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## Case report

### Rare hydrosalpinx in a sexually inactive adolescent successfully treated with laparoscopy

Masumi Takeda<sup>\*</sup>, Takashi Miyatake, Asuka Tanaka, Serika Kanao, Ai Miyoshi, Mayuko Mimura, Masaaki Nagamatsu, Takeshi Yokoi

Department of Obstetrics and Gynecology, Kaizuka City Hospital, Kaizuka, Osaka, Japan

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#### ABSTRACT

The majority of cases of symptomatic hydrosalpinx needing treatment are caused by sexually transmitted diseases. However, here, we present a rare case of a hydrosalpinx occurring in a sexually-inactive adolescent girl successfully treated with laparoscopy. A 17-year-old girl presenting with lower abdominal symptoms had a surgical history for an inguinal hernia at infancy. Transabdominal ultrasonography revealed a multicystic lesion in the pelvis, and magnetic resonance imaging suggested hydrosalpinx. Due to the abdominal pain and a suspicion of torsion, laparoscopic surgery was performed. After aspiration and resection of a cystic tumor, we confirmed that the left ovary was normal and that the tumor involved the left fallopian tube, which was twisted at the isthmus. Although relatively rare in postmenarchal sexually inactive adolescents, clinicians and surgeons must still consider hydrosalpinx as a possible diagnosis when encountering an adolescent patient with lower abdominal pain.

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## Introduction

Isolated hydrosalpinx is not a common diagnosis in post-menarchal sexually inactive adolescents,<sup>1</sup> because the majority of hydrosalpinx cases are reported to be associated with sexually transmitted pelvic inflammatory diseases, which occur most frequently in women during the most sexually active years.<sup>2–4</sup>

The primary differential diagnosis for lower abdominal pain in female adolescents should normally be either for acute appendicitis or ovarian torsion, both of which can be indications for emergency surgery.<sup>5</sup> The commonly occurring acute hydrosalpinx in adult women also often requires surgical intervention, largely due to the severe pain that accompanies it; however, this need not be emergency surgery because there is little reported risk of loss of a vital organ, perforation, or sepsis.<sup>6</sup>

The preoperative diagnosis of a hydrosalpinx for lower abdominal pain in an adolescent can be quite challenging.<sup>1</sup> This report describes a rare case of a 17-year-old girl with isolated

hydrosalpinx. The preoperative and intraoperative diagnosis was indeed difficult; however, after correct recognition of the pelvic condition, the lesion was successfully resected with laparoscopy.

## Case Presentation

A 17-year-old adolescent girl was admitted to our hospital with abdominal pain limited to the lower left quadrant, with no signs of pan-peritonitis. Her vital functions were within normal range. Menarche had taken place at 15 years of age, her menstrual cycle was a regular 30-day cycle, and the last menstrual period had started 25 days prior. She reported having no history of sexual intercourse.

The patient had first presented with acute abdominal pain to a physician, who detected an intra-abdominal mass. Her abdominal pain temporarily improved with oral nonsteroidal anti-inflammatory drugs (NSAIDs), and she was referred to our gynecologic department 5 days later. In the intervening 5 days, her acute abdominal pain subsided without NSAID use, but a mild lower abdominal pain persisted.

Physical examination confirmed tenderness in the lower left quadrant of the abdomen, without a rebound tenderness. Gastrointestinal symptoms, including nausea and vomiting, were not present. Her blood test and urine tests were within normal limits.

Conflicts of interest: The authors report no conflicts of interest.

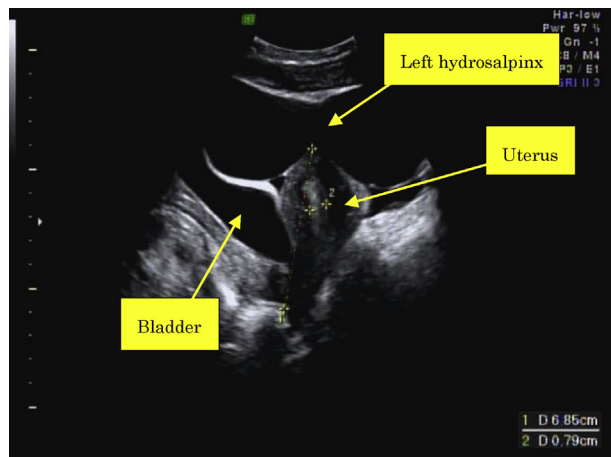
<sup>\*</sup> Corresponding author. Department of Obstetrics and Gynecology, Kaizuka City Hospital, 3-10-20 Hori, Kaizuka, Osaka 597-0015, Japan.

