Comparative study between eversion of tunica vaginalis versus fenestration in treatment of unilateral primary vaginal hydrocele

Original Article

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ABSTRACT

Introduction: Hydrocele is among the most common benign conditions of the scrotum. Its incidence is around 1% in the adult male population, with a predilection for males above 40 years of age.

Aim: This is to evaluate the efficacy, safety, and outcomes of eversion of tunica vaginalis versus fenestration in the treatment of unilateral primary vaginal hydrocele in adult males.

Patients and Methods: This is prospective study was conducted at the Department of General Surgery, Al-Zahraa University Hospital, between May 2023 and April 2024. This study was done on 30 patients who were classified into two equal groups. Group A includes 15 patients undergoing excision eversion of tunica vaginalis. Group B 15 patients undergoing fenestration of tunica vaginalis. All the patients were followed up postoperatively in weeks 1, 4, and 12.

Results: Out of the patients in group A (eversion), three (20%) patients had edema and hardness, and only one (6.7%) patient had a postoperative hematoma. Additionally, one (6.7%) patient reported a wound infection, and another patient (6.7%) reported a recurrence. Nine patients, or 60% of the total, had no postoperative problems. Merely two (13.3%) patients of the research participants in group B (fenestration) exhibited problems, with one (6.7%) patient experiencing edema and hardness. Furthermore, one (6.7%) patient reported having a wound infection. Out of the total patients, 13 (86.5%) patients had no postoperative problems.

Conclusion: We hereby present our experience with that the fenestration technique to be the procedure of choice for the treatment of primary vaginal hydrocele.

Key Words: Fenestration, scrotal swelling, testicular hydrocele.

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INTRODUCTION

Hydrocele is the most prevalent benign scrotal condition[1].

It is a collection of fluid located in the space between the tunica vaginalis's parietal and visceral layers. An imbalance between fluid secretion and subsequent reabsorption is identified as the pathophysiology of hydrocele[2]. The hydrocele is categorized as acquired and congenital based on its etiology. Acquired hydrocele is commonly caused by intrascrotal infections, some systemic or regional illnesses, neoplasms, and scrotal or inguinal trauma. Idiopathy, however, is the most frequent reason. A clinical examination and scrotal ultrasonography are regarded as the initial possibilities for diagnosis[3]. Its frequency in adult males is around 1%, particularly in those over 40[4].

According to a recent Swedish research, there are 60 males with hydrocele for every 100 000 patients annually who need medical support. Of them, around 17 out of every 100 000 patients need an ongoing care plan[5]. Even though various surgical methods, like fluid aspiration or sclerosing agent injections into the scrotal sac, are tried for its management, conventional surgical techniques like Jaboulays Eversion of Sac and Lord plication of redundant tunica vaginalis continue to be the most often used procedures used in the treatment of idiopathic adult hydrocele. Both invasive treatments have a low risk of recurrence and are linked to long-term success[6].

PATIENTS AND METHODS:

This study was conducted at Al-Zahraa University Hospital between May 2023 and April 2024 was done on 30 patients diagnosed with primary vaginal hydrocele, classified into two groups according to the type of operation:

Group A: including 15 patients treated by excision eversion of tunica vaginalis.

Group B: including 15 patients treated by fenestration excision of a part of tunica and stitching the edges.

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Inclusion criteria

All elective cases in the age group from 30 to 50 years,complaining of unilateral swelling at the scrotal region with features of transillumination test positive .

Exclusion criteria

Secondary hydrocele, bilateral hydrocele, patients un fit for anesthesia, patients below 30 years, and patients above 50 years.

Every patient gave their written consent. A scrotal ultrasound was performed to rule out any other intrascrotal pathological disorders after the history and physical examination with scrotal transillumination were completed as part of the clinical assessment.

The stages of both operational interferences were described to all patients. Every operating technique has been authorized by the local ethics commission. The ethical review committee, overseen by the general director of Al-Zahraa University Hospital in Cairo, Egypt, gave ethical permission for this study.

Eversion of tunica vaginalis procedure

The incision is made in the paramedian plane to the median raphe anteriorly.

The testis was delivered through an incision in the scrotum, the tunica was opened and everted, the majority of the hydrocele sac was resected with electrocautery, and a respectable cuff was left along the testicle's borders (Fig. 1).

