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Large peritoneal inclusion cyst in pregnancy: A surgical challenge in multiple coeliotomies

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Abstract
Peritoneal inclusion cysts are uncommon, benign, multilocular abdomino-pelvic cysts seen in women of reproductive age arising after abdominal surgery or chronic inflammation. Occurrence of peritoneal cysts during pregnancy are very rare and often misdiagnosed as ovarian cyst due to similar clinical presentation and radiological findings. Small size asymptomatic cases can be observed but complete surgical excision is the definitive management for large cysts. We present a case of pregnant women with history of previous three laparotomies, complicated by a large peritoneal cyst which was excised at the time of caesarean section. We highlight the difficulties and challenges encountered during management of this case, emphasizing the need for a multidisciplinary approach in managing these lesions.

Keywords: Peritoneal inclusion cysts, inflammatory cysts, benign, reproductive age, pregnancy

Introduction
The incidence of adnexal masses during pregnancy is reported to be between 0.2% and 2%, and most of these are benign [1]. Although most cystic masses detected during pregnancy are of ovarian origin, there are rare non ovarian diagnoses that should be considered, especially when there is an atypical presentation on imaging. These diagnoses include omental cysts, mesenteric cysts, mucocele of the appendix, para ovarian cysts and peritoneal inclusion cysts [2]. Although most adnexal masses in pregnancy spontaneously resolve, intervention may be indicated for symptomatic patients or those at high risk of malignancy or torsion [3].
Peritoneal inclusion cysts (PICs) are also known as “peritoneal mesothelial cysts”, “peritoneal pseudocysts”, and “inflammatory cysts of the pelvic peritoneum” [4]. Peritoneal inclusion cysts develop in women of reproductive age, often following disruptions to the integrity of the peritoneum due to surgical interventions, trauma, inflammation, or endometriosis. These disruptions lead to a decreased ability of the peritoneum to absorb ovarian fluid, which is then trapped by postsurgical adhesions [5].
Peritoneal inclusion cysts during pregnancy are relatively uncommon, but they can occur and are often detected incidentally during routine ultrasound examinations. Various treatment options are offered to treat peritoneal inclusion cysts like observation, hormonal management, image-guided aspiration, image-guided sclerotherapy and surgical excision. Elective surgeries are usually the most common and definitive treatment [6].
Surgery in a previously multiple operated abdomen is a major challenge. The need for adhesiolysis results in increased operative time, a 6 to 10% incidence of inadvertent bowel injury, and a longer and more complicated convalescence. The risk for bowel injuries is amplified by each consecutive laparotomy and can be as high as 50% [7].
In this report we are presenting a case of large peritoneal cyst diagnosed during pregnancy which was surgically removed during caesarean section up in caesarean hysterectomy.

Case report
A 32-year-old pregnant women, G4P1A1E1L1, presented to us at 16 weeks of gestation for antenatal checkup. In her obstetric history she had one MTP at 18 weeks for fetal anomaly 4 years back. Her second pregnancy was left side ruptured tubal ectopic pregnancy for which she had undergone laparotomy and left salpingectomy 3.5 years back followed by one term caesarean section for fetal distress 2 years back. In present pregnancy she gave history of laparoscopy converted to laparotomy at 12 weeks of gestation for pain abdomen and multilocular cyst of size 16.9 cm x 13.3 cm x 6.3 cm in midline of pelvis and lower abdomen. Both ovaries could not be visualized separately (as per USG).

Cyst was partially excised as it was densely adherent to uterus, lateral pelvic wall and pouch of Douglas. Histopathology report confirmed it to be a peritoneal cyst. Her post-operative ultrasound after 2 weeks showed a residual cyst size of 4cm x3cm anterior to uterus.

