

A NEW APPROACH IN THE MANAGEMENT OF THE HYDROCELE WITH A SILICONE CATHETER

MEHMET ARSLAN, MEHMET KILINÇ, KADIR YILMAZ, AND AHMET ÖZTÜRK

ABSTRACT

Introduction. To describe a new alternative technique to overcome several disadvantages of previous techniques to repair idiopathic hydrocele. Idiopathic hydrocele, which causes scrotal enlargement and discomfort for patients, is an abnormal fluid collection between the parietal and visceral layers of tunica vaginalis of the testis. Surgical and sclerotherapy treatments have previously been used to treat this problem.

Technical Considerations. Forty-five patients with hydrocele (aged 19 to 67 years) underwent an alternative procedure using a silicone catheter 15 to 20 cm in length in which holes had been made to enable flow of the hydrocele fluid from the parietal layer of the tunica vaginalis to the surrounding scrotal tissue. After an incision of approximately 5 mm on the scrotal wall with a scalpel knife, a cannula was pushed through the hydrocele sac with a gentle rotation until reaching the upper scrotal wall. A silicone catheter with holes was passed through the cannula to the point of the incision by way of the cannula. At the end, both tips of the catheter were sutured. During the procedure, the hydrocele fluid was emptied using an angiocatheter before the cannula was removed.

Conclusions. The results of this study indicate that this procedure does not require dissection, incision, or manipulation of the scrotal contents during treatment. It also resulted in a low rate of recurrence during the 1 to 3 years of follow-up. Additionally, the procedure has minimal complications and requires a short time, only about 15 minutes. *UROLOGY* 63: 170–173, 2004. © 2004 Elsevier Inc.

Idiopathic hydrocele is an abnormal fluid collection between the parietal and visceral layers of the tunica vaginalis of the testis. Although it is a benign condition, patients with large hydroceles complain of scrotal enlargement and discomfort.^{1,2} Both surgical and sclerotherapy treatments have been used for hydrocele. Surgery is generally considered the most effective treatment.^{1,2} Hu *et al.*¹ reported that sclerotherapy is an ideal procedure for patients with poor surgical or anesthetic risk and for patients who refuse surgery. The conventional curative surgical procedures remain the most popular treatment for hydrocele. We present a new technique that is considered better than the conventional procedures, because it eliminates several disadvantages of the former procedures.

MATERIAL AND METHODS

Between September 1990 and June 2001, 45 men (age range 19 to 67 years, mean 47) with hydrocele underwent the treatment. All men were informed about the procedure and expressed their consent to participate in the study. The men with hydrocele were examined in the supine position, and later scrotal ultrasonography was done.

Codman Accu-Flo hydrocephalus slit-valve catheters provide an effective means for shunting excess cerebrospinal fluid from the ventricles of the brain to some other parts of the body. The catheter is made from medical-grade silicone rubber. It has a 1.3-mm inside diameter and 2.5-mm outside diameter and is 91 cm long. The cannula is 10.5 cm long. The Accu-Flo shunt system, including a full line of distal catheters, pressure valves, reservoirs, ventricular catheters, and connectors, is used for hydrocephalus shunting by neurosurgeons. We used the part of the distal catheter remaining after a hydrocephalus shunt for hydrocele shunting, making our procedure cost effective. For this purpose, the catheter was cut on the tip to shorten it to about 15 to 20 cm in length. This part was sterilized with ethylene oxide. To facilitate the flow of the hydrocele fluid from the parietal layer of the tunica vaginalis to the surrounding (subcutaneous) scrotal tissue, holes were opened on the catheter. The hydrocele fluid is absorbed by the lymphatic system. As a result of this system, it was possible to flow hydrocele fluid continuously from inside and around the catheter into the subcutaneous tissue. The silicone catheter was

From the Department of Urology, Selçuk University Faculty of Medicine, Konya, Turkey

Reprint requests: Mehmet Kılınç, M.D., Department of Urology, Selçuk Üniversitesi Tıp Fakültesi, Uroloji AD, Konya 42080, Turkey

