CASE REPORT

Concomitant closure of patent canal of Nuck during laparoscopic surgery

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Indirect inguinal hernia is neglected by many female patients. When women undergo laparoscopy for infertility work-up or other gynaecological conditions, the hernia appears pressurized by the pneumoperitoneum. A large opening on the peritoneum followed by the patent canal of Nuck—as seen in the patient in this case report—is accompanied by a bulge above the labia major. This situation was treated with simple ligation of the canal of Nuck from the internal inguinal ring, and the vulvar bulging mass quickly disappeared, even while under pneumoperitoneal pressure. Laparoscopic hernia repair is currently performed with a mesh prosthesis to cover the defect; however, in female patients it seems unnecessary to use such an invasive method designed largely for males. According to our experience, the concomitant simple closure method for female indirect inguinal hernia is a quick and simple procedure, and deals with the problem during the same laparoscopy. In addition, disappearance of the bulging mass under the pneumoperitoneum offers a useful diagnostic test to secure hernia management.

Key words: canal of Nuck/inguinal hernia/laparoscopic surgery

Introduction

The most frequent symptom of female inguinal hernia is a non-tender, reducible bulging mass located above the labia major, where the canal of Nuck terminates. Such a bulging mass may not be painful, and the patient’s attention may not be drawn to the situation; consequently, inguinal hernia often remains untreated. When patients undergo laparoscopy for other gynaecological conditions, the vulvar mass bulges under pneumoperitoneal pressure, revealing unexpectedly a patent canal of Nuck and an inguinal hernia that requires surgical correction. A case is presented of our experience in dealing with this condition.

Materials and methods

A 23-year-old unmarried woman, gravida 0, para 0, was hospitalized for laparoscopic surgery on a progressively enlarged ovarian cyst. The cyst had been followed up for more than 1 year, and measured 7 cm in diameter. During the follow-up period, the patient also mentioned a reducible mass which had been present for a long time above her right labia major. This bulging mass always appeared gradually when she stood for an extended period of time, enlarged when she was carrying heavy items or when she squatted down, but reduced when she was in a supine position. An outline diagnosis of inguinal hernia was made. As the hernia caused no pain or tenderness, was reducible, and appeared not to interfere with her daily life, a concomitant repair of the inguinal hernia was planned with laparoscopic surgery for the ovarian cyst.

As in standard procedure, the laparoscope was introduced through the umbilicus after establishing a pneumoperitoneal pressure of 15 mmHg. Two additional 5 mm accessory ports were placed through each lower quadrant. A standard laparoscopic enucleation of the ovarian cyst was then carried out, with appropriate haemostasis. Sutures were used to close the remaining ovarian tissue.

Identification of the inguinal hernia

A large opening was noted on the peritoneum at the ventral margin of the right round ligament, followed by the canal of Nuck passing into the pelvic wall (Figure 1). At the same time, a cystic bulge was noted above the right labia major, at about the location of the pubic tubercle (Figure 2). This bulge could be enlarged or reduced by adjusting the pneumoperitoneal pressure from 0 mmHg to 20 mmHg, indicating that the canal of Nuck was patent.

Technique of hernia repair

With the aim of ligating the canal of Nuck on the internal inguinal ring, two 1-0 polypropylene sutures were placed, using an intraperitoneal approach. First, the anatomic relationships of the pubic bone, the round ligament and the iliac vessels were identified, in order to avoid injury to the external iliac vessels. Having teased out the round ligament, the surgeon placed the first suture at about the level of the canal of Nuck and an inguinal hernia that requires surgical correction.

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Figure 1. A large opening of the patent canal of Nuck was identified on the peritoneum, above the right round ligament.

Figure 2. Pneumoperitoneal pressure caused a cystic bulge to develop on the right labia major.

the canal. After tying up the node, the canal of Nuck was ligated together with the round ligament. At this point, the bulge above the labia major disappeared, even when the pneumoperitoneal pressure was raised to 25 mmHg. This confirmed closure of the canal. A second suture was then placed at the level behind the peritoneal opening of the canal in order to reinforce the closure.

