Case 15871

Non-puerperal uterine inversion without underlying tumour
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Section: Genital (female) imaging
Area of Interest: Genital / Reproductive system female
Procedure: Diagnostic procedure
Technique: CT
Technique: MR
Special Focus: Acute
Case Type: Clinical Cases
Authors: Tonolini Massimo, MD.
Patient: 79 years, female

Clinical History:

Elderly G2P2 female patient without relevant medical history nor previous abdomino-pelvic surgeries, came to the emergency department because of muco-haemorrhagic vaginal discharge. Laboratory tests revealed moderately impaired renal function (estimated glomerular filtration rate 45 ml/min) and anaemia (10 g/dl haemoglobin).

Imaging Findings:

Emergency CT (Fig. 1) showed a solid, mass-like peripherally enhancing structure surrounded by air coursing through the dilated uterine cervix to reach the upper vagina, and loss of the normally convex uterine fundus was noted. Peritoneal effusion, adnexal abnormalities and adenopathies were absent. Retrospectively, the uterus showed normal shape and upper-normal limit size in a previous axial CT (Fig. 2) obtained 10 years earlier for unrelated reasons. Repeated gynaecological examination diagnosed occupation of the upper vagina by an inverted uterus, with signs of recent haemorrhage but no ongoing bleeding. Diagnosis was confirmed at MRI (Fig. 3) showing lost convexity and depression of the uterine fundus, and U-shaped inverted uterus with preserved zonal anatomy for age which extended downwards through the hypointense uterine cervix walls. Interestingly no signs of T2-hypointense leiomyomas or heterogeneously hyperintense tumours were visible. Laparotomic hystero-adnexectomy and surgical histopathology confirmed uterine inversion with atrophic endometrium, chronic cervical inflammation and normal adnexa.

Discussion:

Uterine inversion (UI) refers to fundus inside-out overturning and protrusion of the uterine fundus downwards up to or through the cervix, which presents in two very different situations. Relatively more common (0.03% of deliveries), puerperal UI is an acute life-threatening obstetric emergency which complicates mismanaged labour within 24 hours and causes severe pain and haemorrhage [1]. Conversely, the exceedingly rare (less than 200 reported cases) non-puerperal UI (NP-UI) develops insidiously in multiparous, postmenopausal women. NP-UI generally results from pulling effect of uterine masses, mostly (75-85%) submucosal or pedunculated leiomyomas attached to the fundus. Other involved factors include thinned
uterine walls, rapid growth, size and fundic location of the tumour which lead to distension of uterine cavity, dilatation of the cervix and expulsion of tumour [2-6]. In descending order of frequency, sporadic cases occurred secondary to prolapsed tumours such as uterine sarcomas, endometrial cancer [7] and endometrial polyps [8].

NP-UI manifests with pelvic tenderness or pain, vaginal discharge, irregular uterine bleeding, lower urinary tract symptoms. The vagina is generally occupied by a mass corresponding to the inverted uterus coming through the cervix. However, clinical diagnosis is challenging without a high index of suspicion, even if absent or depressed uterine fundus is palpated [2-6].

As a result, patients often undergo examination under anaesthesia and biopsy under suspicion of cervical cancer. Therefore, imaging is crucial for reaching a correct diagnosis, avoiding misinterpretation as cervical tumour and obviating biopsy which may potentially causes profuse bleeding. Albeit the uterus is not seen in its normal position, sonographically it is difficult to detect the true nature of the “mass” protruding into the vagina [2-6].

MRI generally clinches the diagnosis of UI: the hallmark appearance on sagittal viewing is an U-shaped uterus with indentation and depression of the fundus extending variably downwards, with a “bullseye” transverse configuration reflecting the zonal anatomy. Additionally, MRI may detect presence of T2-hypointense submucosal leiomyomas or heterogeneously hyperintense mass-forming tumours. Albeit with limited contrast resolution, as in this case lacking an underlying pulling mass, in acute settings contrast-enhanced CT with adequate image reformation may also allow recognition of UI [9, 10].

Treatment of UI should consider acute or chronic condition, fertility and reproductive wish of the patient, stage of inversion and underlying (benign or malignant) pathology. Whereas in acute UI manual repositioning is possible, NP-UI generally requires surgery with either abdominal (Haultain’s technique) or vaginal (Spinelli’s and Kustner’s) hysterectomy [11].

**Differential Diagnosis List:** Non-puerperal uterine inversion, Genital prolapse, Uterine inversion caused by leiomyoma, Cervical carcinoma, Endometrial carcinoma/sarcoma

**Final Diagnosis:** Non-puerperal uterine inversion

**References:**


**Description:** On preliminary noncontrast images, a solid round mass (*) surrounded by air was seen through the dilated uterine cervix (walls indicated by arrows) to reach the upper vagina. **Origin:**
Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
**Description:** Contrast-enhanced acquisition with sagittal (d) and coronal (e) reconstructions confirmed a peripherally enhancing structure (*), surrounded by air coursing through the dilated uterine cervix (walls indicated by arrows) to reach the upper vagina. **Origin:** Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
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**Description:** Multiplanar T2-(a...c) and T1-weighted (d) images showed depression of uterine fundus (thin arrows), U-shaped inverted uterus (*) with preserved zonal anatomy for age, extending downwards through the hypointense uterine cervix walls (arrows). **Origin:** Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
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Description: Post-gadolinium T1-weighted images (g,h) showed normal, strong and homogeneous enhancement of the inverted uterus (*) coursing through the uterine cervix (arrows) to the upper vagina. Note fundal depression (thin arrow). Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** Post-gadolinium T1-weighted images (g,h) showed normal, strong and homogeneous enhancement of the inverted uterus (*) coursing through the uterine cervix (arrows) to the upper vagina.

**Origin:** Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Obtained for reasons unrelated to the genital tract, axial CT had depicted normal shape and upper-normal limit size of the uterus (arrowhead). No peritoneal effusion and adnexal abnormalities.

Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)