

# An incidental diagnosis of a giant paraovarian cyst in a female teenager

## A case report

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### Abstract

**Rationale:** Paraovarian cysts (PCs) are cystic tumors that can be encountered between the ovarian hilum and the ovarian fimbria located within the mesosalpinx and broad ligament, being usually diagnosed within the 3rd and 4th decade of life.

**Patient concerns:** We report the case of a 15-year-old female admitted in our clinic for consciousness loss, who was incidentally diagnosed with a giant pelvic cystic at ultrasound.

**Diagnoses:** The magnetic resonance image showed a cystic mass of 170/140/85 mm, suggesting an origin from the left ovary, reaching the subhepatic area.

**Interventions and outcomes:** The surgical intervention revealed 3 PCs, a giant one and 2 smaller ones within the large ligament. The cysts were removed by laparoscopic approach, and the histologic examination did not reveal any signs of neoplasia.

**Lessons:** In addition to their rarity, giant PCs can be an incidental diagnosis in patients presenting unrelated symptoms resulting in increased difficulties related to the diagnosis. Moreover, the imagistic tools might not establish precisely the origin of these cysts, and therefore, the final diagnosis and treatment approach could be determined sometimes only during the surgical intervention.

**Abbreviations:** MRI = magnetic resonance imaging, OC = ovarian cyst, PC = paraovarian cyst.

**Keywords:** diagnosis, laparoscopic, ovarian cyst, teenager, ultrasound

## 1. Introduction

Paraovarian cysts (PCs) are cystic tumors that can be encountered between the ovarian hilum and the ovarian fimbria located within the mesosalpinx and broad ligament, being rarely diagnosed in teenagers.<sup>[1]</sup> These lesions are usually benign, accounting for 5% to 20% of all adnexal tumors, and they may originate from the Müllerian (paramesonephric) or Wolffian (mesonephric) ducts, or mesothelium.<sup>[1,2]</sup> It was reported that 68% of the PCs originate from the mesothelium that covers the peritoneum, being lined with flattened epithelium.<sup>[3]</sup> Nevertheless, 30% of them originate from the paramesonephric remnants, being lined with secretory, ciliated columnar, or cuboidal epithelium, while the

remaining 2% originate from the mesonephric remnants, and are characterized by cuboidal or flattened epithelium.<sup>[1,4]</sup> PCs are usually diagnosed during the 3rd or 4th decade of life, and up to 80% of them are asymptomatic being diagnosed incidentally during a random abdominal ultrasound.<sup>[5,6]</sup> Even though the occurrence rate of PCs is assumed to be lower in children than adults, the incidence of torsion rate of these lesions in children is reported to be relatively higher in comparison to adults. This fact may result from the increased pelvic ligaments in pediatric ages, especially the long infundibulopelvic ligament which allows the migration of adnexa into the pelvis leading to an increased propensity of the ovary to torsion.<sup>[1,7,8]</sup> Nevertheless, in certain cases these patients can present with abdominal pain, nausea, or vomiting due to cystic complications, such as perforation, bleeding, excessive growth, torsion, and malignant transformation.<sup>[5,6]</sup> The prevalence of neoplastic PCs is usually very low.<sup>[9]</sup>

Ultrasound and magnetic resonance imaging (MRI) are the most useful tools for the diagnosis of both ovarian and PCs. Abdominal ultrasound may show a cystic mass within the pelvis, usually an anechoic unilocular mass, but it may not show accurately the origin of these lesions. Moreover, it was reported that most often PCs are misdiagnosed as ovarian cysts (OCs), or other types of cystic pelvic masses, such as lymphoceles or peritoneal inclusion cysts.<sup>[10]</sup> Moreover, ultrasound is both examiner and patient dependent being more difficult in obese patients.<sup>[11–15]</sup> Therefore, genetically determined obesity should be diagnosed even since birth to prevent its potential long-term complications.<sup>[13,14,16–18]</sup> On the contrary, computed tomography or MRI proved to be more useful in differentiating these 2 entities by showing a clear delimitation between the normal affected-side ovary and the unilocular cystic lesion.<sup>[19]</sup> Despite all

