Hydrocele, Nuck Hydrocele: Standard Procedure 24

Hitoshi Ikeda and Kazunori Tahara

Abstract

Congenital hydroceles are classified into communicating and noncommunicating according to the presence of a macroscopic communication between the hydroceles and free abdominal cavity. Simple high ligation of the hydrocele or patent processus vaginalis is effective treatment. Surgery is performed in patients whose hydroceles persist beyond 2 or 3 years of age and in patients with new hydrocele development after this period.

The principle of hydrocele surgery is to block the flow of ascites from the abdominal cavity to hydroceles. To achieve this, the hydrocele is ligated as high as possible at the level of the internal inguinal ring in communicating hydroceles, while the patent processus vaginalis is ligated as high as possible in noncommunicating hydroceles. The procedure of hydrocele surgery is basically the same as surgery for inguinal hernia repair. However, hydroceles or the patent processus vaginalis is thinner than the hernia sac, and it may be occasionally difficult to identify the patent processus vaginalis in hydrocele patients. Generally, hydrocele surgery is more difficult than hernia repair, and, therefore, meticulous and delicate skills are required. Late postoperative complications include wound infection and hydrocele recurrence.

Keywords

Congenital hydrocele • Testicular (scrotal) hydrocele • Hydrocele of the cord • Nuck hydrocele • Hydrocele surgery

Testicular hydrocele (scrotal hydrocele) and hydrocele of the cord in male patients and Nuck hydrocele in female patients are congenital hydroceles in which fluid is collected in the patent processus vaginalis or in the space surrounding the testis between the layers of the tunica vaginalis. The fluid originates from the abdominal cavity (ascites), and hydroceles are classified into communicating and noncommunicating according to the presence of a macroscopic communication between hydroceles and the free abdominal cavity (Fig. 24.1). In noncommunicating hydroceles, it is thought that there are microscopic communications between hydroceles and the abdominal cavity. Simple high ligation of the patent processus vaginalis is therefore effective in resolving hydroceles in patients with noncommunicating hydroceles.

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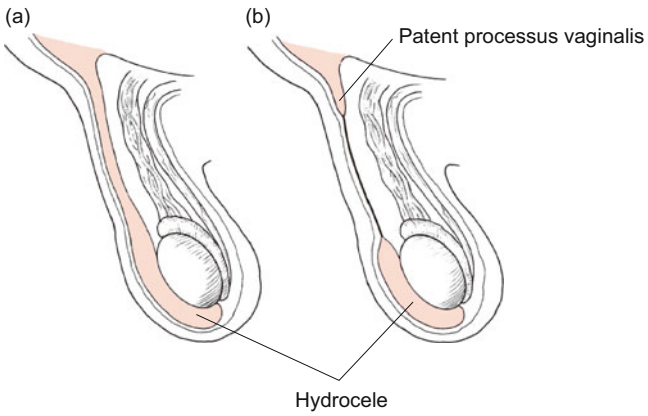

Fig. 24.1 Congenital hydroceles. (**a**) Communicating hydrocele. (**b**) Noncommunicating hydrocele

24.1 Timing of Surgery and Preoperative Management

In most patients with congenital hydroceles, hydroceles spontaneously resolve by the age of 12 months as a result of obliteration of the patent processus vaginalis. Therefore, surgical treatment is not indicated for infants younger than 12 months of age. Surgery is usually performed in patients whose hydrocele persists beyond 2 or 3 years of age and in whom spontaneous resolution of the hydrocele seems to be unlikely. Surgical treatment is also indicated in patients with new hydrocele development after this period.

Preoperative management is the same as that in inguinal hernia repair. In particular, the side to be surgically treated has to be marked preoperatively as in hernia repair, in order to prevent medical incidents or accidents.