The hydrocele sac's free borders were closed with a running suture to limit bleeding, and electrocautery was used to achieve hemostasis. The scrotum was sealed using a standard two-layer closure and a short tube drain. On the second day, the patients were checked for hematoma and scrotal edema, and on the third day, the drain was taken out.

Fenestration technique

A 2-cm scrotal incision was made, and electrocautery was used to make an incision in the Dartos muscles along the same line (Fig. 2). With the help of the index finger, the parietal tunica vaginalis was gripped, and a little hole was formed for the suction of hydrocele fluid (Fig. 3).

Next, using electrocautery, a disc of parietal tunica vaginalis tissue was removed that was almost twice the size of the skin incision (Fig. 4). In order to expose the visceral tunica toward the scrotal skin, the edge of the visceral surface tunica vaginalis was sutured to the parietal layer of the tunica vaginalis and subsequently to the Dartos (Fig. 5). All sutures were made to the scrotal skin in an everted fashion. Eversion will result by suturing the visceral surface of the tunica vaginalis to the Dartos. This everted structure then comes into touch with lymph-rich subcutaneous tissues when it is sutured to the scrotal skin. On the same day, discharge was permitted and a drain was left in place.

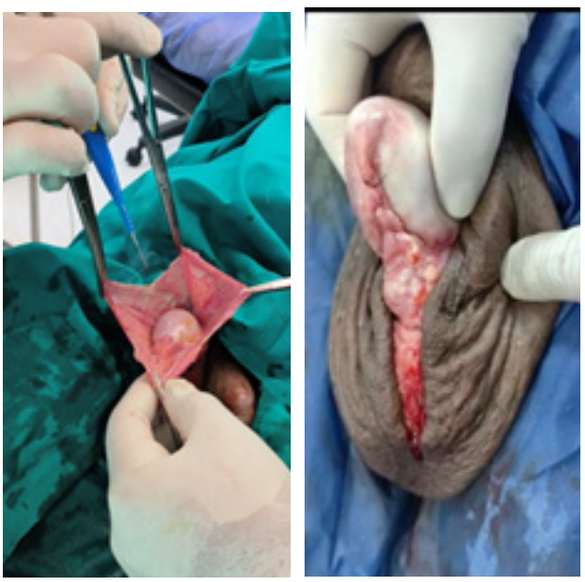

Fig. 1: An operative photograph showing the hydrocoele sac was opened completely. Redundant wall sac was trimmed, leaving a margin of 2 cm, sac was then everted behind the testis with an interrupted suture).

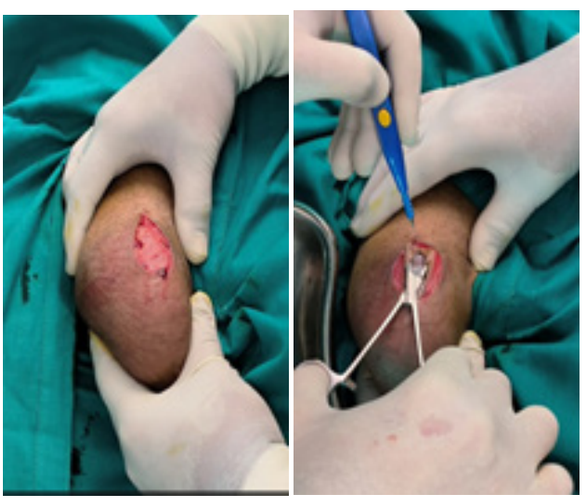

Fig. 2: Skin, Dartos, and cremasteric fascia are incised and reflected together as a single layer from the underlying parietal layer of the tunica.