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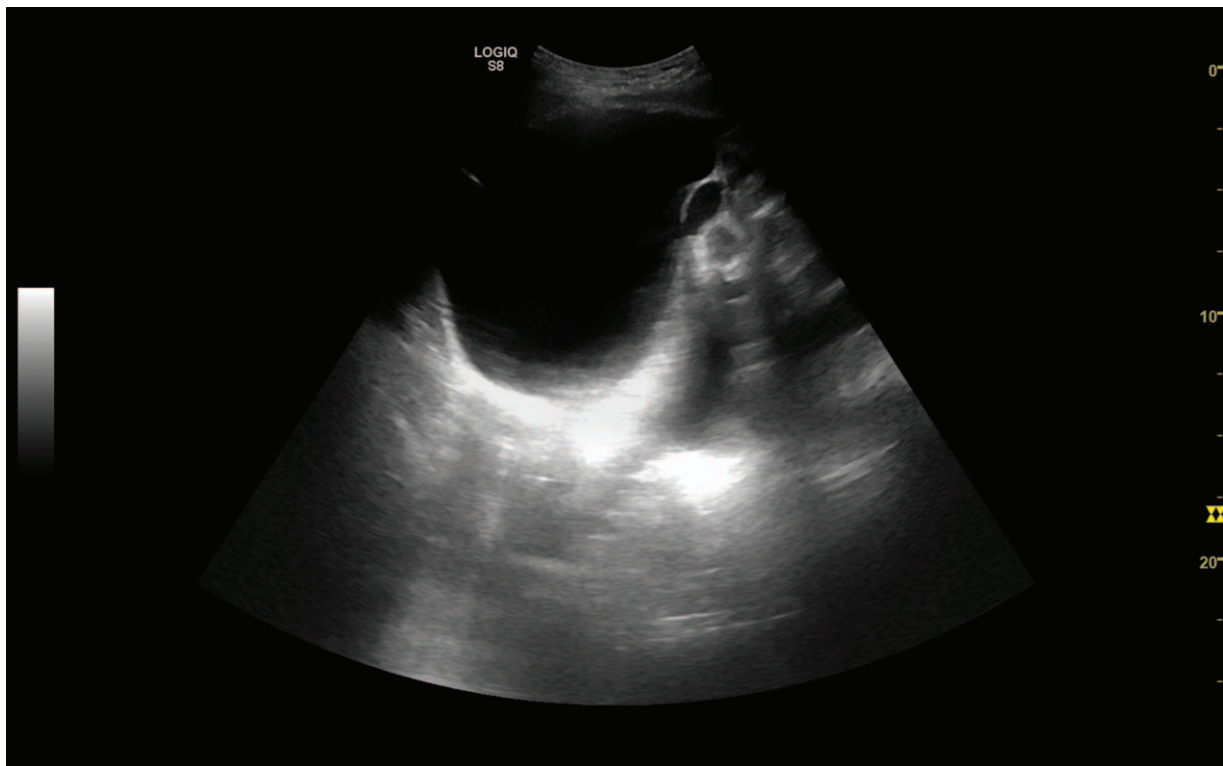
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**Figure 1.** Paraovarian cyst: abdominal ultrasound.

these facts, the preoperative differentiation between PCs and OCs remains very difficult to be established and most often the precise diagnosis is established during the surgery. Furthermore, this differentiation can be even more difficult for tumors that show atypical features. The most common ovarian lesions during adolescence and early adulthood are functional cysts, while the most common benign ovarian tumor in these groups is mature cystic teratoma.<sup>[20,21]</sup>

The management of pelvic cystic lesions must be based on the imagistic characteristics and the clinical appearance. Nevertheless, laparoscopy has become the gold standard regarding the surgical management for OCs and PCs in adults, with laparotomy being reserved for cases when malignancy is suspected.<sup>[22]</sup> Moreover, recent studies also advocated laparoscopic surgery as a conservative approach in teenagers and young females.<sup>[23,24]</sup> In young ages, this minimally invasive surgical approach is particularly important for future fertility. Therefore, the diagnosis and the therapeutic alternatives should be communicated with great skills to the parents to choose properly and to obtain the best short-term and long-term outcomes.<sup>[25]</sup>

The aim of this case report is to underline an incidental diagnosis of a giant PC misdiagnosed by MRI as originating from the left ovary.

Informed consent was obtained from the patient's mother (legal guardian) for the publication of this case report.

## 2. Case report

### 2.1. Presenting concerns

We report the case of a 15-year-old female teenager, admitted in our clinic for an episode of consciousness loss. Both family and personal history did not reveal any pathologic findings.

