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Research Article

Can the Hydrocele Sac Dissection Technique Affect the Surgical and Cosmetic Satisfaction Results of Conventional Hydrocelectomy?

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Abstract

Aim: In this study, we applied the classical technique and modified open pull-through procedure (OPtP) for hydrocele sac dissection in excisional Winkelmann hydrocelectomy procedure (WHP) to retrospectively compare the surgical and cosmetic satisfaction results of the two techniques.

Material and Methods: Sixty-two patients underwent excisional WHP from 2017 to 2020. The modified OPtP and classical technique groups included 30 and 32 patients, respectively. The intraoperative and postoperative parameters of the patients in both groups were evaluated statistically until the postoperative second month. Cosmetic satisfaction was evaluated statistically at the postoperative sixth month.

Results: Postoperative infection and recurrence were not observed in either group. The patients in both groups had large hydrocele sacs. There was no statistically significant difference between the groups in terms of the hydrocele sac volume, operation time, length of hospitalization, postoperative scrotal edema, and postoperative scrotal pain scores ($p>0.05$). The postoperative hematoma rate was 15.6% in the classical technique group. The statistical difference in incision length and cosmetic satisfaction was significant in favor of the modified OPtP group ($p<0.05$).

Conclusion: Excisional WHP was determined to be safe in the treatment of large hydroceles. In the modified OPtP group, shorter scrotal incision length and low risk of postoperative scrotal hematoma were achieved, and cosmetic satisfaction was also increased.

Keywords: CHP, WHP, OPtP, SMRI

INTRODUCTION

Testicular hydrocele is formed by fluid accumulation at a pathological rate between the visceral and parietal layers of the tunica vaginalis. Surgical treatment is applied due to cosmetic or pain complaints related to the scrotum. Conventional hydrocelectomy procedures (CHPs) or minimally invasive procedures are preferred for surgical treatment (1).

CHPs are known as Winkelmann, Bergman, and Lord techniques. Minimally invasive procedures include percutaneous aspiration and sclerotherapy, endoscopic resection, and open pull-through procedure (OPtP) (2). Studies have shown a lower risk of complications, such as wound infection, epididymo-orchitis, scrotal hematoma, and epididymo-vas deferens trauma due to minimally invasive procedures. Only the recurrence risk has been observed to be higher in these procedures than in CHPs (3).

Hydrocele sac (HS) dissection in hydrocelectomy can be applied in intrascrotal or extrascrotal areas totally or partially. The blind intrascrotal total dissection of HS is the classical technique used in CHPs. OPtP, a minimally invasive technique, refers to the extrascrotal partial dissection of HS (3,4). In the endoscopic resection technique, HS is resected in the scrotum without dissection (5).

CITATION

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In CHPs, HS can be excised totally or partially. Plication is applied to HS in the Lord technique. In OPtP or other minimally invasive procedures, HS can only be excised partially (5). The excised amount of HS can affect the hydrocele recurrence risk (3,5).

In this study, we applied the classical technique and modified OPtP for HS dissection in excisional Winkelmann hydrocelectomy procedure (eWHP). Then, we retrospectively compared the surgical and cosmetic satisfaction results of the two groups.

MATERIAL AND METHOD

This retrospective study was conducted with 62 male patients who underwent eWHP for idiopathic hydrocele between September 2017 and September 2020. The patients had scrotal swelling and pain complaints. After the physical examination, complete urine analysis and scrotal ultrasonography examinations were performed. eWHP was planned for patients with a pre-diagnosis of hydrocele. According to the technique used in eWHP, two groups were formed, with 30 patients in the modified OPtP and 32 patients in the classical technique group. Two different urologists performed the procedures in the two groups. All the patients underwent surgery under spinal anesthesia after 1 g of ceftriaxone administration in the preoperative period. The patients were followed up at the postoperative first week, first month, second month, third month, and sixth month. Postoperative complications and related treatments were recorded. The intraoperative and postoperative parameters of the patients were statistically compared between the groups until the postoperative second month. Patients' cosmetic satisfaction was evaluated at the postoperative sixth month using the following question: "Are you satisfied or dissatisfied with your scrotal cosmetic appearance after surgery?" Patients with chronic systemic diseases, inguinal surgery, or epididymo-orchitis were excluded from the study.

