

Hydrocelectomy through the inguinal approach versus scrotal approach for idiopathic hydrocele in adults

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Background/aim

Hydrocele is a common chronic condition in men that causes physical, psychological, social, and economic distress. This study aimed to evaluate the outcome of hydrocelectomy through the inguinal approach as compared with the scrotal approach in adults.

Subjects 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.

Results

The mean volume of hydroceles was 196.00 ± 30.28 ml in the inguinal approach group and 197.75 ± 26.72 ml in the scrotal approach group. The mean operative time was 25.50 ± 4.60 min in the inguinal approach group and 24.40 ± 4.08 min in the scrotal approach group. The mean length of hospital stay was 1.35 ± 0.48 days in the inguinal approach group and 2.50 ± 0.68 days in the scrotal approach group. Postoperative complications in the scrotal approach group included 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. The mean time to return to normal activity was 12.10 ± 1.33 days in the inguinal approach group and 17.70 ± 4.13 days in the scrotal approach group.

Conclusion

Hydrocelectomy through the inguinal approach in adults is associated with low or no postoperative morbidity and discomfort. It is easily applied and facilitates dealing with any associated lesions in the inguinal canal.

Keywords:

adult, hydrocele, inguinal approach

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Introduction

Hydrocele is one of the most common causes of scrotal swelling [1]. A hydrocele testis is a pathological accumulation of serous fluid between the layers of the tunica vaginalis that occurs when the production of fluid by the vaginal tunic is 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 [2]. 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 [3,4], whereas acquired hydrocele is usually idiopathic in origin and it can occur at any time during adult life [3,5,6].

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 [5]. Origins other than idiopathic causes are infection, infarction, torsion, tumors, radiotherapy, tuberculosis, or filariasis [5,7]. It affects ~1% of adult men, and the adult type of hydrocele is seen mostly in men older than 40 years [8]. Hydroceles are bilateral in ~7–10% of patients. The effect of a hydrocele on the gonads has not been studied widely. A few studies have suggested that hydroceles may be associated with infertility by interfering with spermatogenesis [9,10].

The usual approach for hydrocelectomy in an adult is the scrotal approach. The most recent articles still describe hydrocelectomy procedures through a scrotal incision [11].

It is a well-known fact that the most troublesome problem following hydrocelectomy is scrotal swelling, which lasts for not less than 1 month and sometimes lasts up to several months [12]. The swelling is usually large, sometimes larger than the original problem [12], very discomforting, and has resulted in scrotal gangrene in some patients who complied poorly to the instructions or who have some conditions predisposing them to easy development of gangrene [12].

The scrotal swelling is usually due to a combination of the usually exaggerated inflammatory edema, as a response of the very sensitive scrotal skin to incision and dissection, and accumulation of serosanguinous oozes from the hydrocelectomy site. The dependent disposition of the scrotum assists these two factors in making the scrotal swelling large, very discomforting, and difficult to resolve quickly [12].

The purpose of this study was to evaluate the outcome of hydrocelectomy through the inguinal approach as compared with the scrotal approach in adults.

Subjects 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. These patients were divided into two groups: group I (inguinal approach group) included 20 patients whose ages ranged from 17 to 52 years, with a mean age of 30.75 ± 10.67 years, and who underwent hydrocelectomy through the inguinal approach, group II (scrotal approach group) included 20 patients, with ages ranging from 16 to 48 years and a mean age of 29.35 ± 8.93 years, who underwent hydrocelectomy through the scrotal approach. The presenting symptoms were scrotal swelling in all cases; 12 in the left side and eight in right side in the inguinal approach group, and 11 in the left side and nine in right side in the scrotal approach group. All patients were subjected to history taking, clinical examination, routine investigations, and scrotal ultrasonography. The inclusion criterion included patients with unilateral (idiopathic) primary vaginal hydrocele. Exclusion criteria included patients with suspected clinical or ultrasonographic findings of testicular tumor, associated scrotal or inguinal lesions, previous history of ipsilateral scrotal or inguinal surgery, previous inguinal radiotherapy, hypoalbuminemia, non-transilluminated hydroceles, giant hydroceles, or multilocular and recurrent hydroceles. All patients were operated upon under spinal anesthesia after obtaining written informed consent.

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

The patients were followed up postoperatively at 2 weeks, 1, 3, and 6 months.

Operative technique

Hydrocelectomy using the inguinal approach was performed through a skin crease inguinal incision over the external inguinal ring. Dissection was carried down to the external ring and external oblique aponeurosis. The external inguinal ring was opened by splitting the external oblique aponeurosis. The ilioinguinal nerve lying under the external oblique was preserved to minimize the risk of postoperative numbness and pain. The spermatic cord was mobilized and dislocated laterally and upwards. Gentle traction was applied on the spermatic cord and the hemiscrotum containing the hydrocele sac was given an upward push until the hydrocele sac emerged at the inguinal wound (Fig. 1b). The hydrocele fluid was aspirated from the inguinal wound using a 16 G needle attached to a 50 ml syringe in order to reduce its size so that it could be delivered easily into the inguinal wound (Fig. 1c). After delivery of the testis into the inguinal wound, the hydrocele sac was opened and care was taken to avoid contamination of the wound by the hydrocele fluid. The testis and other structures around it were then inspected for the possibility of malignancy or other lesions.

