

Hydrocelectomy through Inguinal Approach in Adults

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ABSTRACT

Background: hydrocele is the most common cause of painless scrotal swelling. The incidence in adult males is approximately 1%, although prevalence varies according to country.

Objective: to compare between the two groups? as regards the volume of the hydrocele sac, operative time, postoperative morbidity, length of hospital stay, and time of return to daily life.

Patients and Methods: this prospective study was conducted on 40 patients with a diagnosis of unilateral (idiopathic) primary vaginal hydrocele during the period from October 2010 to October 2011. All patients were admitted to the Department of General Surgery, El-Hussein University Hospital, and underwent hydrocelectomy.

Results: the age of the patients in the inguinal approach group ranged from 17 to 52 years (mean 30.75 ± 10.67), whereas the patients included in the scrotal approach group had an age range of 16–48 years (mean 29.35 ± 8.93). The difference in mean age between the two groups was statistically insignificant. The mean volume of the hydrocele sac was 196 ± 30.28 ml (range, 155–250 ml) in the inguinal approach group and 197.75 ± 26.72 ml (range, 150–260 ml) in the scrotal approach group. The difference in mean volume of hydrocele between the two groups was statistically not significant.

Conclusion: hydrocelectomy using the inguinal approach in adults is associated with low or no postoperative morbidity, no discomfort, short hospital stay, and early return to normal life. It is easily applied and allows management of any associated lesions in the inguinal canal.

Keywords: Hydrocelectomy, Vaginalis, Adults.

INTRODUCTION

A hydrocele testis is a pathological accumulation of serous fluid between the layers of the tunica vaginalis that occurs when production of fluid by the vaginal tunic increased or resorption is decreased. Hydroceles are described in several domestic mammals and also in humans, appearing unilaterally or bilaterally as variable degrees of fluid enlargement of the scrotum without pain ⁽¹⁾.

Etiologically, this entity is categorized as congenital or acquired. Congenital hydrocele which results from a communication between the tunical and peritoneal cavities due to a patent processus vaginalis usually resolves by 18–24 months ⁽²⁾.

While acquired hydrocele is usually idiopathic in origin and it can occur at any time in adult life. The exact mechanism of idiopathic hydrocele formation is not known. Factors such as increased serous fluid secretion, lack of efferent lymphatics, and inadequate reabsorption of fluid secreted by the mesothelium are possible explanations ⁽³⁾.

Origins other than idiopathic causes are infection, infarction, torsion, tumors, radiotherapy, tuberculosis, or filariasis ⁽⁴⁾.

AIM OF THE WORK

A comparison was made between the two groups as regards the volume of the hydrocele sac, operative time, postoperative morbidity, length of hospital stay, and time of return to daily life.

PATIENTS AND METHODS:

This prospective study was conducted on 40 patients who presented to the El-Hussein University Hospital with idiopathic hydrocele and underwent hydrocelectomy. These patients were divided into two groups: group I (inguinal approach group) included 20 patients with a mean age of 30.75 ± 10.76 years and who underwent hydrocelectomy through the inguinal approach, group II (scrotal approach group) included 20 patients with a mean age of 29.35 ± 8.93 years and who underwent hydrocelectomy through the scrotal approach. A comparison was made between the two groups as regards the volume of the hydrocele sac, operative time, postoperative morbidity, length of hospital stay, and time of return to daily life.

All patients subjected to the following:

- 1- History taking.
- 2- Clinical examination:

Each patient of the 40 hydrocele cases was clinically examined by a general physical examination for pulse, temperature, blood pressure. This was followed by proper examination of the genitalia including: examination of the penis; including the location of the urethral meatus; palpation of the testes and measurement of their size; presence and consistency of both the vasa and epididymis; presence of a varicocele.

- 3- Scrotal ultrasonography:

Testicular blood flow dynamics evaluated using color Doppler ultrasonography to assess blood flow before and after surgical excision of hydrocele.

Images with B mode ultrasound were acquired in the longitudinal and transverse planes.

The testicular length was measured on the longitudinal view while the antero-posterior (AP) and transverse diameters (T) were measured on the transverse view. All the scans were performed by the radiologist. Testis size was calculated using the formula as follow:

$$\text{Testicular volume (Testis Size)} = \text{Length} \times \text{AP} \times \text{T} \times 0.71.$$

4- Clinical pathology investigations:

In order to select the proper candidate for forth coming operation a complete blood count (CBC), kidney, liver, and blood sugar tests performed before the procedure.