On examination, she had a midline vertical scar of laparotomy from pubic symphysis to 5 cm above the umbilicus and her fundal height was around 24 weeks. Rest of the examination findings were within normal limit. She was subjected to ultrasound examination which revealed a complex cystic lesion of 11.5 cm x 5.2 cmx 11cm, with multiple thin septations, anterior to uterus, extending from mid line of pelvis to superiorly up to umbilical region. Both ovaries were not visualized separately. Her obstetric ultrasound was corresponding to her period of gestation with no obvious anomaly. MRI confirmed a large well defined cystic lesion in abdomen-pelvic area, measuring 12 × 6 cm x 11 cm, exhibiting T_2 hyper-intensity and T_1 hypo-intensity, with thin septa and no solid components, consistent with a peritoneal inclusion cyst. Her CA125, CEA and C19-9 levels were within normal limit.

She was followed up with monthly ultrasound which showed increase in size of the cyst. At 27 weeks of gestation cyst size was 18 cm x 10 cm x 12 cm, at 32 weeks gestation 19 cm x 12 cm x 12 cm and at 36 weeks it increased to 20 cm x 13 cm x 12 cm. Onco-surgeon opinion was taken, was advised follow up and excision during caesarean section. She was comfortable till 36 weeks, when she started dull aching pain over abdomen and breathlessness. Abdomen was over distended with cyst and fetus was present in transverse lie. Findings were confirmed by ultrasound. She was taken up for surgery after steroid coverage and consent, involving general surgeon.

Intra operative findings-lower part of uterus was densely adhered to anterior abdominal wall. Bladder could not be visualized. Two large multilobulated, thin-walled multicystic lesions containing serous fluid, around 15 cm x 12 cm noted distending both the broad ligaments, extending to pouch of Douglas. Attempted anterior dissection to approach lower segment but stopped due to bleeding. Transverse incision was given over uterus and delivered a live female baby of weight 2.5 Kg by breech with good Apgar. Placenta was delivered with all its membranes. Uterine incision sutured. Cysts were densely adhered to lateral pelvic wall, uterus and POD. Right side tube and ovary stretched over the cyst, left side ovary could not be visualized. Many cysts got ruptured during adhesiolysis and removal. Anterior dissection done exposing one separate thin-walled cyst of 8cm x 8cm between bladder and uterus, same was excised. All these dissections created raw area over uterus which was bleeding in spite of multiple hemostatic sutures and uterine artery ligation. Intraoperative decision for hysterectomy was taken and performed after consent to secure hemostasis. Two units of blood were transfused intraoperatively and two in post-operative period. Post-surgery recovery was uneventful. She was discharged on tenth day of surgery after suture removal. Histopathology of the cysts showed single layer of mesothelial cell lining suggestive of peritoneal cyst. Repeat ultrasound performed after one month shows no residual cyst.

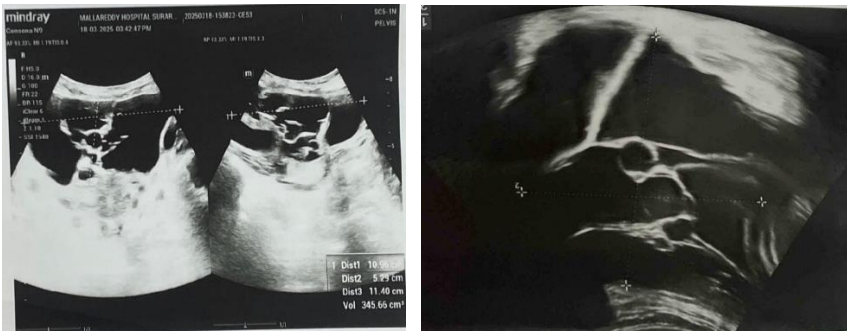
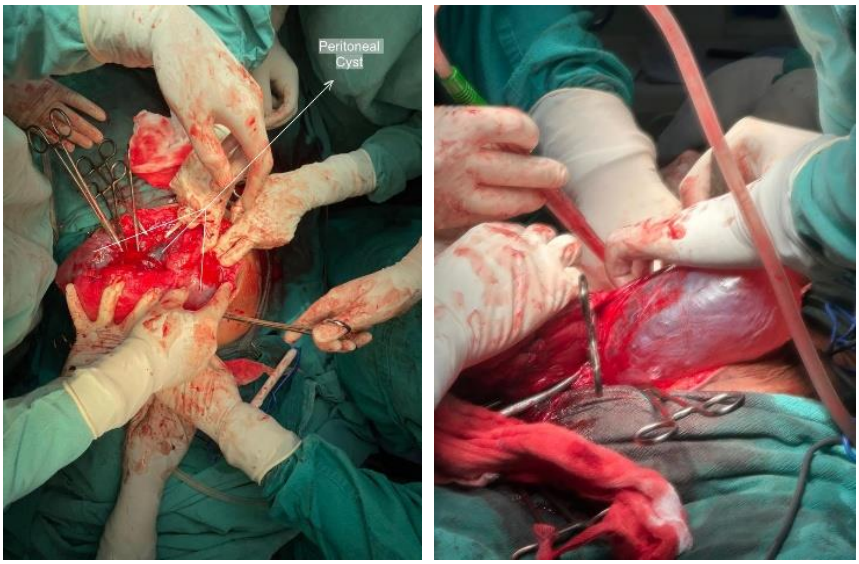