### 2.2. Clinical findings

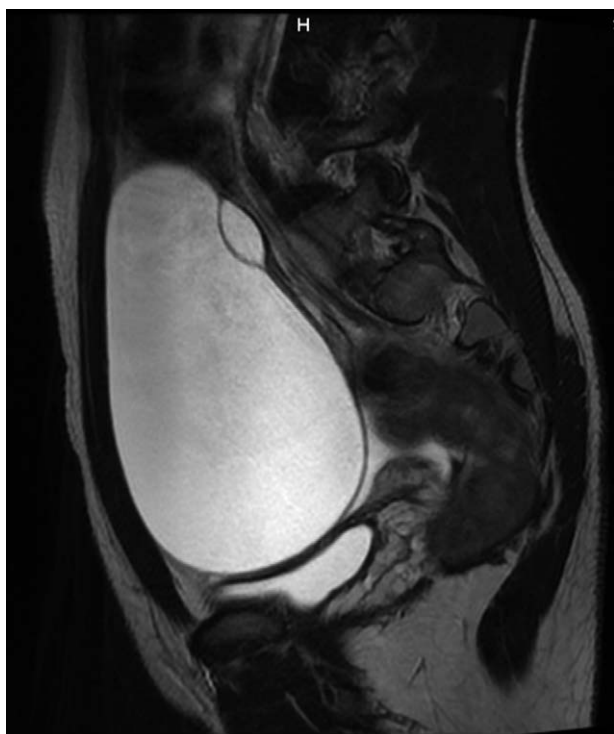
The clinical examination at the time of admission revealed mildly enlarged inferior abdomen and abdominal tenderness at palpation in the inferior quadrant of the abdomen. The patient weighed 49 kg.

### 2.3. Diagnostic focus and assessment

All the performed routine laboratory parameters were within normal ranges. The abdominal ultrasound revealed a pelvic anechoic homogeneous unilocular mass of approximately 175/109 mm diameter (Fig. 1). We performed an abdominal and pelvic MRI which revealed a giant cystic mass reaching the subhepatic area, with a craniocaudal/laterolateral/anteroposterior diameter of approximately 170/140/85 mm originating from the left ovary, well delineated from the surrounding structures and with enhancing fluid-type and homogeneous signal (Fig. 2). We also required a neurologic consult and an electroencephalogram for the episode of consciousness loss, without any pathologic findings. The cardiology consult was also normal. Therefore, we established the diagnosis of pelvic cystic tumors, most-likely OC.

### 2.4. Therapeutic focus and assessment

The patient was transferred to the Gynecology Clinic to benefit from the surgical management. Therefore, she underwent a laparoscopic intervention which revealed 3 cysts within the left broad ligament, establishing the diagnosis of left PCs. The surgical incision was performed between the round ligament and the tube, and by dissection the wall of the cysts was revealed. The cysts were drained obtaining a serous fluid, and then they were

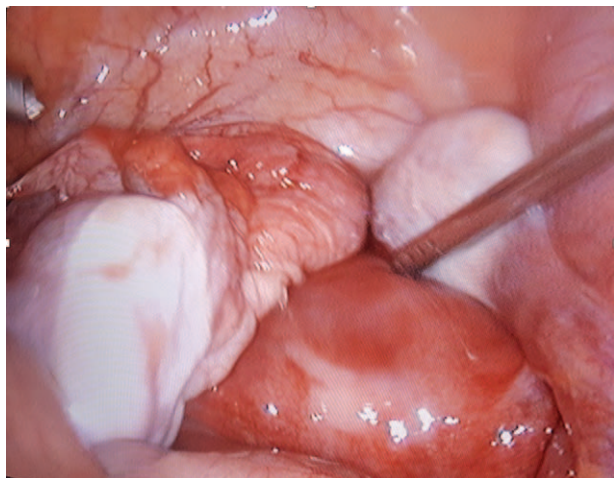


**Figure 2.** Paraovarian cyst: contrast enhanced magnetic resonance imaging.

surgically removed. The left ovary and tube were of normal macroscopic aspect (Figs. 3 and 4). The histologic examination revealed a giant unilocular paraovarian serous cyst, lined with a single stratified columnar epithelium without any signs of dysplasia, and 2 smaller unilocular simple PC (10/12 and 18/10 mm) both lined by a cuboid epithelium.

### 2.5. Follow-up and outcome

The patient's evolution was favorable, and she was discharged after 1 day. The follow-up at 1 month showed normal clinical, paraclinical, and ultrasound findings.