5- Written Informed consent:

An approval of the study was obtained from Al- Azhar University Academic and Ethical Committee. Every patient signed an informed written consent for acceptance of the operation.

Preoperative Patient Preparation:

All patients were positioned in supine position before General, spinal or local anesthesia. Perioperative antibiotic injected as a prophylaxis to avoid the risk factors for wound infection. Complete shaving and washing of the scrotum and inguinal region followed by povidine iodide (Betadine™) disinfection.

Antibiotic prophylaxis and Anesthesia: Ceftriaxone 1gm IV preoperative was given. Operation was done under spinal anesthesia.

Surgical Approach for Hydrocelectomy:

Group I: Inguinal approach.

In each operated patient, scrotal exposure was necessary followed by an incision in the inguinal area just at the level of external inguinal ring, delivery of the cord then pushing up the testis and hydrocele cephalic, aspiration of the hydrocele to reduce the mass size can be done using 10cm syringe then evacuation of the hydrocele and resection of the tunica vaginalis (**Fig. 1**). Most of the hydrocele sac was resected with electrocautery, leaving a reasonable cuff along the borders of the testicle. The tunica was opened and everted. Care was taken not to injure testicular vessels, epididymis or ductus deferens. Approximation of the edges is done loosely around the cord to avoid compromising the blood supply of the testicle. The edges of the hydrocele sac were sewn together behind the spermatic cord after being everted (**Fig.2**). Electrocautery was used around the edge to aid hemostasis in some of the operated patients. The testis returned back into the scrotum (**Fig. 3-5**) then, standard two-layer closure is used to close the scrotum with Vac drain insertion (**Fig. 6-7**).



Figure (1): Large right sided hydrocele.

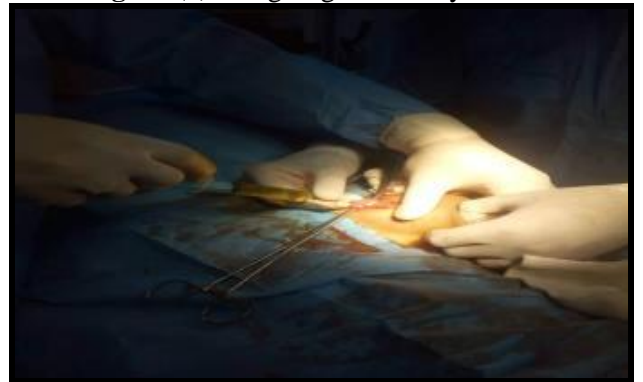


Figure (2): Aspiration through inguinal incision to decrease the size that facilitates the delivery of the hydrocele sac.



Figure (3): Easily delivered hydrocele.



Figure (4): Opening the sac.



Figure (5): Evacuation of the sac.



Figure (6): Excision and eversion of the tunica.

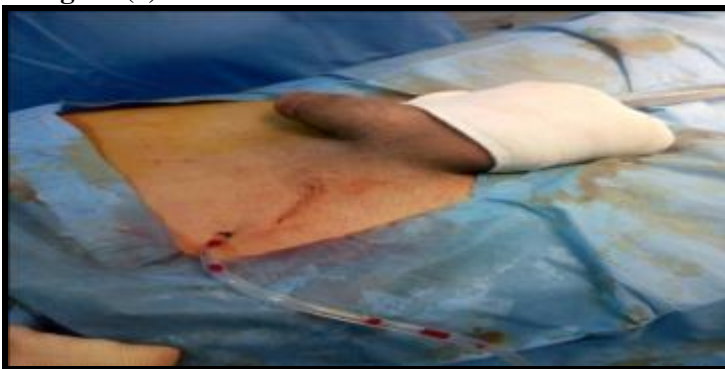


Figure (7): Closure of the incision after drain insertion.

Group II: Scrotal approach:

Scrotal exposure was necessary followed by an incision in the tunica vaginalis. After delivering the testis through the incision, evacuation of the hydrocele fluid was performed. Most of the hydrocele sac was resected with electrocautery, leaving a reasonable cuff along the borders of the testicle. The tunica was opened and everted. Care was taken not to injure testicular vessels, epididymis or ductus deferens.

All the 40 patients were operated in the same way, small tube drain inserted in the scrotal wound for about one week interval till the fluid being completely drained. Early or late removal was pending on the fluid drained through the drain tube.

Operative notes were recorded including, intraoperative complications, operative time,

postoperative complications and amount of daily drain output and time of drain removal in each group.

