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Intraperitoneal Haemorrhage with Couvelaire Uterus in a Case of Concealed Abruption with HELLP Syndrome

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Abstract **Case Report**

Couvelaire uterus, also known as utero-placental apoplexy, is a rare complication of abruptio placentae that can only be diagnosed via direct visualization of the uterus on laparotomy. In the current case study, we present a case of a 36-year-old female with Couvelaire uterus, in which with a high degree of suspicion for abruptio placentae and strict maternal-fetal monitoring, a good materno-fetal outcome (live, healthy neonate and stable mother) was achieved along with the avoidance of an unfavorable intervention like hysterectomy.

Keywords: Couvelaire uterus, Utero-placental apoplexy, case report, abruptio plantae, obstetric complication, matero-fetal monitoring, strict monitoring, vigilance**.**

INTRODUCTION

Couvelaire uterus was first described in 1912, by a French obstetrician named Dr. Alexandre Couvelaire. It is a very uncommon yet non-fatal condition that develops in severe forms of placental abruption (Couvelaire A, 1912).

It occurs when the decidual spiral artery ruptures, resulting in a haemorrhage which causes premature separation of the placenta and penetration of blood deeper to the decidua basalis. This further progress to seepage of blood into the myometrium as well as the parametrium. When this blood permeates underneath the serosa, it develops a bluish-purple discoloration or ecchymosis of the uterus. This bleed can travel further and extend into the peritoneal cavity resulting in hemoperitoneum, described first by Bertholdt in a case report in 2016 (Couvelaire A, 1912 and Bertholdt C *et al.*, 2016).

Several theories describing the aetiology of placental abruption have been proposed over time. A commonly anticipated mechanism blames poor placentation during early pregnancy, which causes characteristic under perfusion or ischaemia of both the uterus as well as the placenta seen in hypertensive disease in pregnancy and placental abruption (Naeye RL, 1989).

CASE REPORT

A 36-year-old un-booked unsupervised (gravida 4 para 2 live 2 abortion 1) with a period of gestation 31 weeks came to the casualty of the hospital with the chief complaints of pain abdomen and decreased fetal movements for 12 hours. The patient complained of mild vaginal bleeding for 12 hours.

The general condition of the patient was fair. Her vital signs were the following- heart rate: 90 beats per minute, peripheral capillary oxygen saturation (SpO2): 98% on room air, respiratory rate: 18 respirations per minute, temperature 37 degree Celsius, and blood pressure (BP): 184/110 mmHg. The patient was obese with a BMI of 30 kg/m2. Physical

examination revealed a 30-week irritable uterus with cephalic presentation. The fetal heart rate (FHR) was regular at 138 bpm, and the Cardiotocography (CTG) was reassuring at the time of the patient's admission. No active bleeding was visible per speculum examination. Per vaginal exam revealed a cervix that was 1.5cm dilated, soft, and mid-position; the presenting part was high up and the membranes were flat.

The laboratory investigations showed hemoglobin 8g%, TLC (total leucocyte count) 12,200 cells/cubic millimeter of blood, platelet count 90,000 per microliter. Liver function test revealed Aspartate Aminotransferase (AST) 128 IU/L, Alanine Aminotransferase (ALT) 147 IU/L, and Alkaline Phosphatase (ALP) 346 IU/L, total bilirubin 1mg/dl. Her blood urea nitrogen (BUN) was 26 mg/dL, serum creatinine 0.6 mg/dL, Random Blood Sugar (RBS) 93mg/dl, International Normalized Ratio (INR) 1.16, Prothrombin Time (PT) 16.2seconds, activated Partial Thromboplastin Time (aPTT) 114.4seconds and absent urine albumin.

On ultrasonography, there was a single live intrauterine fetus, cephalic in presentation, of an estimated fetal weight of 1.7 kg along with oligohydramnios. The placenta was anterior and there was no sign of placental separation or retroplacental clot seen.

BP control was done with IV Labetalol and an injection of Magnesium Sulphate was given for seizure prophylaxis. Inj Betamethasone was given for fetal lung maturity. Induction of labour was done with tab Misoprost 25 mcg. After 4 hours, CTG was non-reassuring and emergency LSCS (Lower Segment Caesarean Section) was performed under spinal anesthesia via Pfannenstiel incision.

Intraoperatively 500 ml of haemoperitoneum was seen in the abdominal cavity with bluish-purple discoloration of the uterus and base of the bladder. Minimal blood-stained liquor drained. About 1000 cc of retroplacental clots were evacuated. There was no PPH (Post-Partum Haemorrhage). Bilateral tubes and ovaries were normal. A liveborn male child was delivered weighing 1.6 kg with an APGAR score of 3 and 6 at 1 and 5 minutes, respectively. The baby was kept in NICU and discharged on the 7th day. Post-operatively, 2 units of PRBC (Packed Red Blood Cells) were transfused to the patient. Following that, the post-operative course of the patient in the hospital was uneventful and she was discharged on the 7th day.