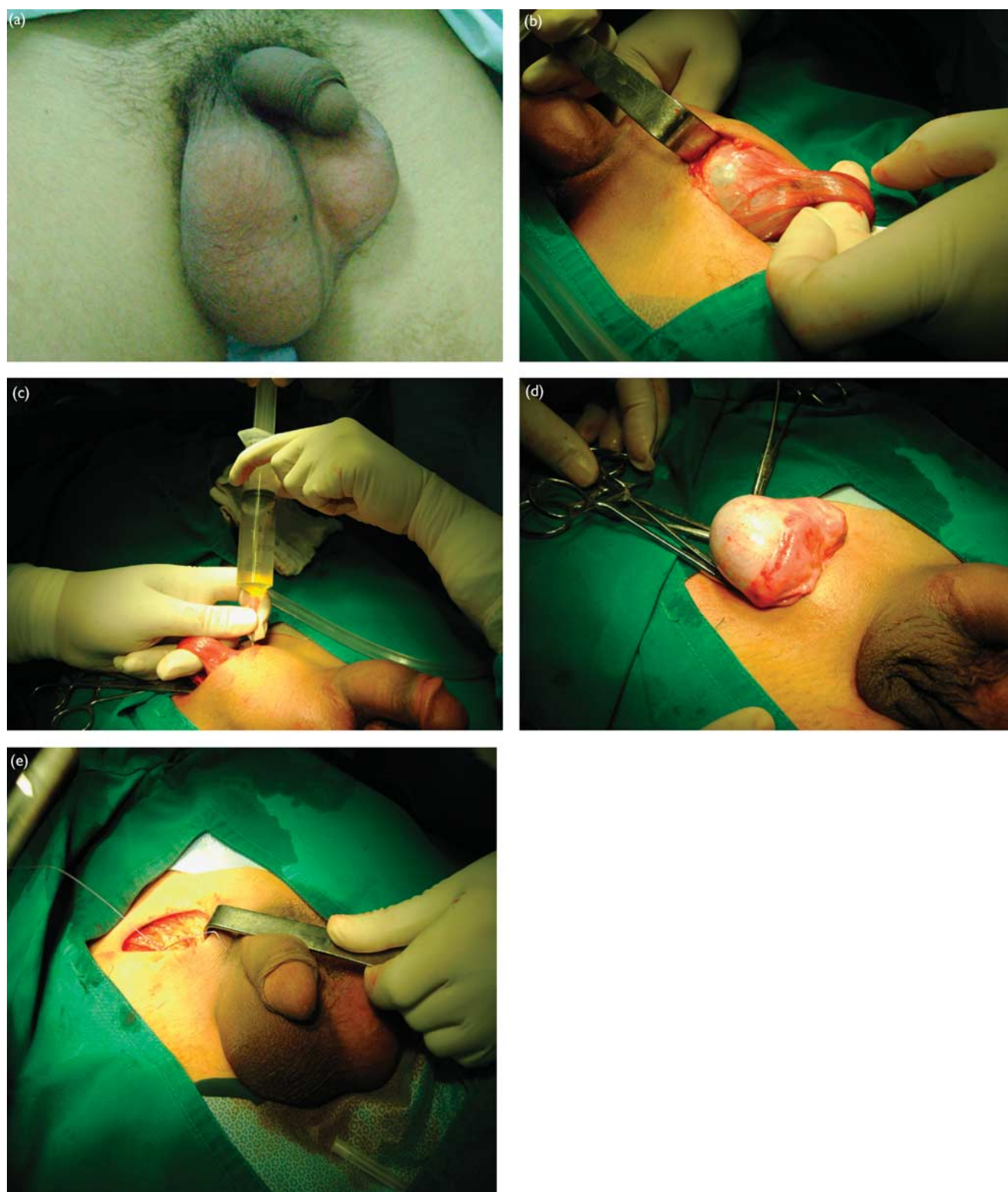
Hydrocelectomy was completed using Jaboulay's or Lord's procedure (Fig. 1d). The testis was repositioned to the hemiscrotum (Fig. 1e) and the inguinal wound was closed in layers – external oblique aponeurosis and subcutaneous tissue using Vicryle 3/0 and skin using subcuticular suture with 3/0 polypropylene without insertion of a drain. A scrotal support was applied and the subcuticular suture was removed after 10 days.

Hydrocelectomy using the scrotal approach was done through a transverse skin crease scrotal incision. The skin, dartos, and thin cremasteric fascia were incised as usual. Eversion of the tunica vaginalis was performed by the same methods used in the inguinal approach. After achievement of hemostasis a Penrose drain was inserted through a separate wound at the bottom of the scrotum. The wound was closed in layers using Vicryle 3/0, and the skin was closed by continuous suturing using Vicryle 4/0. A scrotal support was applied. The drains were removed after cessation of drainage, and no sutures were removed.