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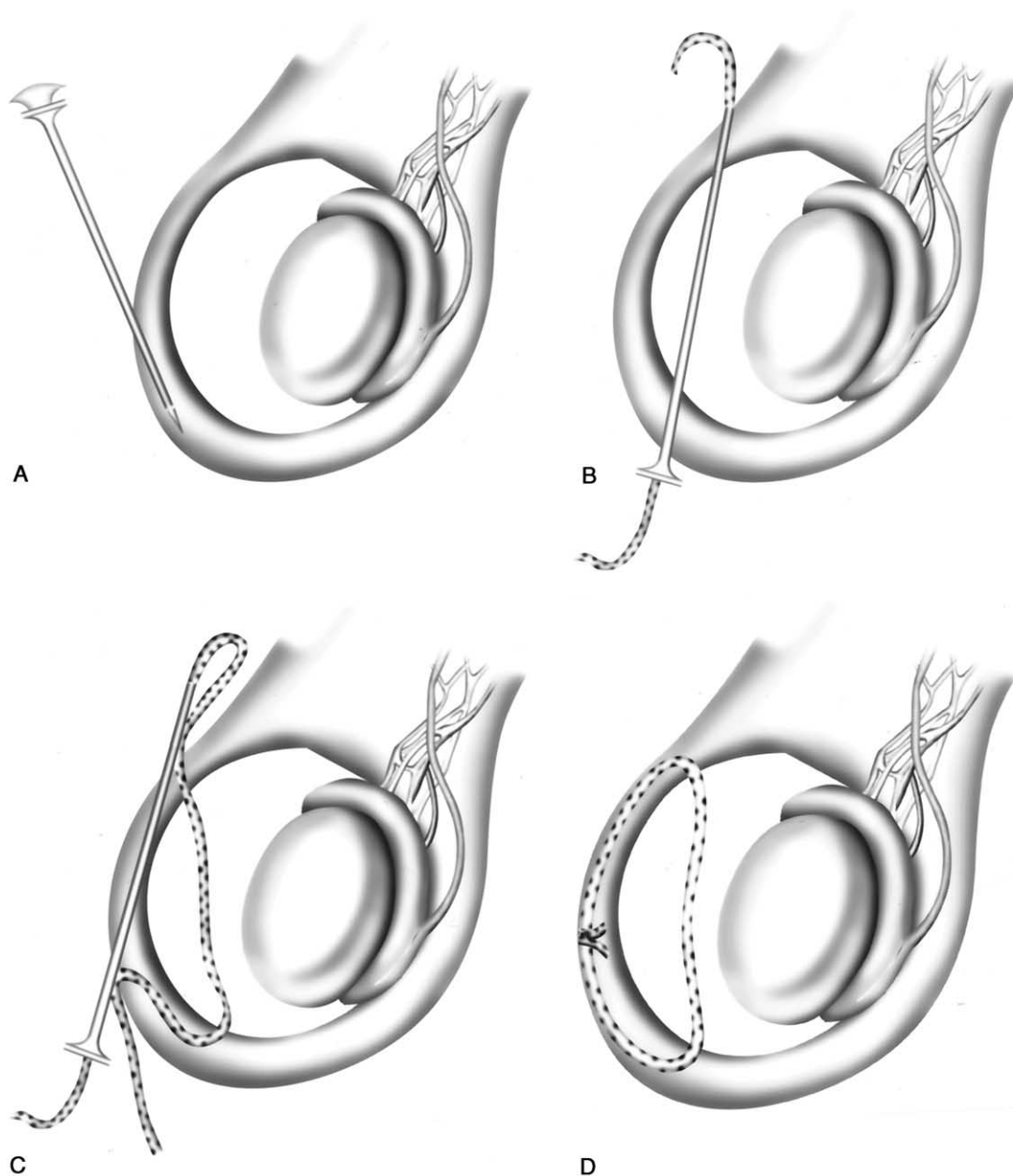


FIGURE 1. *Hydrocele treatment with silicone catheter. (A) Entrance and progression of cannula with obturator through scrotum to bottom of scrotum. (B) Progression of cannula in hydrocele sac. (C) Progression of silicone catheter to incision point by way of the cannula. (D) Sutured subcutaneous silicone catheter.*

kept permanently in the scrotal tissue. All the patients' histories were recorded. Patients with inguinal hernia, suspected malignancy of scrotal contents, persistent processus vaginalis, and acute inflammation were excluded from the study.

Local anesthesia was applied to the spermatic cord and to about 3 cm above and below the middle part of the scrotum. The drained side of the scrotum was held with thumb and fingers so that the scrotum became tense and prominent. At the same time, this manipulation can provide easy entrance of the cannula and helps in emptying the fluid completely. An incision of about 5 mm was made on the anterior scrotal wall using a scalpel knife. The cannula with the obturator was inserted through the incised and anesthetized scrotal wall. The cannula was elongated about 3 cm through the scrotal tissue to the bottom of the scrotum. At this point, the cannula has entered

into the hydrocele sac (Fig. 1A). While the obturator was placed, the cannula was pushed forward in the hydrocele sac with a gentle rotation until reaching the upper scrotal wall. The obturator was then removed, and a silicone catheter with holes was passed through the cannula (Fig. 1B). The silicone catheter was then moved to the first entrance point by way of the cannula, and the catheter was sutured either tip-to-tip or side-to-side subcutaneously (Fig. 1C,D). We prefer to empty the hydrocele fluid with an angiocatheter before removing the cannula. If drainage is done with the silicone catheter, in the hydrocele sac, without the use of an angiocatheter, edema can develop in the scrotal tissue. The entire procedure was completed in about 15 minutes. A wound dressing was applied, and the scrotum was elevated by a light scrotal or suspensory bandage for 2 to 3 days. All patients received oral antibiotics

for 2 days. During the procedure, local anesthesia was used but analgesic injections were not done. Patients were usually discharged the same day of the procedure.

RESULTS

The procedure was done in 45 men. Follow-up examinations were done at 3-month intervals during 1 to 3 years. The procedure was successful in 33 (73%) of the 45 cases. However, recurrence occurred in 11 men within the first 3 months and later in 1 man 5 months after the procedure. Of the 12 men with recurrence, 5 had minimal bleeding into the sac during the procedure. Also, recurrence occurred in the patients with larger hydroceles.