24.2 Operations (Simple High Ligation)

The principle of hydrocele surgery is to block the flow of ascites from the abdominal cavity to the hydrocele. To achieve this, the hydrocele is ligated as high as possible at the level of the internal inguinal ring in communicating hydroceles, while the patent processus vaginalis is ligated as high as possible in noncommunicating hydroceles. The surgical procedure is basically the same as that for inguinal hernia repair. However, hydroceles or the patent processus vaginalis is thinner than the hernia sac, and it may be occasionally difficult to identify the patent processus vaginalis in hydrocele patients. Generally, hydrocele surgery is more difficult than hernia repair, and, therefore, meticulous and delicate skills are required. For hydroceles, the standard operation is open surgery, and laparoscopic surgery is rarely performed.

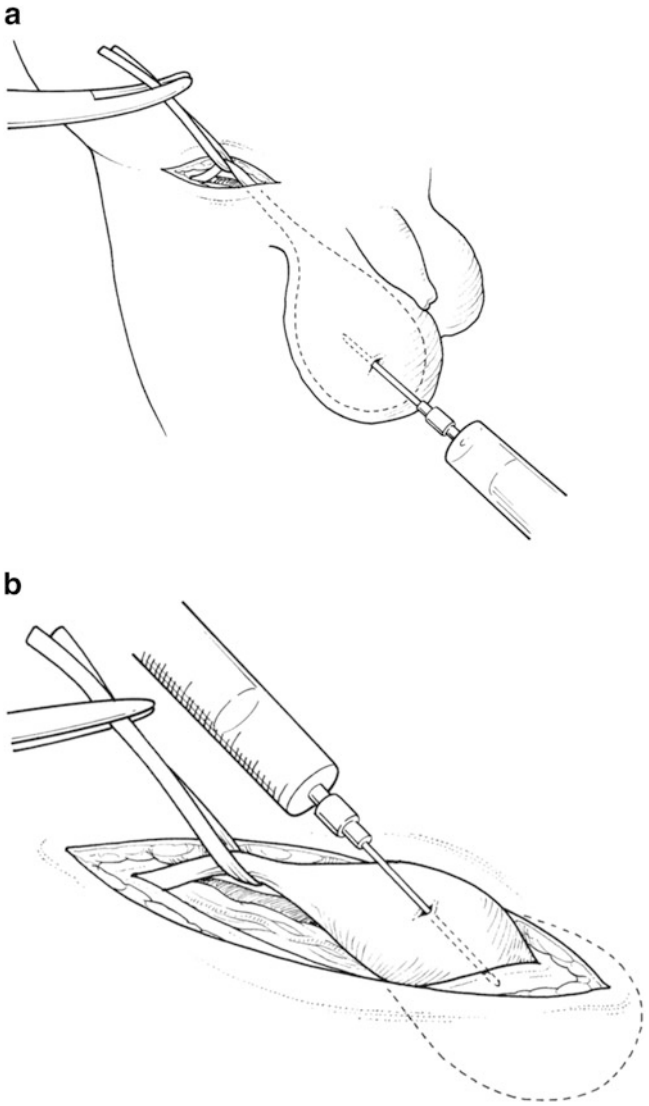

Fig. 24.2 Aspiration of the hydrocele. (**a**) Percutaneous or scrotal puncture. (**b**) Inguinal approach

24.2.1 Skin Incision and Approach to the Inguinal Canal

A skin crease incision, approximately 2–2.5 cm in length, is made just above the internal inguinal ring, which is similar to skin incision in inguinal hernia repair. Superficial fascias are bluntly separated, the external oblique fascia is incised, and the inguinal canal is exposed. The spermatic cord (the round ligament in female patients with Nuck hydrocele) is identified and elevated by taping. When the elevation of the spermatic cord is difficult due to the presence of a large hydrocele, the accumulated fluid in the hydrocele is aspirated by puncture and then the cord is pulled out of the wound (Fig. 24.2).

