

A right sliding indirect inguinal hernia containing paraovarian cyst, fallopian tube, and ovary: a case report

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Received: 21 May 2008 / Accepted: 15 September 2008 / Published online: 4 October 2008
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Abstract Albeit very uncommon, the hernia sac may contain unusual structures such as vermiform appendix, acute appendicitis, ovary, fallopian tube and, urinary bladder. Most of the cases of hernia containing ovary and fallopian tubes were reported to be found in children and, often accompanied with other congenital anomalies of genital tract. We present the first case of sliding inguinal hernia containing right ovary and fallopian tube and a right paraovarian cyst in 80-year-old, multiparous patient without any associated genital anomaly. The hernia was repaired with plication darn, while the paraovarian cyst was excised and adnexa were preserved. It is of utmost importance to keep in mind that the hernia sac may contain almost any abdominal organ, and surgical dissection should be carried out accordingly. Pathophysiologically, the ovary might be simply pulled along with a sliding paraovarian cyst or the paraovarian cyst might be accompanying the maldescended ovary. There seems to be a need for clinical and experimental studies to further explain the mechanisms that apply to the pathogenesis of sliding inguinal hernias.

Keywords Sliding inguinal hernia · Paraovarian cyst · Fallopian tube · Hernia sac content

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Introduction

The hernia sac may contain structures such as ileum, jejunum, colon, omentum, vermiform appendix, acute appendicitis, Meckel's diverticulum, stomach, ovary, fallopian tube and, urinary bladder [1, 2]. Although rarely encountered, most of the cases of inguinal hernia containing ovary and fallopian tubes were reported to be found in children and, often accompanied with other congenital anomalies of genital tract [3]. We present a case of sliding type of right inguinal hernia containing right ovary and fallopian tube and a right paraovarian cyst in an elderly patient without any associated genital anomaly. A medline search using the terms 'inguinal hernia, fallopian tube, ovary, paraovarian cyst' revealed that only two cases of inguinal hernias containing paraovarian cyst [4, 5] have been reported, and this is the first report of sliding inguinal hernia containing ipsilateral ovary and fallopian tube and a paraovarian cyst in an adult patient.

Case report

A 80-year-old multiparous patient presented with complaints of a swelling in her right groin and occasional pain. She reported that the swelling was present for almost 50 years and she was managing to push it back until recently. She was also admitted for an increase in the size of the swelling in the last couple of years. Her medical history was unremarkable except for hypertension and congestive heart failure, both of which were under control with medical therapy.

On physical examination, a 6 × 4 cm non-reducible right groin hernia arising above from the inguinal ligament was noted. Ultrasound examination confirmed a cystic

structure measuring 6×3.5 cm within the hernia sac (Fig. 1), the patient was diagnosed as having predictable inguinal hernia, and was scheduled for elective operation under spinal anesthesia with an operative risk of American Society of Anesthesiologists, Class III. On the operation, it was observed that the lateral wall of the hernia sac was formed by right ovary, fallopian tube and paraovarian cyst (Fig. 2) Intraoperatively, uterus and ovary was evaluated as normal, and cystectomy was performed. In order to shorten the operative time and to avoid the potential morbidity associated with salpingooforectomy, the tube and ovary are reduced into the abdominal cavity and hernia was repaired with plication darn. Histopathological examination

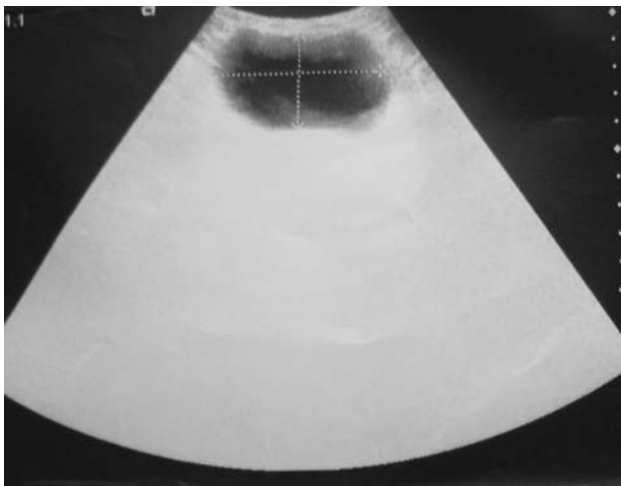


Fig. 1 An oblique sonographic section obtained from just over the inguinal swelling depicting the anechoic internal structure of the paraovarian cyst contained in the sac. Other associated structures such as the ovary and fallopian tube are indiscernible. Note the close proximity of cystic structure to the overlying skin with little space between convexity of the probe and cyst

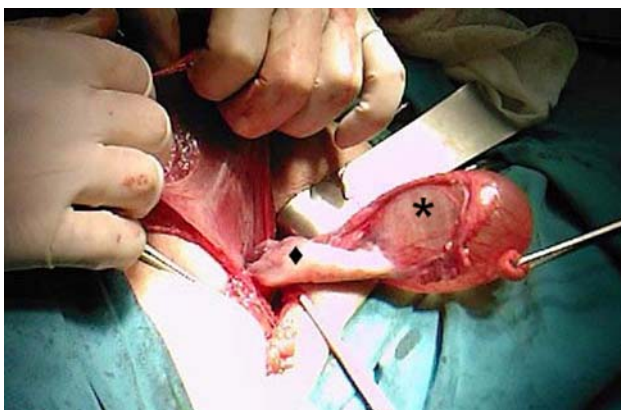


Fig. 2 Intraoperative view, after the hernia sac was exposed, showing the paraovarian cyst (*asterisk*), fallopian tube and ovary (*diamond*) forming the lateral wall of the hernia sac

proved that the cyst was formed by a single layer of flattened cuboid epithelium, a finding consistent with paraovarian cysts. The postoperative course was uneventful and the patient was discharged on fourth postoperative day.