The operating time to complete the two sutures was <8 min. Postoperative pain was minimal, and the patient was discharged from hospital in 20 h. After 2 years follow-up the patient was well and without any sequelae, the bulge above the labia major having never recurred.

Discussion

Although less common than in males, inguinal hernias may occur in females. During fetal development, the inguinal canal is formed by the processus vaginalis, an evagination of peritoneum, and descends on each side of the abdomen to the labiosacral swellings. In female fetuses, however, the processus vaginalis usually occludes and disappears long before birth. If the closure fails, a persistent process—called the ‘canal of Nuck’—offers a pathway from the pelvic cavity to the labia major. This opening may sometimes be seen at laparoscopy, but few gynaecologists notice that the patent canal might elicit the occurrence of inguinal hernia.

An untreated reducible hernia has the potential to develop into an incarcerated hernia; therefore most surgeons suggest that the hernia is best repaired as soon as a reducible mass is noticed. With the conventional anterior herniorrhaphic method, not only is a larger skin incision required but the postoperative recovery is also lengthy and painful, owing to the delicacy of the tissues manipulated during surgery and the anatomic tension created by the repair. The current techniques of laparoscopic hernia repair are usually carried out with a mesh prosthesis in order to cover the defect in a tension-free manner, to prevent recurrence of tissue attenuation of the repair, and to reduce postoperative pain. The most popular laparoscopic herniorrhaphic procedures include an intraperitoneal onlay mesh (IPOM) technique, a transabdominal preperitoneal (TAPP) approach, and a totally extraperitoneal (TEP) approach (Fitzgibbons et al., 1995; Liem and van Vroonhoven, 1996). A randomized, multicentre trial has been performed which concluded that patients who underwent the TEP technique recovered more rapidly and had fewer recurrences (Liem et al., 1997). However, the mesh prosthesis is a material which evokes a marked tissue reaction and may induce severe pelvic adhesion; the mesh may also, on occasion, migrate across the peritoneum. Complications caused by mesh, including bowel obstruction (McDonald and Chung, 1997), mesh infections (Avtan et al., 1997) and mesh migration into bladder (Hume and Bour, 1996) have been reported when using the TAPP approach. Bowel obstruction has also been reported in TEP (Eugene et al., 1998).

In the past, these hernia repair procedures have been designed mainly for use in male patients, and earlier reports of female inguinal hernia have emphasized the different, albeit stronger, inguinal anatomy of females (Glassow, 1973; Spangen, 1995). During development of the female fetus, the processus vaginalis has no testes through which to pass, and contains no spermatic cord except for the gubernaculum, which later becomes the round ligament of the uterus. Thus, most female inguinal canals have fewer weak points, and hence inguinal hernias are of a milder form than those found in males. It is doubtful whether it is necessary to use such complicated and invasive methods to repair a mild female indirect inguinal hernia, especially when the hernia (though symptomatic) has usually been neglected by the patient herself. However, concomitant simple closure of the inguinal canal is a quick and simple way to deal with the problem during the same laparoscopic operation, and disappearance of the bulging mass under pneumoperitoneal pressure offers a good test to confirm complete occlusion of the patent hernial canal. In comparison with traditional anterior herniorrhaphy, the laparoscopic simple closure method provides better results and less postoperative pain. This is because it offers the highest ligation of the hernia sac by using an intraperitoneal approach, as well as a less invasive access, since the surgeon has no need to section a thick layer of fat and muscle. Unlike the laparoscopic mesh hernioplastic method, the simple closure method reported here does not require dissection of the extraperitoneal space, and also eliminates the possibility of mesh infection and severe
adhesion or bowel obstruction which may be caused by mesh migrating into the abdominal cavity.

In short, the previously neglected female indirect inguinal hernia with open canal of Nuck may be revealed unexpectedly during laparoscopy for diagnostic work-up of infertility or other gynaecological conditions. The hernia may be cured by simple closure of the internal inguinal ring during the same laparoscopic surgery. Disappearance of the vulvar bulging mass under pneumoperitoneal pressure confirms complete closure of the patent canal of Nuck. Overall, the technique involves straightforward surgery, a minimal degree of invasiveness, and virtually no postoperative discomfort. The outcome of this approach has been satisfactory over a 2-year follow-up period.

References


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