24.2.2 High Ligation of Hydrocele or Patent Processus Vaginalis

Blocking the channels of fluid flow from the abdominal cavity to hydrocele can be achieved by ligating the hydrocele or the patent processus vaginalis as high as possible at the level of the internal inguinal ring. The hydrocele is doubly ligated by transfixation with unabsorbable sutures in communicating hydroceles, and the patent processus vaginalis is similarly ligated in noncommunicating hydroceles. In male patients, the vas and testicular vessels are freed from the posterior wall of the hydrocele, and the hydrocele is transected before its proximal part is ligated (Fig. 24.3). In female patients, ligation is completed without transecting the hydrocele or patent processus vaginalis.

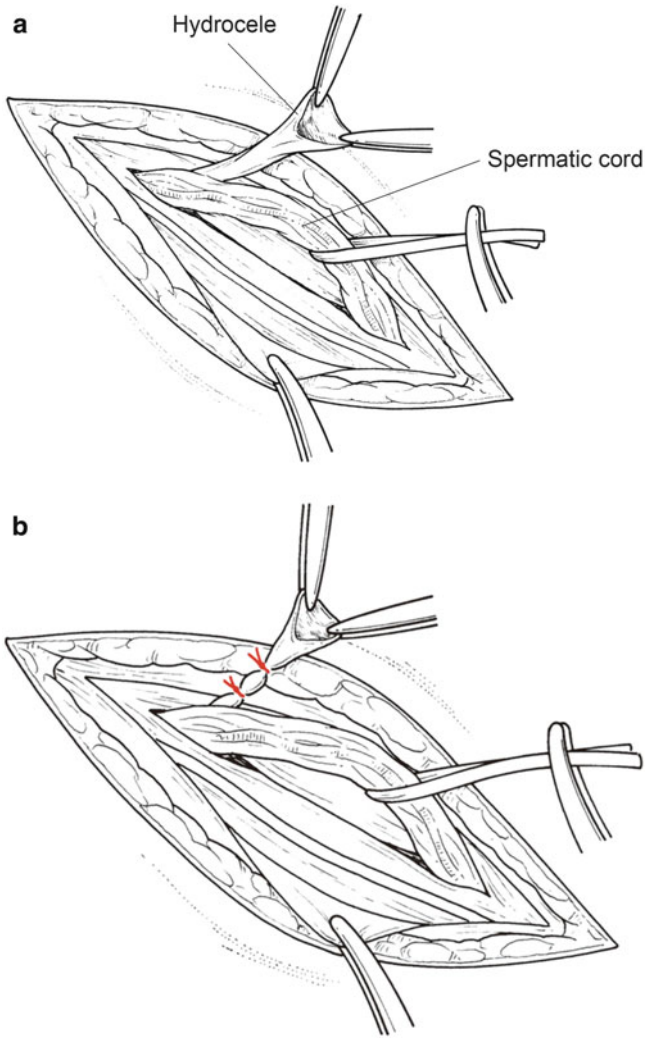

Fig. 24.3 Hydrocele surgery in male patients. The hydrocele or patent processus vaginalis is transected and doubly ligated at the level of the internal inguinal ring. (**a**) Identification and dissection of the hydrocele. (**b**) Double ligation of the hydrocele

24.2.3 Special Attention to Dissection

Hydrocele surgery is more delicate than hernia repair because the thin hydrocele or small, thin processus vaginalis has to be dissected. In particular, the thinnest part of the processus vaginalis where the vas is attached is easy to tear. Therefore, attention should be paid when dissecting the vas from the patent processus vaginalis. Actually, similar attention should be paid in inguinal hernia repair, because dissection of the vas from the hernia sac is not easy. If the hydrocele or patent processus vaginalis is torn near or beyond the internal inguinal ring, the deep end of the tear is grasped with a hemostat and then repaired by interrupted 5-0 absorbable sutures (Fig. 24.4).