Fig 1: Ultrasound image of peritoneal cyst



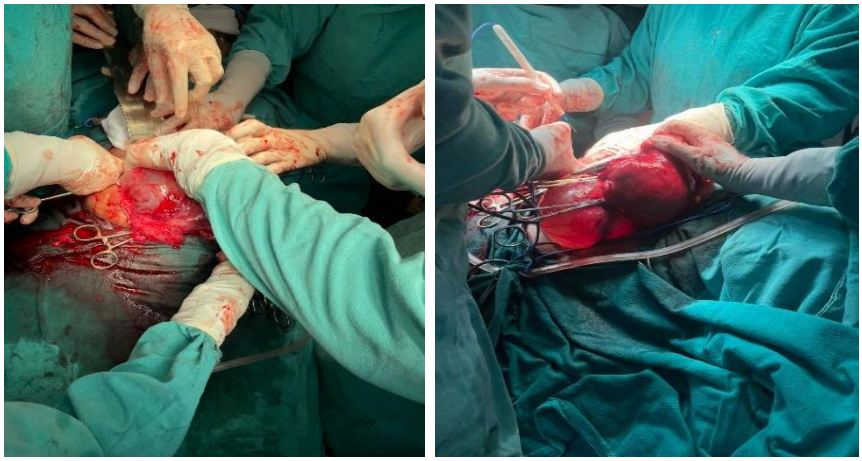


Fig 2: Intraoperative pictures of peritoneal cysts

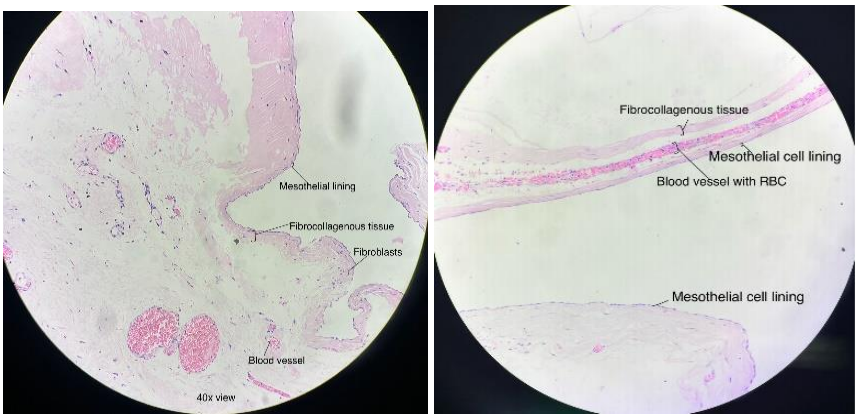


Fig 3: Microscopic picture of the peritoneal cyst

Discussion

Peritoneal inclusion cysts are uncommon mesothelium lined abdominopelvic cysts seen in reproductive age women. It presents as pelvic mass, may be misdiagnosed as an ovarian tumor. Postulated pathology for PIC includes inability to absorb physiological secretions of active ovaries by diseased, inflamed or fibrosed peritoneum forming cysts within peritoneal adhesions [8].

