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Lithopedion (Stone Baby): A Review and Case Report

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Abstract: ***Lithopedion is the term given to dead calcified fetus which can remain unidentified for decades. It is a very rare phenomenon occurring in ectopic pregnancy. The immune system of the mother fails to absorbed the dead fetus if the fetus is large usually after a gestational age of 3 months which encases in calcium in order to protect the body from possible infections. Approximately 400 cases have been reported in the medical history so far. It remains asymptomatic therefore, mostly it is incidentally detected on investigating for other medical conditions. It is often detected in abdominal and pelvic CT scan, MRI scan, X - ray.***

Keywords: Lithopedion, Ectopic pregnancy, Stone baby, Calcified mass, Abdominal mass

1. Introduction

Lithopedion, also known as Stone Baby, is a term derived from the Greek words, "Lithos" meaning stone and "Paidion" meaning child. It is a rare medical condition where a deceased fetus resulting from ectopic pregnancy calcifies in the mother's abdomen preventing mother from infection due to the calcification of the remains of the deceased fetus arising from ectopic pregnancy, which was undiagnosed and untreated when the fetus cannot survive and the mother's body is unable to absorb, hence the immune system starts to calcify the fetus in order to protect against infections.[1]

Incidence

- It is very rare with occurrence in about 1.5 - 2% of extrauterine (ectopic) pregnancies.
- Age ranges from 30 to 100 years of age.
- Duration of time lithopedion is formed and retained in the body significantly ranges from 4 to 60 years.
- It remains asymptomatic in the mother's body for decades.
- Lithopedion cannot be developed unless the fetus survives for more than 3 months as the bones are cartilaginous causing absorption fast and complete.[2]
- Very few cases, approximately 400 only have been reported with first case in 1582.[3]

History of Lithopedion Cases

The first lithopedion case known was reported in 10th century described by Spanish Muslim physician Abū al - Qāsim (Abulcasis). The earliest known case of lithopedion was found in an archaeological excavation at Bering Sinkhole, on the Edwards Plateau in Kerr County, Texas in 1100 BC. Another early example was found in a Gallo - Roman archaeological site in Costebelle, Southern France, dating to the 4th century. By the mid - 18th century, a number of cases had been documented in humans, sheep and hares in France and Germany.3 However, the first case documented in the history of medical literature was in May 16th 1582 in the city of Sens, France, in autopsy conducted by surgeons, Claude le Noir and Iehan Couttas, of a woman named Madame Colombe Chatri, a 68 years old woman who were reported to carry the lithopedion for 28 years.[4]

In 1880, German physician Friedrich Küchenmeister reviewed 47 cases of lithopedion from the medical literature and distinguished three subgroups of lithopedion namely: Lithokelyphos, Lithotecnon/ Lithopedion and Lithokelyphopedion.[3]

2. Classification

According to German physician Friedrich Kuchenmeister:

- **Lithokelyphos** (Stone Sheath/egg shell): Calcification occurs on the placental membrane and not the fetus.
- **Lithotecnon/lithopedion** (Stone Child or true lithopedion): The fetus itself is calcified after entering the abdominal cavity, following the rupture of the placental and ovarian membranes
- **Lithokelyphopedion (**Stone Sheath and Child): Both fetus and membranes are calcified.3

According to D'Aunoy and King:

- **Skeletonization:** The bones of the foetus remain following the disintegration and absorption of the soft parts.
- **Adipocere:** The soft parts are replaced by fatty acids, soaps and salts of palmitic and stearic acids.
- **Suppuration:** The foetus is destroyed after an abscess has formed, usually due to E. coli infection.
- **True lithopaedion:** Fetus remains sterile and becomes infiltrated with calcium salts.