E-mail address: [pandamaaya@gmail.com](mailto:pandamaaya@gmail.com) (M. Takeda).

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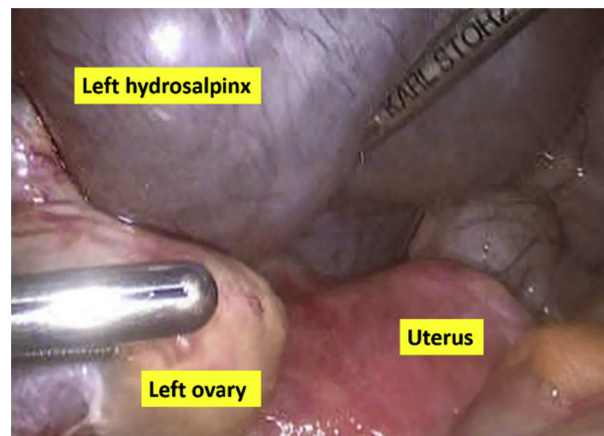


**Figure 1.** Transabdominal ultrasonography. Transabdominal ultrasonography revealed an intrapelvic cyst filled with clear fluid and intracystic septations in the left adnexal region. A normal uterus was described, and there was no ascites.

Transabdominal ultrasonography revealed a 10 cm × 8-cm intrapelvic cyst in the left adnexal region that was filled with clear fluid and intracystic septations. A normal uterus was described, and there was no ascites (Figure 1). A pelvic computed tomography scan also identified a septated cyst in the pelvis, leading us to suspect the mass might be a left ovarian tumor. However, pelvic magnetic resonance imaging (MRI) described the cyst as being a left fallopian hydrosalpinx (Figure 2).

We noted the presence of surgical scars in both her lower abdominal quadrants. We determined that she had a prior history of two operations conducted at 9 months and at 5 years of age to repair inguinal hernias, with the left-sided hernia of the ovarian-slippage type.

Laparoscopic surgery was performed to improve her pain symptoms, to ensure that torsion had not occurred, and to investigate the origin of the fallopian cyst. Intra-abdominal laparoscopic observation revealed that the uterus and the right adnexa were normal in appearance. We could not confirm the left adnexa due to the multiple cysts occupying the left pelvic space (Figure 3). The cystic lesion was assumed to be a left tubal torsion. In order to improve the field of view, we aspirated off a clear fluid

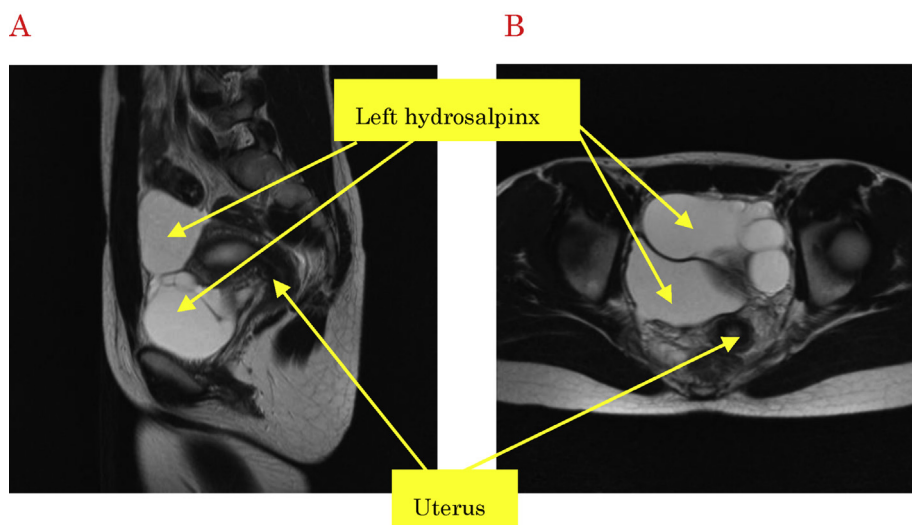


**Figure 3.** Intraoperative image taken during laparoscopic surgery. The multicystic lesion occupied the left pelvic space. After aspiration of serous fluid content, the left ovary, adjacent to the lesion, was confirmed. The lesion was confirmed to be a hydrosalpinx of the left fallopian tube, with a twisted isthmus.