A comparison was made between the two groups as regard; operative time, postoperative hematoma, seroma formation and wound sepsis, length of hospital stay and time of return to daily life.

Data collection sheets were filled in by the investigator himself, these sheets included; each patient age, height and weight, any earlier surgical or medical problems, clinical pathology investigations, operative time, postoperative hematoma, seroma formation, wound sepsis, length of hospital stay, time of return to daily life, time of drain removal in group I, follow-ups (after 2 weeks, 1 month, 2 months and 3 months intervals) and recurrence of hydrocele.

During the postoperative period all the patients were monitored every day for five days for scrotal swellings or discharge and infection. Patients were followed up postoperatively at 2 weeks, 1 month, 2 months and 3 months intervals.

Statistical analysis:

Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

The following tests were done:

- Independent-samples t-test of significance was used when comparing between two means.
- Chi-square (χ^2) test of significance was used in order to compare proportions between two qualitative parameters.
- The confidence interval was set to 95% and the margin of error accepted was set to 5%. The p-value was considered significant as the following:
 - Probability (P-value):
 - P-value <0.05 was considered significant.
 - P-value <0.001 was considered as highly significant.
 - P-value >0.05 was considered insignificant.

RESULTS

Table (1): Classification of patients according to age:

	Number (No.)	Mean ±SD	T Value
Group I	20	38.10±10.90	0.572
Group II	20	36.10±11.20	

Table (4) shows that the mean age was 38.10 years in group I and 36.10 years in group II and there was no statistically significant difference between both groups as regard the age, since T value

> 0.05.

Table (2): Patients age groups in our study:

Age Group	Group I	Group II
19-30 years	6 (30%)	7 (35%)
31-44 years	8 (40%)	8 (40%)
45-56 years	6 (30%)	5 (25%)
Total	20 (100%)	20 (100%)

Table (2) shows that: Most of hydroceles affect the middle age ones in both groups.

Table (3): Patients complaint in our study:

Complaint	Group I	Group II	T value
	No. (%)	No. (%)	
Swelling	10 (50%)	10 (50%)	0.191
Swelling and heaviness	5 (25%)	6 (30%)	
Swelling and mechanical interference	5 (25%)	4 (20%)	
Total	20 (100%)	20 (100%)	

Table (3) shows that: Most of patients' complaint was swelling in both groups. And there was no statistically significant difference between both groups as regards the patients' complaint, since T value > 0.05 (0.191).

Table (4): Mean operative time:

Group	Number (No.)	Mean ±SD	T Value
Group I	20	24.20±4.08	0.601
Group II	20	23.85±3.71	

Table (4) shows that: The mean operative time was 24.20 minutes in group I and 23.85 minutes in group II and there was no statistically significant difference between both groups as regard the operative time, since T value > 0.05 (0.601).

Table (5): Mean hospital stay:

Group	Number (No.)	Mean ±SD	T Value
Group I	20	2.10±1.71	0.192
Group II	20	2.20±1.57	

Table (5) shows that: The mean hospital stay was 2.10 days in group I and 2.20 days in group II and there was no statistically significant difference between both groups as regard the hospital stay, since T value > 0.05 (0.192).

Table (6): Mean time of suture removal:

group	Number (No.)	Mean ±SD	T Value
Group I	20	8.70±1.12	0.348
Group II	20	8.85±1.56	

Table (6) shows that: The mean suture removal was 8.7 days in group I and 8.85 days in group II and there was no statistically significant difference between both groups as regard the suture removal, since T value > 0.05 (0.348).

Table (7): Mean follow up:

group	Number (No.)	Mean ±SD	T Value
Group I	20	6.40±3.21	1.254
Group II	20	5.10±3.33	

Table (7) shows that: The mean follow up was 6.40 weeks in group I and 5.10 weeks in group II which was at 2 weeks, 1 month, 2 months, 3 months with no recurrence found and there was no statistically significant difference between both groups as regard the follow up, since T value > 0.05 (1.254).

Table (8): Scrotal Oedema:

Scrotal oedema	Group I	Group II	T value
	No. (%)	No. (%)	
No scrotal oedema	13 (65%)	9 (45%)	0.632
Scrotal oedema	7 (35%)	11 (55%)	
Total	20 (100%)	20 (100%)	

Table (8) shows that: 7 patients in group I had scrotal oedema and 11 in group II had scrotal oedema post operatively and were treated by anti-oedematous measures and scrotal support. Scrotal oedema was prominent in cases associated with excision of the tunica vaginalis. And there was no statistically significant difference between both groups as regard the scrotal oedema, since T value > 0.05 (0.632).

