

Use of a Novel Open Posterior Wall Technique for Laparoscopic Excision of Hydrocele of the Canal of Nuck in an Adult Female: Case Report

Naoto Chihara¹, Nobuhiko Taniai¹, Hideyuki Suzuki²,
Ryosuke Nakata¹, Mio Shioda¹ and Hiroshi Yoshida³

¹Department of Gastrointestinal and Hepato-Biliary-Pancreatic Surgery, Nippon Medical School Musashi Kosugi Hospital, Kanagawa, Japan

²Department of Gastrointestinal and Hepato-Biliary-Pancreatic Surgery, Nippon Medical School Chiba Hokusoh Hospital, Chiba, Japan

³Department of Gastrointestinal and Hepato-Biliary-Pancreatic Surgery, Nippon Medical School, Tokyo, Japan

Complete surgical excision is the standard treatment for hydrocele of the canal of Nuck. We developed a novel open posterior wall technique for laparoscopic transabdominal pre-peritoneal (TAPP) excision. A 38-year-old woman with a 5-month history of a painless reducible lump in the right groin had recently noticed a slight increase in the size of lump. Computed tomography showed a simple cystic lesion measuring 30 × 27.5 mm. We performed laparoscopic excision of the hydrocele by using the TAPP approach and the open posterior wall technique developed by us. Complete excision of the hydrocele was satisfactorily performed because the region from the external inguinal ring to the periphery could be clearly observed. After an uneventful postoperative course, the patient was discharged. Laparoscopic TAPP excision with open posterior wall technique was useful for complete excision of hydrocele of the canal of Nuck. (*J Nippon Med Sch* 2019; 86: 345–348)

Key words: hydrocele, canal of Nuck, laparoscopy

Introduction

Hydrocele of the canal of Nuck in females is similar to hydrocele of the spermatic cord in men but is rare in adult females. Incomplete obliteration resulting in trapped fluid in the peritoneal remnant is called hydrocele of the canal of Nuck, and failed obliteration may result in inguinal hernia^{1,2}. Complete surgical excision of the hydrocele, conventionally performed by open surgery via an anterior approach, is the standard treatment for this condition. Although recent reports have described cases of laparoscopic excision by transabdominal pre-peritoneal (TAPP) and totally extraperitoneal (TEP) approaches^{3,4}, the anatomic position of the inguinal canal obscures a linear field of view. In addition, dissection of the distal end of the hydrocele through the inguinal canal poses a challenge. We encountered incomplete excision with a laparoscopic approach and therefore devised a novel open posterior wall technique. This report describes a case of hydrocele of the canal of Nuck treated

with a laparoscopic TAPP approach.

Case Presentation

A 38-year-old woman was referred to our hospital for evaluation of a suspected groin hernia. She presented with a 5-month history of a painless reducible lump in the right groin, which had recently slightly increased in size. At presentation to our institution, the palpable groin lump could be reduced manually. Computed tomography showed a simple cystic lesion measuring 30 × 27.5 mm in diameter (**Fig. 1**). On the basis of these findings, we diagnosed hydrocele of the canal of Nuck, while considering the possibility of concurrent inguinal endometriosis. Laparoscopic TAPP excision of the hydrocele was performed by using open posterior wall technique.

TAPP excision was done with the patient under general anesthesia. The procedure used was as follows. The first port was created in the umbilicus. In addition, two working ports were created bilaterally, one on each side

Correspondence to Naoto Chihara, Department of Gastrointestinal and Hepato-Biliary-Pancreatic Surgery, Nippon Medical School Musashi Kosugi Hospital, 1-396 Kosugi-cho, Nakahara-ku, Kawasaki, Kanagawa 211-8533, Japan