from one of the cysts. The revealed tumor was observed to have spread into the left broad ligament. We performed a left salpingectomy and confirmed that the tumor was part of the swollen left fallopian tube (a multilocular-type hydrosalpinx) with an isthmus twist. The left tubal fimbria of the hydrosalpinx could not be identified due to severe adhesion of the lesion to the pelvic peritoneum, indicating that occlusion at the fimbria of the left fallopian tube was the origin of hydrosalpinx. The post-operative course of recovery was uneventful, and the patient was discharged on the 7<sup>th</sup> day.

## Discussion

Hydrosalpinx is defined as a distally blocked and dilated fallopian tube filled with serous or clear fluid. It is generally seen after pelvic inflammatory disease (PID), commonly as a result of an ascending infection of *Chlamydia trachomatis* or *Neisseria gonorrhoeae*.<sup>2</sup> Therefore, it is more commonly seen in women of reproductive age who are sexually active, with an even higher risk for those with a history of PID. However, the patient in the present case was a sexually inactive adolescent with no history of PID.



**Figure 2.** Preoperative pelvic MRI T2-weighted images showing the (A) sagittal section and (B) transverse section. MRI indicated that the cause of the lower abdominal pain was an intrapelvic, multilocular, high-intensity lesion, a swollen fallopian tube with fluid content, considered to be a left hydrosalpinx. MRI = magnetic resonance imaging.

A hydrosalpinx with a tubal torsion requiring surgery is quite rare in pediatric aged girls, and its pathogenesis is unclear in the literature.<sup>3,7</sup> There are several identified risk factors for tubal torsion, including PID, prior pelvic surgery, previous ectopic pregnancy, endometriosis, and paratubal cysts. These risk factors are generally very rare in adolescent girls; however, our patient had a history of bilateral inguinal hernia surgery, which is a known risk for both hydrosalpinx and tubal torsion.<sup>8</sup>

The surgical record of the patient suggested that her early childhood left-side hernia was of the ovarian-slippage type. The left tubal fimbria might have coalesced into the retroperitoneal space following the childhood inguinal surgical procedure, resulting in blockage of the left fallopian tube patency and eventually causing the hydrosalpinx.

There is a broad spectrum of possible causes of abdominal pain in female adolescents. Among cases of abdominal pain without accompanying inflammatory change and/or acute abdomen sign, the three most common causes are constipation, menstrual pain, and ovarian tumor.<sup>9</sup> Other common gynecological diseases of older women are quite rare in pediatrics.<sup>9</sup> Ovarian tumors are relatively easy to diagnose using transabdominal ultrasonography with a view of the intrapelvic lesion. However, as in the present case, it may be difficult to accurately preoperatively differentiate a hydrosalpinx from an ovarian tumor using transabdominal ultrasonography. MRI is reported to be much more useful for making this distinction; however, MRI is not always performed in an emergency scenario.<sup>10</sup>

There are multilocular and unilocular types of hydrosalpinx. The salpingoneostomy is a possible surgical procedure used for correcting the unilocular type; however, it is not nearly as useful for the multilocular type,<sup>3</sup> and the effectiveness of salpingoneostomy for the preservation of reproductive potential remains unclear. There is little or no literature to support the use of salpingoneostomy in adolescents. We were, therefore, concerned that the procedure might have a potentially negative impact on tubal function and future fertility of our patient.<sup>3</sup> Therefore, we felt that a

salpingectomy was a more appropriate surgical procedure for this case. Laparoscopic surgery, being less invasiveness, resulting in a smaller surgical scar, and for which we are very experienced, was chosen to be the most desirable approach.

In conclusion, we note that hydrosalpinx is a rare clinical entity in the pediatric age group, and that it is difficult to accurately diagnose preoperatively, even if suspected. Clinicians and surgeons should give special attention to the possibility of hydrosalpinx in adolescents having a history of inguinal hernia repair or other intrapelvic surgeries. As for retaining future reproductive capacity, before the operation begins, the patient should be carefully informed of the possibility of needing a unilateral salpingectomy and the resulting risk of some loss of reproductive potential.

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