Acute puerperal uterine inversion

Published on 03.01.2017

DOI: 10.1594/EURORAD/CASE.14233
ISSN: 1563-4086
Section: Genital (female) imaging
Area of Interest: Obstetrics (Pregnancy / birth / postnatal period)
Procedure: Diagnostic procedure
Imaging Technique: Ultrasound
Imaging Technique: Ultrasound-Colour Doppler
Special Focus: Obstetrics Case Type: Clinical Cases
Authors: Matos BA, Ozaki MA, Yamanari MGI, Neto MJF, Funari MBG.
Patient: 38 years, female

Clinical History:
A healthy 38-year-old woman, in spontaneous labor at 39 week's gestation, complicated with intense vaginal bleeding during umbilical cord traction and manual removal of the placenta, with prompt clinical observation of uterine inversion. Medical management, anesthesiology assistance and manual reduction were immediately performed with partial clinical improvement.

Imaging Findings:
Prompt post-treatment abdominal ultrasonography showed the "fallen fundus signs" [Fig. 1-4], characterized by "Y-shaped uterus" with a "crater-like depression" on its apical contour that continues as hypoechogenic stripes (serosa) downwards and centrally within an oval and circumscribed mass, which has myometrium-like texture and divides and lateralizes the endometrial cavity and displaces laterally the myometrium. The Doppler study demonstrated uterine vessels going deep into the "crater-like depression" and circulating the mass periphery [Fig. 2 and 4]. Residual partial uterine inversion was promptly diagnosed and Bakri balloon containing 400mL of physiological saline was immediately inserted into the uterine cavity. Eight hours later, the patient was evaluated with abdominal ultrasonography [Fig. 5-6] that showed rounded fundal contour of the uterus within Bakri balloon positioned in the inferior uterus, suggesting successful uterine reduction [Fig. 6]. Following that, the Bakri balloon was removed and normal early puerperal uterus was evidenced on transvaginal ultrasonography [Fig. 7].

Discussion:
Uterine inversion is the collapse of the uterine fundus into the uterine cavity. It is a rare and life-threatening maternal emergency, and most cases occur in low-risk women [2, 5]. Although many risk factors are described in the literature, the main ones are umbilical cord traction and manual removal of the placenta, as evidenced in the case reported [6]. Non-puerperal uterine inversion is extremely rare and related to uterine tumour [7]. The inverted uterine fundus can remain inside the uterine cavity, but may extend through the cervix, remaining within the vagina or extending outside the vagina. Both vagina and uterus inversion results in total inversion. Acute puerperal inversion occurs within 24 hours of delivering; subacute occurs within 24 hours to 30 days postpartum and chronic if more than 30 days [4].

Acute puerperal uterine inversion, as in the case reported, is an emergency condition and delayed diagnosis increases the morbidity and mortality, and can limit the treatment. The diagnosis is usually suspected clinically, and can be definitive when the inverted fundus is observed [3]. Lower abdominal pain and vaginal bleeding, and shock
eventually, are the typical manifestation.

Ultrasonography provides confirmation and evaluates complications and the treatment performed [6]. It can also promptly detect cases clinically not diagnosed. It is a non-invasive, low cost, fast and accurate imaging exam, considered the imaging modality of choice. The “fallen fundus signs” are the clue findings to make a definitive diagnosis. Rounded fundal contour excludes the uterine inversion [7]. Colour and spectral Doppler studies add diagnostic and prognostic information, identifying typical uterine vessels surrounding the lesion and signs of tissue viability with the presence of blood flow [1]. Higher resistance index flow than usual puerperal uterine artery pattern [9] indicates ischemia. No blood flow detected suggests severe ischemia. Magnetic resonance is helpful when ultrasonography is not conclusive [4].

Haemorrhage with shock is not uncommon and may be lethal in acute presentation, especially in severe inversion with late diagnosis. Uterine ischemia with rupture may occur. Prompt clinical management reverting the shock and relaxing the myometrium with manual intervention under general anesthesia are the main treatments performed [3, 8]. In addition, the Bakri balloon, a combination of principles of the manual manoeuvre and the hydrostatic pressure method can be used, as in the case reported [3]. If clinical treatment is unsuccessful or it is a late diagnosis, invasive reduction methods are necessary, including hysterectomy [7].

**Differential Diagnosis List:** Acute puerperal uterine inversion, Retained products of conception, Prolapse of submucous leiomyoma

**Final Diagnosis:** Acute puerperal uterine inversion

**References:**

Steven L, Rdulowski C, Gembruch U, Merz WM (2016) Color Doppler examination for the diagnosis of subacute puerperal uterina inversion. Arch Gynecol Obstet Published online 31 May (PMID:27245667)


Description: The "fallen uterine fundus signs": "Y-shaped uterus"; "crater-like depression" (white arrow); hypoechogenic stripes (yellow arrow); an oval and circumscribed mass (green arrow); uterine vessels (red arrow) Origin: Department of Radiology, Hospital Israelita Albert Einstein (São Paulo, Brazil)
Figure 2

Description: Doppler study confirmed the uterine vessels emerging from the "crater-like depression" and circulating the mass periphery (arrow). 

Origin: Department of Radiology, Hospital Israelita Albert Einstein (São Paulo, Brazil)
Description: “Y-shaped uterus” with uterine vessels going deep into "the crater-like depression" in the apical contour of the uterus and oriented downwards and towards peripherally the mass. **Origin:** Department of Radiology, Hospital Israelita Albert Einstein (São Paulo, Brazil)
Figure 4

*Description:* The "Y-shaped uterus" with the "crater-like depression" (arrow). *Origin:* Department of Radiology, Hospital Israelita Albert Einstein (São Paulo, Brazil)
**Description:** Rounded fundal contour of the uterus (arrow) after insertion of Bakri balloon. **Origin:** Department of Radiology, Hospital Israelita Albert Einstein (São Paulo, Brazil)
**Description:** Bakri balloon containing 400mL of physiological saline positioned in the inferior uterus.

**Origin:** Department of Radiology, Hospital Israelita Albert Einstein (São Paulo, Brazil)
Figure 7

Description: Bakri balloon removed with uterus showing usual puerperal morphology. Origin: Department of Radiology, Hospital Israelita Albert Einstein (São Paulo, Brazil)