E-mail: naotochihara@nms.ac.jp

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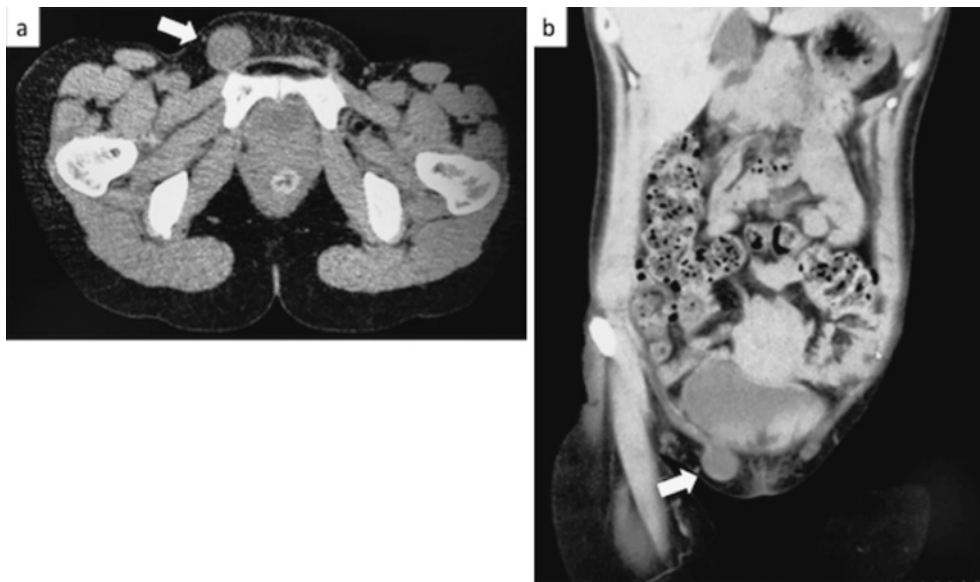


Fig. 1 CT image showing a fluid-density mass lesion (arrow).
a: Transverse image, b: Coronal image



Fig. 2 Intraoperative image showing the external inguinal hernia.

of the umbilicus. CO₂ insufflation pressure was set at 8–10 mm Hg. Intra-abdominal observation revealed an indirect inguinal hernia, but did not confirm the presence of a hydrocele (Fig. 2). For the peritoneal incision, laparoscopic coagulating shears were used. After dissecting the pre-peritoneal space, the central side of the right round ligament was dissected (Fig. 3, 4a). The hydrocele was carefully dissected towards the distal side, partially through the inguinal canal. Then, the posterior canal wall was opened in the region of Hesselbach's triangle (Fig. 3, 4b). The dissected central side of the round ligament was pulled through the opened posterior wall into the pre-peritoneal space. Thus, a good linear field of view was obtained, which enabled dissection up to the periphery.

Then, the distal hydrocele was dissected and resected, along with the round ligament (Fig. 3, 4c). After complete excision of the hydrocele, the inguinal ring external to the periphery could be clearly visualized on laparoscopy. The posterior wall of the inguinal canal was closed with an intracorporeal suture (Fig. 3, 4d). A prosthetic mesh was inserted directly into the pre-peritoneal space to prevent hernia recurrence (Fig. 3, 4e). The peritoneum was closed with a 3/0 multifilament absorbable suture. Histopathological examination revealed hydrocele of the canal of Nuck and partial involvement of granulation tissue. After an uneventful postoperative course, the patient was discharged on the third postoperative day. At the present writing, 19 months after surgery, there is no evidence of recurrence of a mass in the inguinal region.

This study was conducted in accordance with the principles described in the Declaration of Helsinki. The study protocol was approved by the Ethics Committee of Nippon Medical School Musashi Kosugi Hospital (approval no.425-29-49).

Discussion

The canal of Nuck was first described by the Dutch anatomist Anton Nuck in 1691. Therefore, the processus vaginalis within the inguinal canal in females is called the canal of Nuck. Hydrocele of the canal of Nuck is rare in adult females and results from failed obliteration of the distal portion of the canal, which forms a fluid-containing sac⁵. The usual treatment is excision of the hydrocele via an open approach in the groin area and clo-

