Unicornuate uterus with non-communicating horn

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Outline

• Menu of tests
• Anatomy and embryology
• Our patient
• Companion patients
• Clinical importance
Menu of tests

- Ultrasound
- Sonohysterography
- Hysterosalpingography
- MRI
Ultrasound

• Indications: First line for imaging the female pelvis
• Preparation: Full bladder for abdominal; empty bladder for transvaginal
• Technique:
  - Transabdominal gives widest frame of view
  - Transvaginal is better to see detail
  - 3D ultrasound lets you see endometrium and myometrium in more detail
Sonohysterography

• **Indications:** Uterine polyps, submucosal fibroids, Asherman’s syndromes

• **Preparation:**
  - Done during proliferative phase of menstrual cycle (0-10 days after last menstrual period) to ensure the patient is not pregnant
    - Difficult to interpret during secretory phase because endometrium is thickened
    - Cannot be bleeding because there is a theoretical risk of causing endometriosis

• **Technique:**
  - Balloon catheter is placed in endocervical canal and used to inject saline
  - Transvaginal ultrasound is used to visualize the now distended endometrial canal
Hysterosalpingography

• Indications: Infertility evaluation, confirmation of tubal closure devices, visualize uterine anomalies

• Preparation:
  - Done between days 5-10 of menstrual cycle when flow has stopped to ensure no pregnancy and minimize risk of endometriosis

• Technique:
  - Catheter inserted in endocervical to inject contrast
  - Key radiographic images taken
    • Pre-injection
    • Early filling phase to see any filling defects that could be obscured by contrast
    • Later filling phase to see uterine cavity and fallopian tubes
MRI

• **Indications:** Visualization of gynecologic anatomy, surgical planning
• **Preparation:** None
• **Technique:**
  - Organ anatomy best visualized on T2 images
  - Hemorrhage or fat containing lesions best seen on T1 with fat saturation
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Anatomy

Embryology


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Mullerian duct anomalies

Three ways development can go wrong:
1. Mullerian ducts don’t develop
2. Mullerian ducts don’t fuse
3. Median septum doesn’t get resorbed
Types of anomalies

- unicornuate
- didelphys
- bicornuate
- septate
- arcuate
- DES

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Our patient

- 31 y/o female G2P1
  - Previous miscarriage
  - Required c-section at 37 weeks for 2\textsuperscript{nd} pregnancy because of intrauterine growth restriction
- Anatomic anomaly noticed during c-section
  - Appeared to be unicornuate uterus with possible second, atrophic horn
  - Follow up to further characterize her anatomy
- Follow up imaging: ultrasound, sonohysterogram and hysterosalpingogram
Companion patient 1: normal ultrasound

Cranial

Caudal

Endometrium

Sagittal transvaginal ultrasound

From: PACS
Our patient: ultrasound

The patient’s ultrasound looks very similar to the normal. Her anomaly was not picked up on previous ultrasound examinations. Further imaging showed her anomaly more clearly.
Our patient: sonohysterogram

The sonohysterogram more clearly shows one normal uterine horn and another horn with no endometrial cavity.
Companion patient 2: MRI

Our patient did not get an MRI. But here is what her condition would look like:

**Oblique coronal T2 MRI**

*Endometrium* *

Right horn is normal with myometrium and endometrium.

Left horn has no endometrium
Our patient: hysterosalpingogram

No left sided endometrial cavity or fallopian tube present

*Fallopian tube*

*Uterus*

From: PACS
Companion patient 3: hysterosalpingogram

Endometrial cavities and fallopian tubes present on right and left sides

Fallopian tubes

Uterus
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Companion patient 4: HSG

Didelphys

Incomplete fusion with two cervices and two endometrial cavities with no communication

Endometrial cavity

From: Deborah Levine, MD
Companion patient 5: HSG

Bicornuate

Incomplete fusion with one cervix and two endometrial cavities that are fused inferiorly but not superiorly

Endometrial cavity

Fused portion

Companion patient 6: HSG

Septate

Complete fusion but incomplete resorption of the median septum.

Endometrial cavity

Septum

From: Deborah Levine, MD
Companion patient 7: ultrasound

Septate

Complete fusion but incomplete resorption of the median septum.

Endometrial cavity

Septum

Transverse transvaginal ultrasound

From: Deborah Levine, MD
Companion patient 8: ultrasound

Septate

This patient is pregnant. It’s hard to tell if a uterus is bicorannuate or septate during gestation because the structures are not in usual proportions. However, you can tell that this patient has one of those anomalies.

Endometrial cavity

Septum

Transverse transvaginal ultrasound
Our patient: diagnosis

- **Final diagnosis:**
  Unicornuate uterus with patent right fallopian tube and non-communicating horn

- **Embryologic origin:**
  Agenesis of one Mullerian duct AND failure of ducts to fuse

Mullerian duct anomalies: clinical importance

• Can lead to increased risk of:
  - Unicornuate: abnormal fetal position, intrauterine growth retardation
  - Didelphys: range from asymptomatic to increased risk of spontaneous abortion
  - Bicornuate: spontaneous abortion, preterm birth
  - Septate: spontaneous abortion (due to abnormal vascularity in the septum)

• All types associated with ipsilateral renal agenesis
  - Our patient had normal kidneys bilaterally as seen on an outside exam
Review

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  • Ultrasound
  • Sonohysterogram
  • Hysterosalpingography
  • MRI

• Anatomy and embryology
  • Uterine anatomy
  • Uterine embryology
  • Types of Mullerian duct anomalies

• Our patient
  • Imaging

• Diagnosis
  • Unicornuate uterus with atrophic, non-communicating horn

• Companion patients
  • MRI
    • Unicornuate uterus
  • Hysterosalpingogram
    • Didelphys
    • Bicornuate
    • Septate
  • Ultrasound
    • Septate

• Clinical importance
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References