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 not significant.

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.

Figure 1

(a) Right idiopathic hydrocele in a 17-year-old boy who underwent hydrocelectomy through the inguinal approach. (b) Gentle traction was applied on the spermatic cord and the hemiscrotum containing the hydrocele sac was given an upward push until the hydrocele sac emerged at the inguinal wound. (c) Aspiration of the hydrocele fluid under vision through the inguinal wound. (d) Delivery of the testis into the inguinal wound and eversion of the tunica vaginalis completed. (e) Repositioning of the testis to the hemiscrotum.

All procedures were successfully completed with no intraoperative complications related to surgery or to anesthesia in both groups. There were no complications related to intraoperative aspiration of hydrocele fluid in

the inguinal approach group, and all the hydrocele sacs were delivered easily into the inguinal wounds after aspiration. No underlying cause for hydrocele was found in any of the patients in both the groups.

The mean operative time was 25.50 ± 4.60 min (range, 20–35 min) in the inguinal approach group and 24.40 ± 4.08 min (range, 18–30 min) in the scrotal approach group. The difference in the mean operative time between the two groups was statistically not significant.

The mean length of hospital stay was 1.35 ± 0.48 days (range, 1–2 days) in the inguinal approach group and 2.50 ± 0.68 days (range, 2–4 days) in the scrotal approach group. The difference in the mean length of hospital stay between the two groups was statistically significant. The mean time to return to normal activity was 12.10 ± 1.33 days in the inguinal approach group and 17.70 ± 4.13 days in the scrotal approach group. The difference in the mean time to return to normal activity between the two groups was statistically significant.

Postoperative complications in the scrotal approach group included wound sepsis in one patient; tearing of skin at the suture line with partial wound dehiscence in one patient; mild to moderate scrotal edema in all patients, whereas persistent scrotal edema lasting more than 2 months was observed in two patients; and adherence of the testis to the scrotum in one patient (Tables 1 and 2). There was postoperative discomfort associated with all patients of the scrotal approach group as compared with the inguinal approach group. The postoperative period in the inguinal approach group passed smoothly with no complications or discomfort. The mean follow-up was 2.80 ± 1.88 months in the inguinal approach group and 2.90 ± 1.83 months in the scrotal approach group, and no evidence of recurrence was observed in both groups.

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 [13]. 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 [14].

Indications for treating a hydrocele include pain, the cosmetic appearance of the scrotum, or the patient's preference [13,14]. The conservative management of a hydrocele includes observation, aspiration, and sclerotherapy [15]. 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 [16]. Other techniques for treating a hydrocele in adults are the plication technique and internal drainage of the hydrocele [17].

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 [12].

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.

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.

Ceylan *et al.* [18] compared the scrotal and inguinal approaches in hydrocele repair in 32 adult patients and their results showed that hematoma occurred in four

Table 1 Demographic characteristics of patients under study

Data	Mean $\pm$ SD		P-value
	Group 1	Group 2	
Mean age	30.75 ± 10.67	29.35 ± 8.93	0.503
Volume of hydrocele sac	196 ± 30.28	197.75 ± 26.72	0.868
Operative time	25.50 ± 4.60	24.40 ± 4.08	0.334
Hospital stay	1.35 ± 0.48	2.50 ± 0.68	0.000
Time of return to daily life	12.10 ± 1.33	17.70 ± 4.13	0.000
Follow-up period	2.80 ± 1.88	2.90 ± 1.83	0.797

Table 2 Postoperative complications in scrotal approach group

Complications	N (%)
Wound sepsis	1 (5%)
Wound dehiscence	1 (5%)
Persistent scrotal edema	2 (10%)
Adherence of the testis to the scrotum	1 (5%)
Total	5 (25%)

patients in the scrotal approach group and in one patient in the inguinal approach group. They concluded that the inguinal approach is a feasible option in the surgical treatment of adults with hydrocele as it results in less edema than that noted with the scrotal approach

Nweze [12] performed hydrocelectomy on 11 adult patients using the inguinal approach by making an inguinal incision parallel to the inguinal ligament and aspirating the hydrocele sac through the scrotum during the preoperative preparations inside or outside the theater; his results show minimal or no scrotal swelling and virtually no discomfort in all patients, and the inguinal wounds, as expected, did not lead to much problem and healed easily – as seen in herniorrhaphy wounds.

Our results agreed with the results of Ceylan *et al.* [18] and Nweze [12], but we disagreed with them on the aspiration method, and we preferred the transverse skin crease inguinal incision instead of the inguinal incision parallel to the inguinal ligament because the transverse incision gives more exposure and accessibility to the neck of the scrotum and allows easy aspiration of the hydrocele sac. Moreover, we preferred the aspiration of the hydrocele sac under vision through the inguinal wound instead of blind aspiration through the scrotum to avoid testicular injury and postaspiration scrotal ecchymosis or hematoma due to injury of scrotal vessels.

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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Conflicts of interest

There are no conflicts of interest.

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