**Figure 3.** Paraovarian cyst: laparoscopic aspect.



**Figure 4.** Paraovarian cyst: intraoperator laparoscopic aspect.

### 3. Discussion

The PCs are usually encountered in the broad ligament between the ovary and the fallopian tube, and they may be either nonneoplastic simple cysts or neoplastic ones.<sup>[1]</sup> The histologic variants of PCs include mesonephric, mesothelial, and paramesonephric origins.<sup>[1,2]</sup> The most frequent reported type was paramesonephric variant.<sup>[26]</sup> In our case, the giant PC was also located within the broad ligament and the histologic examination revealed no signs of neoplasia. Even though retrospective studies showed a low incidence of neoplastic PCs,<sup>[1]</sup> a more recent prospective study showed a higher incidence of these lesions, of approximately 25%.<sup>[9]</sup> In these cases, the preoperative ultrasonography is the single tool that may suggest a neoplastic origin of these cysts revealing papillary projections or gross papillary excrescences on their internal wall.<sup>[9]</sup> Contrariwise, in our case, the abdominal ultrasound did not show any abnormal findings. Moreover, the sizes do not influence the neoplastic character of PCs. Usually these cysts grow slowly, and they are discovered incidentally during the third or fourth decade of life, being rare during childhood or adolescence.<sup>[5,6]</sup> Nevertheless, Torres and Íñiguez reported the case of a 13-year-old female presenting with intermittent abdominal pain and increase in abdominal volume who was diagnosed with a giant simple PC of 23/20/8.7 cm diameter.<sup>[27]</sup> Additionally, Felipe et al. reported a giant PC, but smaller than ours and that of Torres and Íñiguez, of 14 cm length in a 15-year-old patient, who also complained by abdominal pain and increase in abdominal volume.<sup>[28]</sup> Our patient was incidentally diagnosed with a pelvic cystic lesion because she did not express any symptoms, most likely due to the smaller sizes (170/140/85 mm) of the PC in comparison to the case previously mentioned. Another particularity worth mentioning is that in our patient, it was associated with another 2 smaller PCs. MRI is superior to ultrasound regarding the delineation between the ipsilateral ovary and the PC. Thus, a MRI usually shows a clear delineation between the pelvic cystic lesion and the normal shape of the affected-side ovary.<sup>[19]</sup> Moreover, according to the Society of Radiologists in Ultrasound, cysts larger than 7 cm require MRI assessment irrespective of the patient's age.<sup>[29]</sup> Nevertheless, in our case as in the case reported by Torres and Íñiguez,<sup>[27]</sup> the MRI misdiagnosed the cystic lesion as originating from the left ovary. Therefore, the preoperative diagnosis of PCs is very difficult to be certainly established despite proper imagistic assessments. Giant

PCs larger than 10cm are extremely rare even in adults, but especially in children, and anecdotal in the literature,<sup>[27,28,30–32]</sup> resulting in a supplementary burden on the diagnosis. Most of the times, these cystic lesions are asymptomatic, like in our case, but their complication rate seems to be higher in children than in adults, and the most frequent complication in pediatric ages is the torsion of adjacent organs such as Fallopian tube of ovary.<sup>[33]</sup> Thus, Gupta et al reported 2 cases of PC torsion in an 11-year-old and 9-year-old girls complaining of intermittent abdominal pain, strongly recommending laparoscopy to prevent potentially devastating complication, particularly in children.<sup>[34]</sup>

The management of PCs consists currently in laparoscopic approach.<sup>[23,24]</sup> Also, laparoscopy carries multiple other advantages besides its positive effect on preserving fertility, such as less blood loss, minimal tissue trauma, less perioperative discomfort, decreased hospitalization, and lower overall costs.<sup>[23,24]</sup> Our patient also benefited by a laparoscopic approach, and she was discharged after 1 day, presenting a favorable evolution and a very good outcome revealed also by the 1 month follow-up. The aspiration of the cystic fluid before removing the cyst is a method preferred by the majority of the surgeons.<sup>[9]</sup> In our case, the aspiration of the cystic fluid was also performed before removing the cyst completely, and a serous, clear fluid was obtained. In case of paraneoplastic cysts suspicion pre- or intraoperatively, the lesion should be removed through an endobag to prevent spillage of the fluid in the peritoneal cavity.<sup>[9]</sup>

Giant PCs are extremely uncommon during childhood. The preoperative diagnosis of PCs is very difficult despite the use of proper imagistic diagnostic tools. The surgical removal of PCs through laparoscopic approach is the gold standard treatment for children to prevent potentially devastating complication.

## Author contributions

Dr Mărginean Cristina Oana, Dr Mărginean Claudiu and Dr Meliț Lorena Elena conceptualized and designed the study, drafted the initial manuscript, and reviewed and revised the manuscript.

Dr. Mihai Poruțiu, Dr Vlăduț Ștefan Săsăran and Stud. Cristian Dan Mărginean designed the data collection instruments, collected data, carried out the initial analyses, and reviewed and revised the manuscript.

Dr Mărginean Claudiu and Dr Vlăduț Ștefan Săsăran were involved in the surgical management, designed the data collection instruments, coordinated and supervised data collection, and critically reviewed the manuscript.

All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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