Discussion

The occurrence of sliding hernia, containing a paraovarian cyst together with ipsilateral ovary and fallopian tube, necessitates the consideration of anatomy and embryologic development of related structures in order to understand more precisely the mechanism how it developed. Nearly, every intraperitoneal organ including the ovaries, fallopian tubes and parts of or all of uterus have been reported to find its way into the inguinal canal to present as inguinal hernia [1, 2]. The inguinal canal in the female is not well demarcated, but it normally gives passage to the round ligament of the uterus, a vein, an artery from the uterus that forms a cruciate anastomosis with the labial arteries, and extraperitoneal fat. The fetal ovary, like the testis, is an abdominal organ and possesses a gubernaculum that extends from its lower pole downward and forward to a point corresponding to the abdominal inguinal ring, through which it continues into the labia majora. Instead of descending, as does the testis, the ovary moves medially, where it becomes adjacent to the uterus. The intraabdominal portion of the gubernaculum ovarii becomes attached to the lateral border of the developing uterus, evolving as the ligament of the ovary and the round ligament of the uterus [6]. Hence, the development of indirect inguinal hernias is simply explained by prolapse of any intraabdominal organ through the inguinal ring together with round ligament. Interestingly, Ozbey et al. [7] challenged this common knowledge. They sampled the peritoneal tissues containing the round ligament in 15 female infants and children who underwent inguinal hernia repair, and concluded that localization of estrogen and progesterone receptors prove that the ligament is a target organ influenced by hormones. Since the round ligament is supposed to be the female gubernaculum that has an altered anatomy and localization because of absence of androgen responsiveness, they further speculated that its modified presentation in a processus vaginalis raises the suspicion that the ovary in a hernia sac may not simply be prolapsed, but is a descended organ.

Further complicating the matter, our case was presenting with two intra abdominal organs (ovary and fallopian tube), for which either of the abovementioned mechanisms could be applied in order to explain their development, together with a paraovarian cyst. The paraovarian cysts are usually incidental operative findings, which can be large, symptomatic and indistinguishable from ovarian cysts prior to surgical exploration. They arise either from mesonephric or

mesotelial or paramesonephric tissues. From an embryologic point of view, the fusion of the paramesonephric ducts brings together two folds of peritoneum, which become the broad ligament and divide the pelvic cavity into a posterior rectouterine and anterior vesicouterine pouch or cul-de-sac. Between the leaves of the broad ligament, mesenchyme proliferates and differentiates into loose areolar connective tissue and smooth muscle [8]. The most probable way for a paraovarian cyst to present as a groin hernia is its passage through the leaves of broad ligament. By the virtue of intraoperative finding, one wall of the hernia was consisted of the paraovarian cyst, ovary and fallopian tube, and this hernia could be classified as sliding type. In several reported cases, the uterus also has been identified within a sliding inguinal hernia sac along with the ipsilateral fallopian tube and ovary [9]. It has been speculated that because there is no embryologic reason for uterus to herniate, there may be an abnormality of the suspensory ligaments of uterus to account for these cases [9]. The finding reported that in infant girls who are younger than 2 years, 31% of inguinal hernias contained fallopian tubes and/or ovaries, which support the idea of co-existence of a congenital abnormality [3]. This incidence decreases with age, as 70% of hernias with fallopian tubes and ovaries occur in patients younger than 5 years [10]. Despite longstanding presence of swelling complaints, there was no associated genital tract abnormality, in our case.

In conclusion, from a clinical point of view, it is of utmost importance to keep in mind that the hernia sac may contain almost any abdominal organ such as intestines, bladder, omentum, ovary, Fallopian tube, uterus, stomach, vermiform appendix, or Meckel's diverticulum [1, 2]. Providing a detailed differential diagnosis helps to plan the surgery. For this purpose, a detailed history and a thorough physical examination are mandatory.

Despite the best efforts, the content of the hernia sac is usually disclosed intraoperatively. Careful surgical dissection should be done in order to avoid damage to vital organs, which may be contained in the sac.

Whether the herniated ovary was a result of simple prolapse or a descended gonad is a matter of question. The presence of a paraovarian cyst in addition to an ovary further complicates the matter. The ovary might be simply pulled along with a sliding paraovarian cyst or the paraovarian cyst might be accompanying the maldescended ovary. There seems to be a need for clinical and experimental studies to explain further the mechanisms that apply to the pathogenesis of sliding inguinal hernias.

Conflict of interest statement None.

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