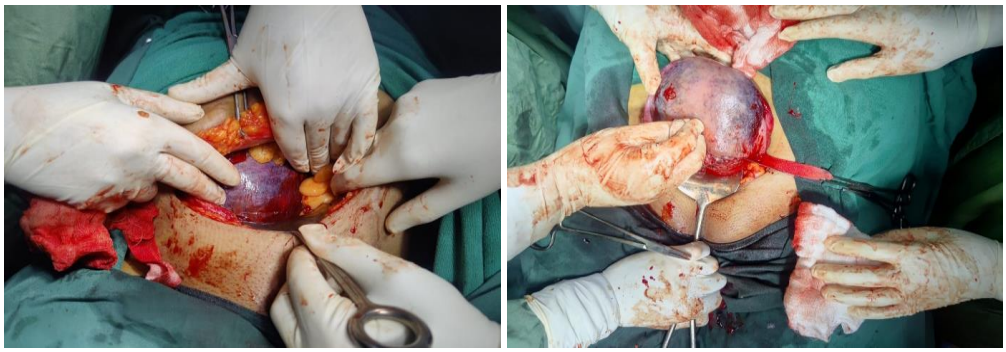

Figure 1 and 2: Images showing bluish-purple discoloration of the uterus, typical of Couvelaire uterus

Figure 3: Image showing haemorrhagic infiltration at the bladder base

DISCUSSION

Abruption placentae is the premature separation of a normally situated placenta after 20 weeks of gestation and before the birth of the baby, resulting in bleeding into decidua basalis. It is a major cause of maternal and perinatal mortality and morbidity. Couvelaire uterus is a complication of a severe form of placental abruption.

Placental abruption has an approximate overall incidence of 3 to 10 per 1000 births (Hubbard JL *et al.*, 1997). It is difficult to ascertain the exact incidence of the Couvelaire uterus as it can only be diagnosed on laparotomy. Hence, the reported incidence has been lesser than 5% of cases amongst the total placental abruption cases (Pauerstein CJ, 1979).

Though the primary etiology of placental Abruption is unknown, but several conditions that have been linked with it like placenta previa, amniotic fluid embolism, and pre-eclampsia. In our case, the risk factor was preeclampsia with HELLP syndrome. Its pathophysiology involves pathological damage to blood vessels within the placenta, following which blood penetrates into the decidua basalis leading to placental separation. The blood progresses into the uterine walls, particularly into the lateral parts of the uterus. At times, this haemorrhage extends beneath the serosa of the tubes, the broad ligament ligament connective tissue, into the substance of the ovaries, and into the peritoneum (Cunningham FG *et al.*, 1997). The uterus starts appearing purplish or copper-colored due to ecchymosis and often loses its contractile power (Pernoll ML, 1991).

Histologically, blood is seen between muscle layers, perivascular tissue, and the subserosa. Acute atheromatous processes with foamy macrophages are visible in the decidual spiral arterioles (Pauerstein CJ, 1979).

Abruptio placentae often presents with retroplacental clot (77.1%), followed by bleeding per vagina with uterine hypertonicity (27.8%) and vaginal bleeding with non reassuring fetal heart rate (16.1%) (Nath C *et al.*, 2006). However, all symptoms are usually not seen in all cases.

Diagnosis of abruption is clinical and radiological but diagnosis of Couvelaire uterus is only intraoperative by inspecting the uterus during LSCS. About 75% of cases of abruption get missed on ultrasonography as it has low sensitivity and high specificity (Gurung SD *et al.*, 2018). Therefore, it is essential that even in the absence of any finding of abruption on ultrasound, keeping a high index of suspicion is paramount.

Couvelaire uterus does not have any impact on the uterine ability to contract, thus permitting constriction of spiral arteries that helps to achieve hemostasis. Therefore, there have been several cases of Couvelaire uterus successfully managed conservatively (Mahendra G *et al.*, 2015 and Ming GS *et al.*, 2020). Unless, there is a delay in diagnosis which can result in an increased risk of Intrauterine Death (IUD), neonatal asphyxia, bleeding, and DIC, which then requires more stern intervention (Dashraath P *et al.*, 2020 and RCOG Guidelines no. 55, 2010).

Therefore, the management involves routine oxytocin and is mostly managed conservatively, as it does not cause post-partum haemorrhage (PPH) as believed earlier. It resolves usually spontaneously and a hysterectomy is usually not needed.

CONCLUSION

Couvelaire Uterus, though a rare complication, when associated with massive abruption can cause sudden deterioration of the patient. A keen eye to identify risk factors for placental abruption early on in pregnancy, properly managing hypertensive states, and avoiding trauma; coupled with regular antenatal visits can prevent it from happening. A high index of suspicion should be kept at all times coupled with strong vigilance instead of relying on ultrasonography findings only. When detected early, routine oxytocics can suffice and hysterectomy can be avoided. Therefore, with strict monitoring and timely intervention, a good materno-fetal outcome can be achieved in such high-risk patients.

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