24.2.4 Drainage of Distal Hydrocele

Since fluid flow from the abdominal cavity to hydrocele is blocked by high ligation, the distal fluid will disappear postoperatively by absorption without drainage. However, in order to meet parents' expectations that all hydroceles should be removed, the distal hydrocele is opened and the

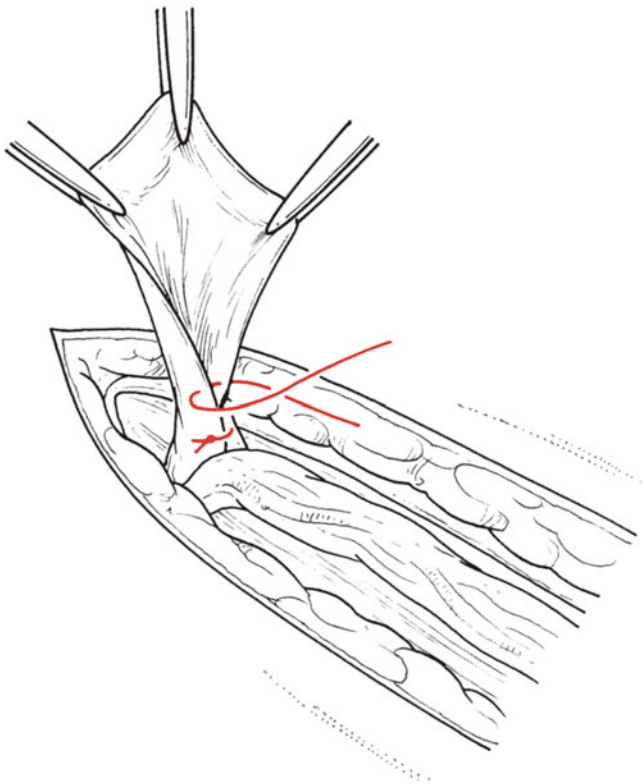

Fig. 24.4 Repair of the hydrocele (or patent processus vaginalis). Particularly the thinnest part of the processus vaginalis where the vas is attached is easy to tear. The tear can be repaired by interrupted sutures with 5-0 absorbable sutures

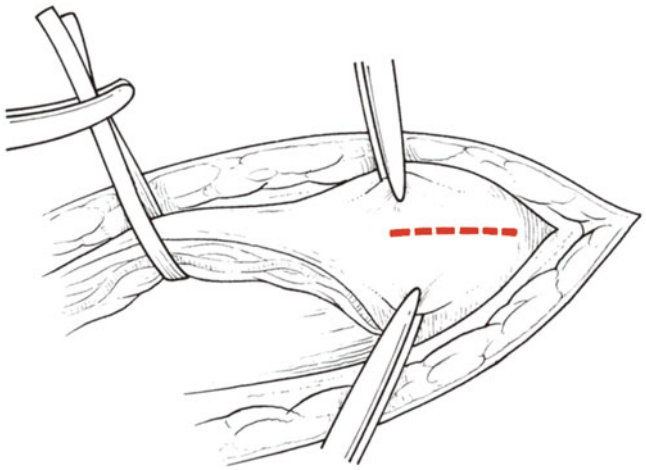

Fig. 24.5 The distal hydrocele is pulled out of the wound, grasped with hemostats, and opened to drain the fluid

accumulated fluid is drained before the wound is closed. In a noncommunicating hydrocele, the distal hydrocele is pulled out of the wound and grasped with hemostats. Then, it is opened by an incision and the fluid is drained (Fig. 24.5).

When a distal hydrocele is large and it is difficult to pull it out of the wound, the volume of distal fluid is decreased by a percutaneous puncture or puncture through the scrotal skin. After that, it can be approached and opened under direct vision through the wound. Because there are many tiny vessels in the walls of hydroceles, bleeding from the incisional site of the hydrocele should be stopped by coagulation or ligation. When the cavity of the hydrocele is separated by necks or septa, multiple incisions may be necessary to drain the accumulated fluid. Fluid aspiration instead of multiple incisions can be performed.

24.2.5 Wound Closure

The external oblique fascia and superficial fascias are closed by interrupted absorbable sutures. The skin is closed by subcuticular absorbable sutures.

24.3 Postoperative Management

General anesthesia-related complications and hemorrhage may occur during the first 24 h after hydrocele surgery. Late postoperative complications include wound infection and hydrocele recurrence.