The use of only the silicone catheter for drainage led to edema in the first 5 men. Later, we used the angiocatheter to empty the hydrocele fluid. Despite the use of the angiocatheter in the remaining 40 men, 3 developed edema. Thirty-seven men had minimal edema in the scrotum. Edema development was not considered a treatment failure. The patients with recurrent hydrocele underwent surgery with removal of the silicone catheter. The patients were not hospitalized. One patient had slight testicular pain and tenderness 1 month after the procedure. However, this patient did not accept removal of the silicone catheter. None of patients had infection of the deeper or superficial tissue or developed pyocele. Oral antibiotics were used for 2 days. All scrotums were cosmetically normal in appearance.

COMMENT

In published reports, many surgical techniques have been proposed for hydrocele treatment. The basic principle of these techniques is to provide drainage of the hydrocele fluid into the surrounding tissues (superficial to the parietal layer of the tunica vaginalis) and thereby to increase absorption. In Wilkinson's technique,³ a partial eversion of the sac was necessitated. Lord⁴ developed a technique in which the sac is plicated with catgut sutures after eversion. The other procedures include Solomon's extrusion procedure,⁵ Nigam's window procedure,⁶ and Jaboulay's operation.⁶ In Solomon's extrusion procedure,⁵ the testis is extruded out of the scrotum and excess tunica vaginalis is sutured without excision or plication. Four flaps with a criss-cross incision are everted in Nigam's technique.⁶ Jaboulay's operation (eversion of the sac with or without partial excision of sac) is the most commonly used technique to treat hydrocele.⁶ These surgical procedures are based on drainage of the serous fluid through the lymphatics of neighboring tissues of the outer coverage of the testis and tunica vaginalis. In addition to these surgical techniques, sclerotherapy with tetracy-

cline is an alternative treatment for hydrocele. However, sclerotherapy with tetracycline has been associated with chemical epididymitis and peritonitis and should be avoided in young children with hydrocele.^{1,7} It has been reported that the pain during sclerotherapy is usually not incapacitating; however, in a substantial number of patients, it was moderate to severe.^{1,7} The side effect noted after injection of the sclerosant is immediate pain.¹ In the present study, no patients reported testicular pain or tenderness, except for one with slight testicular pain and discomfort. Most of the surgical procedures involve extensive dissection of the scrotum and its contents, resulting in a high incidence of hematoma formation, postoperative pain, and testicular atrophy. In the Jaboulay operation, edema and swelling occurred in 91% of patients, hematoma in 22%, and infection in 14%.⁸ Lord's procedure has resulted in a somewhat lower incidence of complications; however, several closed pockets can lead to recurrence.⁸ In the present technique, no injury occurred to the vas epididymal apparatus or testis. Complications such as hematoma, tissue infection, abscess as a secondary infection after hemocele, scrotal edema without hemorrhage, and orchitis usually did not develop. During the procedure, scrotal edema developed in the first 5 cases. Using an angiocatheter instead of a silicone catheter to drain the hydrocele fluid might reduce this incidence. In the present technique, the testis is also not taken out of the scrotum, an open procedure is not necessary, and the testis is not handled. Although it has not been reported in previous studies, it is possible that testicular and spermatic cord torsion can occur after removal of the tunica vaginalis by either eversion or extrusion procedures. However, because the testis is not taken out of the scrotum during our procedure, such as occurs in the window operation technique, testicular and spermatic cord torsion are not possible. In other surgical techniques, too much tissue handling and dissection are the major drawbacks. In contrast, in our technique, the incision is small and little handling occurs.

The recurrence rate depends on different factors such as age, hydrocele size, and hydrocele management.^{1,7} Multiple treatments may be required.^{1,7} However, discrepancy exists among the published reports concerning recurrence. In the Jaboulay operation, recurrence is due to the uneverted small upper position of the sac.⁸ In Wilkinson's procedure, partial eversion of the sac does not eliminate the risk of recurrence.⁸ McGow and Howley⁹ reported no recurrence with Solomon's extrusion procedure. Nigam⁶ reported no recurrence in 240 patients after the window operation. In contrast, Green¹⁰ reported that Nigam's procedure resulted in a 50% rate of recurrence owing to complete clo-

sure of the opening as a result of scar tissue formation. Sclerotherapy with tetracycline or other chemical agents, although less invasive, has been reported to have a high recurrence rate.^{1,7,11} In the present study, the recurrence rate was 27%. However, the recurrence rate might be reduced through cautious application of the procedure, hindering bleeding if at all possible, because 5 of the 8 patients with recurrence had minimal bleeding during the procedure.

CONCLUSIONS

The present procedure does not necessitate dissection, incision, or manipulation of the scrotal contents. Furthermore, infection, edema, and pain in the postoperative period are minimized. In the light of the outcomes of the study, this procedure may be the first preferable method because of the low recurrence rate. Patients with recurrence should be considered for surgical therapy with removal of the silicone catheter.

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