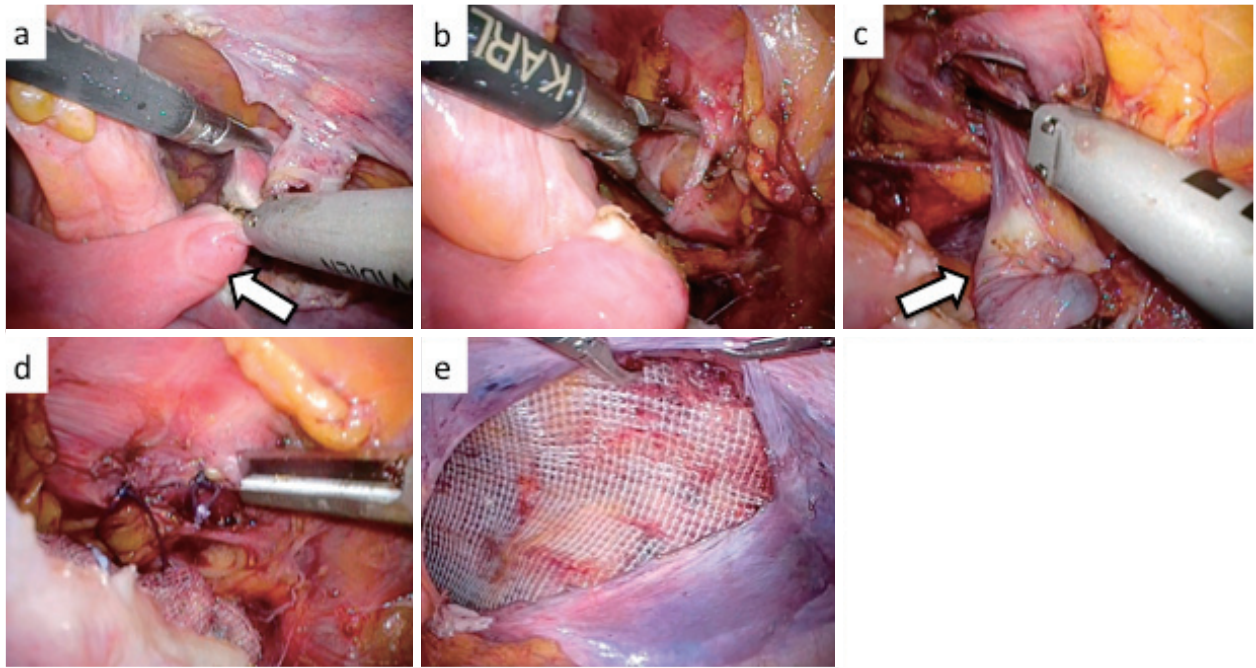


Fig. 3

- a: Dissection of the center of the right round ligament (arrow)
- b: Opening of the posterior wall of the inguinal canal near Hesselbach's triangle
- c: The hydrocele (arrow) is passed through the opened posterior wall
- d: Closure of the posterior wall of the inguinal canal with intracorporeal sutures
- e: A prosthetic mesh is placed in the pre-peritoneal space to cover the right myopectineal orifice