Pathophysiology

The dead fetus is too large to be reabsorbed by the immune system of the mother hence identifies as a foreign body. And in order to protect itself from possible infections arising from the deceased fetus, the mother's body encases the fetus in calcium turning it into a stone through a process called lithification. The fetus is gradually mummified to a stone baby. It may occur from 14 weeks of gestation to full term, and in this case, it is not unusual to remain asymptomatic that it remains undiagnosed for decades and found incidentally during imaging for other reasons.3

Factors Leading to Formation of Lithopedion

- Delayed Diagnosis
- Location of Implantation
- Maternal Age
- The fetus surviving beyond three months
- Sterility of the fetus

- The mother's immune system recognizing the fetus as a foreign body[1]

Symptoms

- Most cases of lithopedion remains asymptomatic for decades
- Pelvic pain
- Abdominal tenderness
- Chronic constipation
- Digestive problems[1, 3]

Diagnostic Evaluation

a) **Physical examination:** reveals infra umbilical mass

b) Imaging studies

- Magnetic Resonance Imaging scan
- Computed Tomography scan
- Abdominal radiograph
- Plain film of abdomen[5]
- Excretory urography
- Barium enema
- Ultrasound
- Abdominal X - ray

c) Laboratory tests

- Urine test: reveals elevated levels of mineral
- Blood test: stone formation may be revealed by the presence of certain minerals in the bloodstream
- Electrolyte levels

Complications

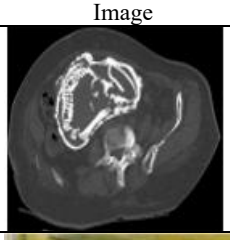
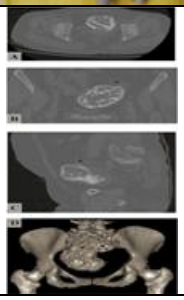
- Intestinal obstruction
- Pelvic abscess
- Cephalopelvic disproportion in future pregnancies
- Tubal infertility
- Fertility issue
- Post traumatic intestinal perforation
- Fistulisation of fetal parts in abdominal wall, rectum or vagina[1, 3]

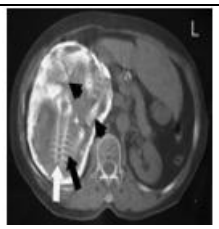
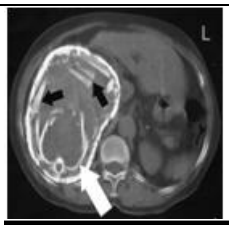
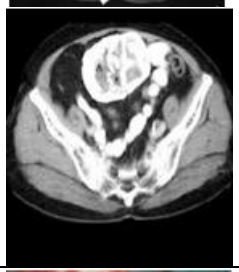
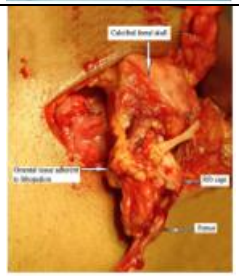
3. Treatment

Varies on factors such as size and position of the lithopedion, mother's health condition, and presence of any symptoms.

- **Observation**: In asymptomatic cases, the women is monitored with regular imaging
- **Surgery:** In symptomatic cases where patients complain of pain, discomfort, intestinal obstruction, etc., surgery may be required which again depends upon the size, location, and women's health condition.

Case Reports

S. No.	Age of patient	History/Complaints	Treatment	Image
1	80 years	Pain on right hip after a ground lever fall. Pelvis radiograph revealed right basicervical femoral neck fracture and incidentally showed a large abdominopelvic calcified mass. CT scan of abdomen and pelvis showed a mummified fetus with an estimated gestational age of 34 - 35 weeks.5	Left untreated as it was asymptomatic. However, a total right hip arthroplasty was performed for the fracture.	
2	85 years	History of cholecystitis, hospitalized with severe right upper quadrant pain. On physical examination, presence of a 21 weeks pelvic mass was found in lower abdomen. Lithopedion was found on the posterior of broad ligament with two femurs, skull, fingers, vertebra, and bony thorax. Two years after her fourth delivery, there was changes in her menstrual cycle as it was irregular and intermittent. Menopause occurred at 44 years of age which was 41 years before her admission. There were no serious complaints of abdominal discomfort.6	No report of treatment for lithopedion.	
3	52 years	She was referred to ER after an accident. On pelvic X - ray, a large mass - like ossification was observed. CT scan from abdominal and pelvic area revealed a calcified mass in the shape of fetus with flexion with presence of ribs, vertebra, and skull.2	Surgery was performed to calcified mass was removed.	
4	38 years	The patient was presented with pelvic abscess which was actually a 16 - week lithopedion resulting from abdominal pregnancy that was terminated 2 years earlier by a potassium chloride injection.7	Surgical removal of lithopedion followed by intravenous antibiotics.	