Statistical analysis

IBM SPSS Statistics 22.0 program was used for statistical analysis while evaluating the findings obtained in the study. In addition to descriptive statistical methods (mean and standard deviation), the Student t-test was used to compare quantitative data between the two groups. Fisher's exact test and the continuity correction (Yates) test were used to compare qualitative data. Significance was evaluated at the $p<0.05$ level.

Surgical technique of modified OPtP in eWHP

A scrotal median raphe incision (SMRI) was applied, and the scrotum layers were cut through to reach the parietal layer of the tunica vaginalis, and the surrounding area was slightly dissected and then aspirated. HS and the testis were pulled out of the scrotum, and the sharp HS dissection was completed by preserving the gubernaculum. Then, the layers of HS were resected and mutually sutured posterior to the testis. Finally, the testis was pulled into the scrotal compartment without suturing. The right hydrocele and incision line are shown in Figure 1, the pulled right testis within HS in Figure 2, the whole dissected HS and gubernaculum in Figure 3, a residual parietal layer of tunica vaginalis in Figure 4, and the end of the operation in Figure 5.

Figure 1. Incision line in a right hydrocele

Figure 2. The pulled right testis within HS

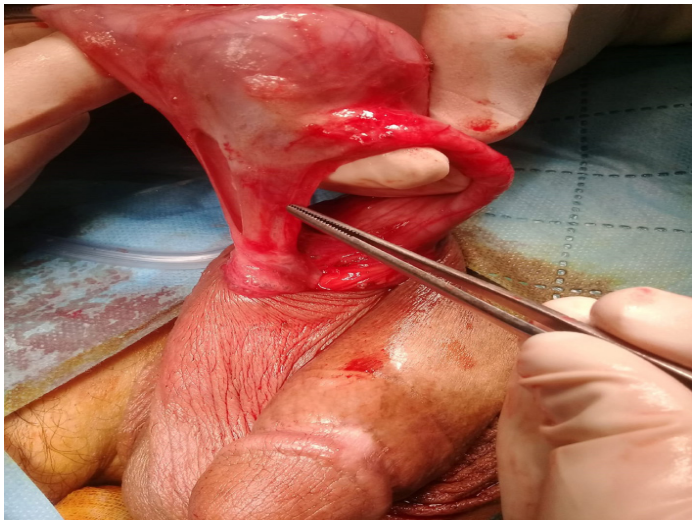

Figure 3. Whole dissection of HS and the gubernaculum

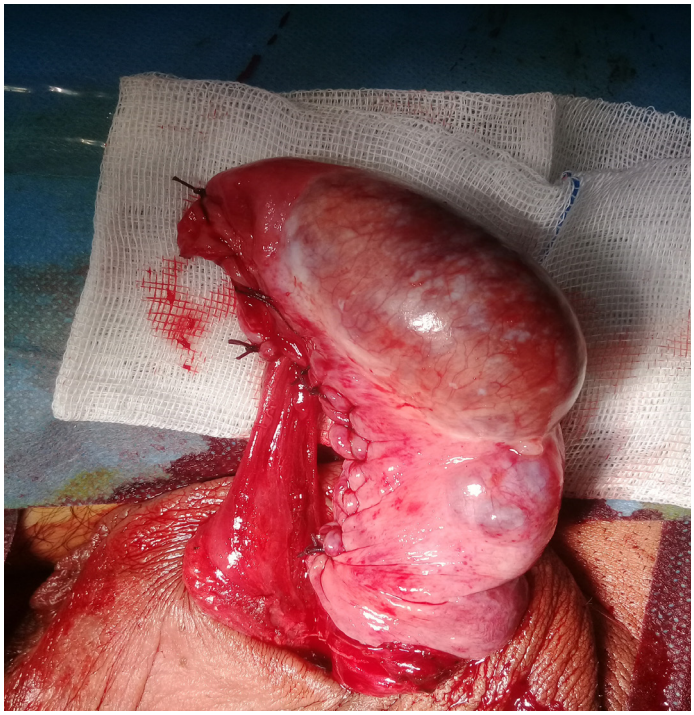

Figure 4. Residual parietal layer of the tunica vaginalis

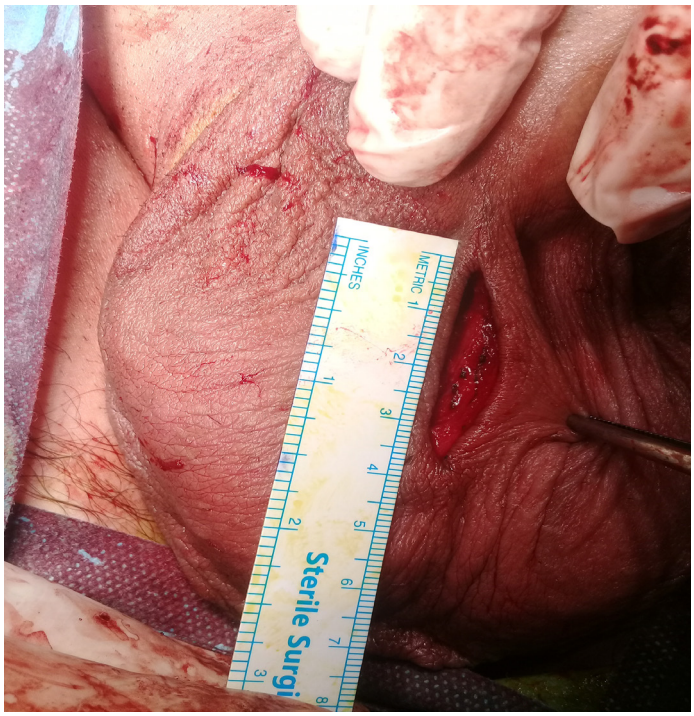

Figure 5. End of operation

Ethics committee approval

The study was approved by the ethical committee of Harran University Faculty of Medicine [Number: HRU-21/02/2012]. All the procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and national research committee and the principles of the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Consent and permission were obtained from all the patients who participated in the study.

RESULTS