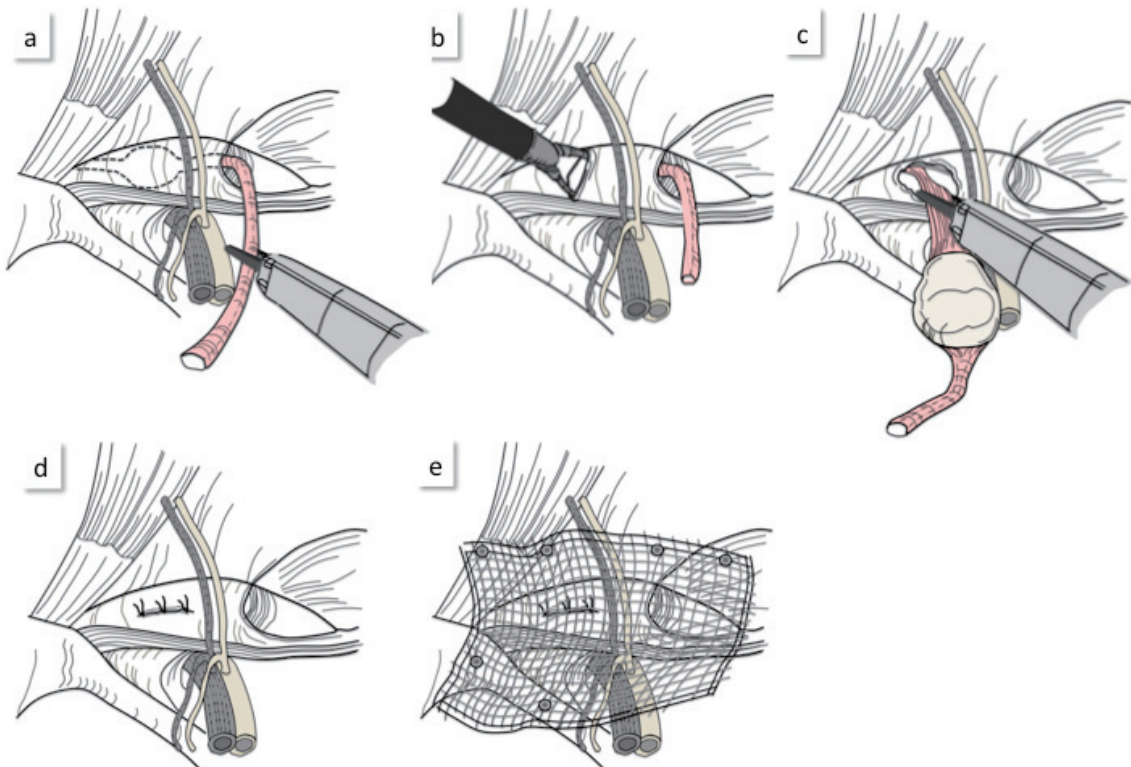


Fig. 4 Schematic illustration of Figure 3.

sure of the inguinal ring. However, it is difficult to examine the central aspect of the hydrocele with this approach. Although a laparoscopic approach allows adequate visualization of the central aspect, the peripheral aspect of the hydrocele is difficult to observe.

After experiencing a case of recurrence after incomplete excision by a laparoscopic approach, we devised the open posterior wall technique. Blunt dissection of the posterior wall of the inguinal canal can be performed by using dissecting forceps, without the need for an electric scalpel or laparoscopic coagulating shears, and the peripheral aspect of the hydrocele can be directly observed during dissection. Care must be taken to avoid damaging the hydrocele. We closed the opened posterior wall of the inguinal canal with an intracorporeal suture, but it was unclear whether the opened posterior wall was closed, because a prosthetic mesh had been used.

Lesions are usually small, typically about 3 cm in length on average⁶. In our experience, one case of hydrocele extended to the central region. We believe that complete resection with a laparoscopic approach is indicated in cases of peripheral and central involvement. Two reports described patients with a large, unstable mass in the labia majora^{7,8}. In such cases, treatment with a combined laparoscopic/open approach should be considered.

Scott and Te Linde analyzed 516 cases of endometriosis, only four (0.8%) of which were inguinal endometriosis. Among these four cases, the lesion involved the inguinal portion of the round ligament in three cases and the canal of Nuck in one case⁹. Some researchers have reported cases of inguinal endometriosis and the difficulty of diagnosing this condition^{10,11}. Hydrocele of the canal of Nuck should be included in the differential diagnosis of such cases. In our experience, after excision of the hydrocele, histopathological examination often reveals inguinal endometriosis. Therefore, it is essential to open the posterior wall, without injuring the hydrocele, dissect up to the peripheral aspect of the inguinal canal, to the extent possible, and use forceps to direct the hydrocele through the inguinal canal towards the opening of the posterior wall. However, an external inguinal hernia in which the hernial sac simply contains ascites, without hydrocele of the canal of Nuck, is sometimes observed. Laparoscopic

observation is therefore important.

In conclusion, laparoscopic TAPP excision with open posterior wall technique was useful for complete excision of hydrocele of the canal of Nuck.

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Conflict of Interest: The authors declare no conflicts of interest.

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