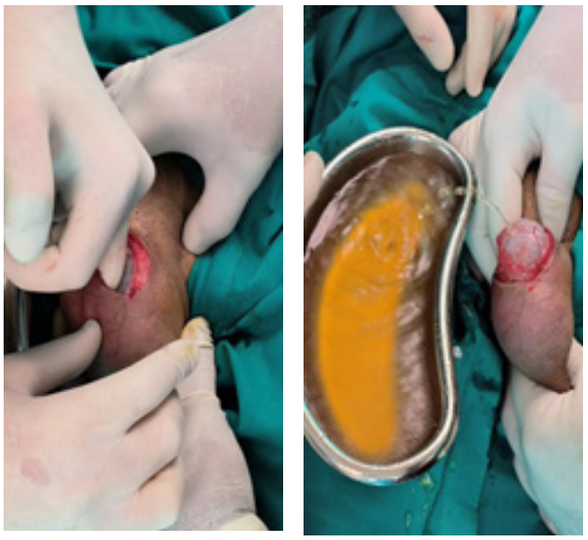

Fig. 3: Blunt dissection between the Dartos muscle and tunica vaginalis, a small hole was made for aspiration of hydrocele fluid.

Fig. 4: Disc of tissue was excised of the parietal tunica vaginalis.

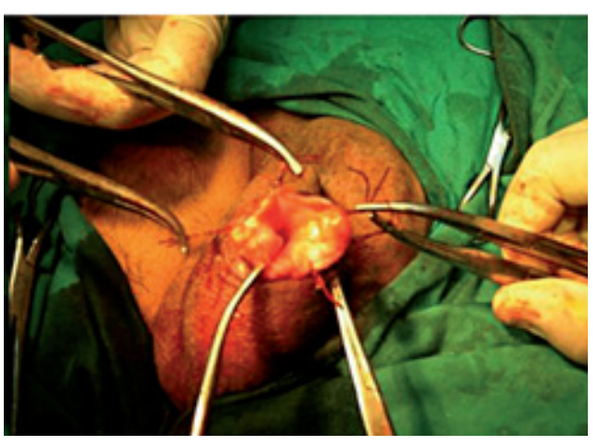

Fig. 5: The visceral surface of the tunica vaginalis was sutured to the Dartos, and eversion was created.

Statistical analysis

All data were collected, tabulated, and statistically analyzed using SPSS 26.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Qualitative data were described using numbers and percent. Quantitative data were described using range (minimum and maximum), mean, SD, and median. All statistical comparisons were two-tailed with a significance level of *P value* less than or equal to 0.05 indicates significance, *P value* of 0.05 indicates no significant difference.

RESULTS:

The two groups did not differ statistically significantly in terms of age, BMI, length of symptoms, or hydroceles' size. The average age in group A was 39.93±5.95. The mean age in group B was 40.13±6.221. The mean operating time in group A was 32.27 min, with a range of 25–40 min; in group B, the mean operating time was 15.92 min, with a range of 12–18 min (*P≤0.02*). The two groups differed significantly in terms of operational time. Group A's mean hospital stay was 6.66±1.96 h, with a minimum of 5 h and a maximum of 8 h. Group B's mean hospital stay was 4.73±2.063 h, with a minimum of 3 h and a maximum of 6 h. However, there was no significant difference in the amount of time each group spent in the hospital (h) (*P≥0.05*). The number of days between the day of surgery and the first day a patient returned to work was used to determine how much time they had off from work. In group A, the average duration taken to return to work was 11.87±1.99 (9–15) days, whereas in group B, it was 8.40±1.12 (6–10) days (*P=0.0001*). There were significant differences between both groups as regards time off from work (Table 1).

Out of the patients in group A (eversion), three (20%) patients had edema and hardness, and only one (6.7%) patient had a postoperative hematoma. Additionally, one (6.7%) patient reported a wound infection, and another patient (6.7%) reported a recurrence. Nine patients, or 60% of the total, had no postoperative problems. Merely two (13.3%) patients of the research participants in group B (fenestration) exhibited problems, with one (6.7%) patient experiencing edema and hardness. Furthermore, one (6.7%) patient reported having a wound infection. Out of the total patients, 13 (86.5%) patients had no postoperative problems (*P<0.02*). About postoperative complications, there were notable differences between the two groups (Table 2).