The ages of the 62 patients included in the study ranged from 20 to 72 years, with a mean value of 43.60±11.08 years. There was no statistically significant difference between the OPtP and classical technique groups ($p<0.05$).

All the patients' scrotal complaints of edema, pain, and hematoma during the postoperative period were observed to have improved at the second month follow-up. Postoperative infection and recurrence were not observed in either group. Both groups had large HSs. There were no statistically significant differences between the two groups in terms of the HS volume, operation time, length of hospitalization, postoperative scrotal edema, and postoperative scrotal pain scores ($p>0.05$). The detailed results are shown in Table 1.

The incision length of the classical technique group was significantly higher than that of the modified OPtP group ($p<0.01$). There was no statistically significant difference in the incidence of postoperative hematoma between the groups ($p>0.05$). It was remarkable that the rate of scrotal hematoma observed in the classical technique group (15.6%) was significantly higher compared to the modified OPtP group. There was a statistically significant difference between the cosmetic satisfaction levels of the two groups ($p<0.01$). The cosmetic satisfaction rate of the modified OPtP group was significantly higher than that of the classical technique group (Table 1).

Table 1. Intraoperative and postoperative parameters of the patients

		Modified OPtP group	Classical technique group	p
		Mean±SD	Mean±SD	
Incision length (cm)		3.35±0.48	6.0±0.67	[1]**0.001****
Hydrocele sac volume (cc)		178.67±63.88	190.31±74.64	[1]0.513
Operation time (min)		31.50±5.12	29.44±4.01	[1]0.082
		n = 30; %100	n = 32; %100	
Length of hospitalization	1 day	22;%73.3	18;%56.3	[2]0.255
	2 days	8;%26.7	14;%43.8	
Postoperative scrotal Edema	Present	8;%26.7	14;%43.8	[2]0.255
	Absent	22;%73.3	18;%56.3	
Postoperative scrotal Pain	Present	4;%13.3	9;%28.1	[2]0.264
	Absent	26;%86.7	23;%71.9	
Postoperative scrotal hematoma	Present	0;%0	5;%15.6	[3]0.053**
	Absent	30%100	27;%84.4	
Cosmetic Satisfaction	Satisfied	30;%100	25;%78	[3]0.005**
	Unsatisfied	0;%0	7;%22	