Table (9): Adherence of testes to scrotal wall:

Adherence of testes to scrotal wall	Group I	Group II	T value
	No. (%)	No. (%)	
No adherence	19 (95%)	18 (90%)	0.467
Adherence	1 (15%)	2 (10%)	
Total	20 (100%)	20(100%)	

Table (9) shows that: Most of patients in both groups showed no adherence of testes to scrotal wall, only (1) cases in group I and (2) cases in group II showed adherence of testes to scrotal wall. And

there was no statistically significant difference between both groups as regard the adherence of testes to scrotal wall, since T value > 0.05 (0.467).

Table (10): Mean time of drain removal in group I:

Group I	Number (No.)	Minimum	Maximum	Mean \pm SD
	20	2	4	2.55 \pm 0.82
Group II	20	5	10	5.1 \pm 0.15

Table (10) shows that: Mean time of drain removal in group I was 2.55 days with minimum after 2 days and maximum after 4 days. And 7 days for group II with minimal 5 and maximum 10 days.

DISCUSSION

A hydrocele, a common chronic condition in men, causes physical, psychological, social, and economic distress. Many men with a hydrocele think that they will never be cured, are often embarrassed by the condition, and frequently lose hope of living a normal life ⁽⁵⁾.

Hydroceles are generally painless. However, if pain is present, it may interfere with daily activities, and large hydroceles can even cause patients to have difficulty with sexual intercourse. Indications for treating a hydrocele include pain, the cosmetic appearance of the scrotum, or the patient's preference ⁽⁶⁾.

The conservative management of a hydrocele includes observation, aspiration, and sclerotherapy ⁽⁷⁾. Of these conservative methods, sclerotherapy has been most favored, and it may be indicated in patients who have a small to moderate hydrocele, who are unwilling to undergo surgery, or who are poor surgical candidates. The conventional surgery for an idiopathic hydrocele is excision and subsequent eversion of the sac, and this procedure remains the most popular surgical method ⁽⁸⁾.

Other techniques for treating a hydrocele in adults are the plication technique and internal drainage of the hydrocele ⁽⁹⁾.

The usual approach for hydrocelectomy in the adult is the scrotal route. The most troublesome problem in this method is a very discomforting scrotal swelling, which creates much difficulty for the patient and the managing surgeon. This problem can be avoided by performing hydrocelectomy using the inguinal approach in the adult. Apart from almost eliminating this postoperative problem of scrotal discomfort from marked swelling, this method enables inspection, discovery of testicular malignancy, and taking safe and appropriate actions against it. It also enables easy inspection, discovery,

and performance of appropriate actions on any coexisting inguinal hernia ⁽¹⁰⁾.

In our study, we considered the mild to moderate scrotal swelling as a normal or acceptable sequel after hydrocelectomy, but the persistent longstanding edema is considered to be a postoperative complication. The reported complications in the scrotal approach group were as follows: one wound sepsis, one partial wound dehiscence, two persistent scrotal edemas, and adherence of the testis to the scrotum in one patient. No postoperative complications or discomfort were observed in the inguinal approach group. There is no statistically significant difference in the mean operative time between the two groups and the patients in the inguinal approach group show short hospital stay and early return to normal life ⁽¹⁰⁾.

In this study, the application of the inguinal approach for hydrocelectomy in adults is associated with some limitations, such as not being suitable for patients presenting with previous ipsilateral inguinal surgery, previous ipsilateral inguinal radiotherapy, and recurrent hydroceles because of associated adhesions; it is also not suitable for patients presenting with a hydrocele with thickened tunica vaginalis (nontransilluminated hydrocele) and for those presenting with giant hydroceles because the large mass of the tunica vaginalis after aspiration of the hydrocele sac is associated with difficulty in delivery of the testis through the inguinal incision. Further studies are needed to show the relationship between the size of the hydrocele and the feasibility of the inguinal approach for hydrocelectomy in adults ⁽¹⁰⁾.

Ceylan *et al.* ⁽¹¹⁾ compared the scrotal and inguinal approaches in hydrocele repair in 32 adult patients and their results showed that hematoma occurred in four.

CONCLUSION

Hydrocelectomy using the inguinal approach in adults is associated with low or no postoperative morbidity, no discomfort, short hospital stay, and early return to normal life. It is easily applied and allows management of any associated lesions in the inguinal canal.

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