. The Testes and Scrotum. Chapter 79. In: Bailey and Love's Short Practice of Surgery, Norman S Williams, Christopher J K Bulstrode, P Ronan O Connell. 25th Edition, London: Arnold publishers 2008; 1377-1416.
2. Mihmanli I, Kantarci F, Kulaksizoglu H, Gurses B, Ogut G, Unluer E, et al. Testicular size and vascular resistance before and after hydrocelectomy. AJR Am J Roentgenol. 2004; 183:1379-85.
3. Agbakwuru EA, Salako AA, Olajide AO, Takure AO, Eziyi AK. Hydrocelectomy under local anaesthesia in a Nigerian adult population. Afr Health Sci. 2008; 8:160-2.
4. Ku JH. The Excision, Plication and Internal drainage techniques-a comparison of the results for idiopathic Hydrocoele. British Journal of Urology International 2001; 87:82-84.
5. Rodriguez WC, Rodriguez DD. The operative treatment for hydrocoele - A comparison of 4 basic techniques. Journal of Urology 1981; 125:804-805.
6. Lord PH. A Bloodless operation for the radical cure of idiopathic hydrocoele. British Journal of Surgery 1964; 51:914-916.
7. Miroglu, C., Tokuc, R. and Saporta, L.: Comparison of an extrusion procedure and eversion procedures in the treatment of hydrocele. Int Urol Nephrol, 26: 673, 1994
8. Kiddoo DA, Wollin TA, Mador DR. A population based assessment of complications following outpatient hydrocelectomy and spermatocelectomy. J Urol. 2004; 171:746-8.
9. Onol SY, Ilbey YO, Onol FF, Ozbek E, Arslan B, Akbaş A. A novel pull-through technique for the surgical management of idiopathic hydrocele. J Urol. 2009; 181:1201-5.
10. Khaniya S, Agrawal CS, Koirala R, Regmi R, Adhikary S. Comparison of aspiration-sclerotherapy with hydrocelectomy in the management of hydrocele: a prospective randomized study. International Journal of Surgery. 2009 Dec 31; 7(4):392-5.
11. Onol SY, Ilbey YO, Onol FF, Ozbek E, Arslan B, Akbaş A. A novel pull-through technique for the surgical management of idiopathic hydrocele. J Urol. 2009; 181:1201-5.
12. Rioja J, Sanchez-Margallo FM, Uson J, Rioja LA. Adult hydrocele and spermatocele. BJU Int. 2011; 107:1852-64.
13. Lasheen A. Hydrocelectomy through the inguinal approach versus scrotal approach for idiopathic hydrocele in adults. J Arab Soc Med Res. 2012; 7:68–72.
14. Cimador M, Castagnetti M, De Grazia E. Management of hydrocele in adolescente patients. Nat Rev Urol. 2010; 7:379- 85.
15. 15 Shan CJ, Lucon AM, Arap S. Comparative study of sclerotherapy with phenol and surgical treatment for hydrocele. J Urol. 2003; 169:1056-9.
16. 16. Swartz MA, Morgan TM, Krieger JN. Complications of scrotal surgery for benign conditions. Urology. 2007; 69:616-9.
17. Thomas G, Richards FO Jr, Eigege A, Dakum NK, Azzuwut MP, Sarki J, et al. A pilot program of mass surgery weeks for treatment of hydrocele due to lymphatic filariasis in central Nigeria. Am J Trop Med Hyg. 2009; 80:447-51.
18. Camacho FT, Feldman SR, Balkrishnan R, Kong MC, Anderson RT. Validation and reliability of 2 specialty care satisfaction scales. Am J Med Qual. 2009; 24:12-8.
19. Francis JJ, Levine LA. Aspiration and sclerotherapy: a nonsurgical treatment option for hydroceles. J Urol. 2013; 189:1725-9.