Risk factors for peritoneal inclusion cysts include previous intraperitoneal surgeries performed 6 months to 20 years earlier by any route, intraperitoneal inflammation, pelvic inflammatory disease, peritoneal tuberculosis, leiomyoma, tubo-ovarian abscess, etc. [9]. Our patient had previous 3 surgeries-laparotomy for ruptured ectopic, caesarean section and laparotomy at 12 weeks in present pregnancy.

Usual presentation of peritoneal inclusion cyst is progressive abdominal or pelvic pain or palpable mass. In our patient it was misdiagnosed as ovarian cyst in first trimester for which she was operated and diagnosed as peritoneal cyst by histopathology.

Ultrasound is the first-line imaging modality, effective in identifying peritoneal inclusion cysts, which typically present as a normal ovary surrounded by anechoic fluid that may contain multiple septations. In some cases, this fluid can become echogenic if haemorrhagic or proteinaceous material is present. MRI serves as a valuable second-line imaging technique in pregnancy, especially for more complex cases. It offers high soft-tissue resolution and multidimensional imaging capabilities, allowing for detailed characterization of pelvic masses [10].

Most cysts found in pregnancy do not require surgical resection, especially in the first trimester, unless they cause pain or result in torsion, obstruction or rupture [11]. Our case was operated in first trimester as she presented with pain abdomen with large multicystic lesion which confirmed the diagnosis of peritoneal inclusion cyst retrogradely. Cyst could not be removed completely as it was densely adherent to uterus and surrounding structures, attempt to complete the excision could have resulted in haemorrhage, injury, and miscarriage.

Various treatment options are offered to treat peritoneal inclusion cysts like observation, hormonal management, image-guided aspiration, image-guided sclerotherapy and surgical excision. Elective surgeries excising all the visible cysts are usually the most common and definitive treatment [6]. Risk of recurrence after extensive surgical resection has been reported to be 30-50% [4]. Overall, treatment strategies are individualized based on cyst size, symptom severity, and patient circumstances.

In our case due to rapid increase in the size, large lesion and previous incomplete excision, decision for complete resection was taken during caesarean section after seeking opinion from onco-surgeon and general surgeon. Our surgery was complicated due to extensive abdominal adhesions resulting from previous multiple surgeries. Cysts were in broad ligament and embedded between bladder and uterus, resection resulted in bleeding from the denuded area over uterus. Hemostasis could not be achieved by placing multiple hemostatic sutures and uterine artery ligation resulting in hysterectomy. Post-operative period was uneventful.

A similar case of peritoneal cyst in pregnancy was reported by Hitzerd E, *et al.* in 20124 in a primigravida with no history of previous surgery which was managed laparoscopically [1]. All cysts were drained, the visible cystic walls were partially removed, and multiple biopsies of the cystic wall were sent for histological analysis. There were no complications during the procedure, and the postoperative course was uneventful with

good fetal condition. The results of cytological and histological analysis confirmed it as peritoneal inclusion cyst.

Conclusion

Peritoneal inclusion cysts are rare during pregnancy but should be kept in differential diagnosis particularly when predisposing factors are present. Ultrasonography and MRI are the primary modality for diagnosis but definitive diagnosis is only after biopsy. Small size asymptomatic lesions can be managed conservatively but surgical excision is the mainstay of treatment. As these lesions occur in patients with previous abdominal surgeries, surgical difficulties, adhesions, risk of injuries, haemorrhage and increased morbidity should be anticipated.

Conflict of Interest

Not available

Financial Support

Not available

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