Table 1: Mean operative time, hospital stay, and time off from work in both groups

Items	Group A	Group B	*P* value
Operative time (min)	32±4.27	15±1.92	*P*≤0.02
Hospital stay (h)	6.66±1.96	4.73±2.063	*P*≥0.05
Time off from work (days)	11.87±1.99	8.40±1.12	*P*=0.0001

Table 2: Overall complication rate in both groups

Postoperative complication		
Groups	Frequency	Percent
Group A (*N*=15)		
Postoperative hematoma	1	6.7
Wound infection	1	6.7
Recurrence	1	6.7
Nil	9	60.0
Edema and hardening	3	20.0
Total	15	100.0
Group B (*N*=15)		
Wound infection	1	6.7
Nil	13	86.7
Edema and hardening	1	6.7
Total	15	100.0

DISCUSSION

Hydrocele affects about 1% of men, and it is probably the most common scrotal condition for which patients seek urological evaluation[7]. Conventional surgery for treatment of idiopathic hydrocele includes excision and subsequent eversion of the sac. However, large edema, hematoma, and infection may develop after these procedures since they require excessive handling and wide dissection of the testicular sac[8].

The procedure of fenestration involved the fenestration of the tunica and the use of the pull-through technique to remove large hydrocele sacs with minimal dissection and through a small incision in the skin. The incision is essentially transverse between the blood vessels and the skin lines, and the wound is closed with a fine approximation of the skin and dartos fascia[9].

In this investigation, patients undergoing eversion of the tunica vaginalis had an average operating time of 25–40 min, with a mean of 32±4.27 min. This was longer than the mean operating time of group B patients undergoing fenestration, which varied from 12 to 18 min with a mean value of 15±1.92 min (*P≤0.02*). Due to the considerable amount of time spent in achieving hemostasis and partial sac excision, there was a substantial difference in the operational times between the two groups.

Additionally, patients in group A took longer time off from work than those in group B, with a statistically significant distribution. This finding is consistent with previously published data on the same topic, which is consistent with a study by Dubey and Lamture that found that patients who had the hydrocele window operation had a mean operating time of 17.34 SD 1.81 min with a range of 15–20 min, and patients who had the Boulay procedure had a mean operating time of 31.58 SD 2.05 min with a range of 29–35 min. Between the two surgical procedures, there was a statistically significant difference in mean time (*P<0.001*).

The study found that group A's mean hospital stay was 6.66±1.96 h, with a minimum of 5 h and a maximum of 8 h, while group B's mean hospital stay was 4.73±2.063 h, with a minimum of 3 h and a maximum of 6 h. However, there was no significant difference in the hours of hospital stay between the two groups (P≥0.05).

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Furthermore, our research contradicts that of Dembélé, which found that patients undergoing conventional hydrocelectomy (Jaboulay's) had a mean hospital stay of 71.82 SD 10.76 h, with a range of 48–88 h, and patients undergoing window surgery had a mean hospital stay of 44.04 SD 13.59 h, with a range of 24–79 h.

In this study, 26.6% of the patients had complications, of which 10% had hardness and edema, 3.5% had hematomas, 3.5% had recurrences, and 6.6% had just wound infections. Of those who had surgery, 73.45% experienced no problems.

Patients in group A experienced a greater incidence of postoperative hemorrhage, scrotal edema, and hardness than patients in group B, despite group A patients undergoing more tissue dissection.

Two patients in each group in the current trial had mild to moderate cellulitis, a superficial surgical site infection limited to the scrotal skin, requiring an extraoral course of Cephradine (1 g 12/12 h).

Just 6.7% of the trial participants in group A had a postoperative hematoma, whereas 20% of them had edema and hardness. Of the patients in group A, 40% had problems. Additionally, 6.7% of patients had postoperative wound infections, and 6.7% of patients had disease recurrences, which were both verified by two US studies. Sixty percent of the patients had no problems following surgery.

Using a little scrotal incision and little dissection, a disc of the hydrocele sac is extracted and removed in

the fenestration procedure. Therefore, group B patients did not exhibit hematoma development. Group B study participants exhibited problems in 13.3% of cases, with 6.7% developing edema and hardness. A total of 86.5% of the patients had no postoperative problems (*P≤0.02*), while 6.7% had a postoperative wound infection. There were notable differences in postoperative complications between the two groups.

CONCLUSION

The results of this study suggest that fenestration is better than excision eversion and a more effective treatments for unilateral primary vaginal hydrocele. Fenestration have advantages over excision eversion in terms of minimal manipulation and local trauma to the tissue, and the overall complication rate is much less with more patient satisfaction.

CONFLICT OF INTEREST

There are no conflicts of interest.

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