[1]Student t-test [2]Continuity correction (Yates) test [3]Fisher's exact test
**p < 0.01 SD: Standard deviation

DISCUSSION

Testicular hydrocele is most frequently observed in male patients over the age of 40 years due to idiopathic causes (6). Operation time is around 30 minutes in all open hydrocelectomy procedures. Although hospitalization is generally one day, patients undergoing hydrocelectomy can also be discharged on the same day (7). In our study, the mean patient age was over 40 years for both groups. The mean operation time and postoperative length of hospitalization were also consistent with the literature.

Trans-scrotal incision (transverse or paramedian) is generally preferred for CHPs. The incision length is around 6 cm (8,9). Studies using SMRI are limited (10). In addition, both inguinal canal pathology and hydrocelectomy treatment are performed simultaneously through the inguinal route (9,11). In minimally invasive procedures, the scrotal incision length is less than 2 cm (12). In our study, SMRI was applied at an average of 3.35 cm in the modified OPtP group and 6 cm in the classical technique group, which indicated a statistically significant difference. The targeted minimum SMRI length in the modified OPtP group was sufficient to remove the aspirated HS with the pulling of the testis into the extrascrotal area.

WHP and the Bergmann hydrocelectomy procedure are used in the excisional surgical treatment of large, long-standing, or multi-located hydroceles. The inadequate excision of HS can increase the postoperative recurrence risk. The classical HS dissection technique is generally applied, in which the testicular gubernaculum is not preserved in the excisional hydrocelectomy procedure (13). In OPtP, the aspirated HS is pulled piece by piece into the extrascrotal area for partial dissection and resection (3). There are studies that applied scrotoscopy prior to OPtP. However, HS is excised with a resectoscope without dissection in Su-Wang's procedure (5). In our study, the size of HSs was large in both groups. In the modified OPtP technique we used, the scrotal incision was longer than in the classical OPtP technique. In addition, HS was total dissected and widely resected compared to the classical OPtP. In the literature, we did not find any study performing WHP by preserving the testicular gubernaculum.

Scrotal edema, wound infection, testicular pain, recurrence, epididymis injury, and orchiectomy are complications that can be seen after hydrocelectomy (14). In studies in which the complications of CHPs were compiled, the overall complication rate including scrotal hematoma, testicular pain and infection incidence was 11.4%, and the recurrence rate was 6.2% (13,15). In addition, in similar studies, the success of cosmetic satisfaction was 75% (7,8). In some studies in which aspiration and sclerosing agent injections were applied to patients with high morbidity and mortality risk, the success and complication rates were low (16,17). The postoperative complication rates of minimally invasive procedures were reported to be 10% for scrotal edema, 6.4% for testicular infection, and 4% for recurrence. Cosmetic satisfaction was also over 95% (12). In our study, no infection or recurrence was observed in either group. In the modified OPtP group, scrotal edema was observed at a rate of 26% and scrotal pain at 13.3%. In the classical technique group, scrotal hematoma was seen in 15.6% of the patients, scrotal edema in 43.8%, and scrotal pain in 28%. Although the differences in the rates of postoperative complication parameters of the two groups were not statistically significant, the rate of scrotal hematoma in the classical technique group was remarkable. Although the cosmetic satisfaction of both groups was at a high level, the difference between the groups was statistically significant in favor of the modified OPtP group.

CONCLUSION

In this study, eWHP was determined to be a safe procedure in the surgical treatment of large HSs. Neither HS dissection technique was superior to the other in terms of postoperative complication parameters (recurrence, scrotal pain, and scrotal edema). However, the use of the modified OPtP technique in eWHP resulted in a shorter incision length, preservation of the gubernaculum, and lower risk of postoperative hematoma and increased the cosmetic satisfaction of the patients.

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Conflict of Interest: *The authors declare that they have no competing interest.*

Ethical approval: *The study was approved by the ethical committee of Harran University Faculty of Medicine [Number: HRU-21/02/2012].*

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