5	50 years	History of abdominal swelling for the past 15 years. The mass appeared after her last pregnancy which occurred 15 years ago. Neither antenatal care nor ultrasound was done to confirm the pregnancy. The patient thought she was conceived after 5 months of amenorrhea and the menstruation resumed at 7th month with no history of miscarriage or delivery of the gravis uterus and the abdomen size gradually decreased which again gradually enlarged over 15 years with associated discomfort and easy satiety (feeling of fulness after eating a small amount of meal). All of her deliveries were unsupervised. On examination, there was a firm mobile smooth and nontender pelvic mass (20 weeks size). The diagnosis made was uterine fibroid with a differential diagnosis of ovarian tumor. Ultrasound suggested calcified fetus.8	Extirpation (complete removal) of the calcified fetus and myomectomy.	
6	74 years	The patient (G_2P_1) had a CT scan for a palpable abdominal mass (with 35 years history) which was asymptomatic. In her first pregnancy which took place around 35 years ago, she experienced severe abdominal pain with loss of fetal movement at 9 months of gestation. No medical intervention was made due to poverty. Two years later after the incident, she was pregnant for the second time and delivered a fully term healthy male baby through vaginal delivery. The CT Scan revealed a calcified mass in the right abdomen with calcified fetal head, spine, ribs, and extremely long bones which was a confirmed diagnosis of a lithopedion.9	Surgery was suggested but the patient refused surgery and no complication was reported.	
7	63 years	The woman (G_2P_1) was presented with a palpable abdominal mass with 40 years history with signs and symptoms of lower abdominal discomfort and urinary frequency. Pelvic examination revealed uterus (postmenopausal) and a movable hard mass of fetal head size in the lower abdomen. Ultrasound suggested ovarian tumor which was big and densely calcified. Abdominal CT scan suggested highly calcified mass in the midline of the lower abdomen which was thought to be a tumor. On further questioning, she reported her previous obstetrical history of her pregnancy 40 years ago which continued for 9 - 10 months until she had vaginal bleeding with no signs of labor and no medical help was taken. Gradually her distended abdomen and feta movement disappeared and the palpable mass had developed. Two years later she became pregnant and gave birth to a daughter.[10]	After decalcification, the hard mass was suctioned and it was found to be a lithopedion.	 
8	50 years	The woman complaint intermittent dull aching pain in the right iliac fossa for 28 years associated with dyspepsia, occasional vomiting, pain, and abdominal distension since the past 7 days. She had 3 children. Ultrasonography revealed a calcified mass in the right iliac fossa. Laparotomy showed a calcified irregular mass entrapped in omentum present in right iliac fossa.[11]	Adhesiolysis with omentectomy which confirmed intra - abdominal lithopedion.	
9	20 years	Inability to conceive with regular menstrual cycles except for a single missed cycle which occurred 18 months back. The woman had no confirmed pregnancy as she did not visit a hospital. Her menses were resumed. She had occasional abdominal pain which was relieved by over - the - counter analgesics. Physical examination revealed a lump in right lumbar region. X - ray (abdomen and pelvis) showed foetal skeleton in right lumber region. Ultrasound confirmed calcified fetus of approximately 17 weeks of gestation.[12]	Laparotomy was done	

10	27 years	A woman (G_3P_2) was brought at King George Hospital in Visakhapatnam, Andhra Pradesh with chief complaints of severe abdominal pain. MRI scan revealed 24 weeks old calcified fetus in her abdomen.[13]	Surgically removed	

4. Conclusion

Lithopedion or stone baby, although very rare and asymptomatic should be identified and treated appropriately. Therefore, awareness regarding ectopic pregnancy and hospital visits on missed menstrual cycles must be encouraged.

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