Republic of Iraq
Ministry of Higher Education
Al-Mustaqbal University
Radiology Techniques Department
Second Stage \ Special Radiological Procedures-1

Lecture No. (13)

Methods of Imaging in the Female & Male Reproductive system

&

Hysterosalpingography

By

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Methods of Imaging in the Female Reproductive system

1. Digital radiography (DR)

2. Hysterosalpingography (HSG)

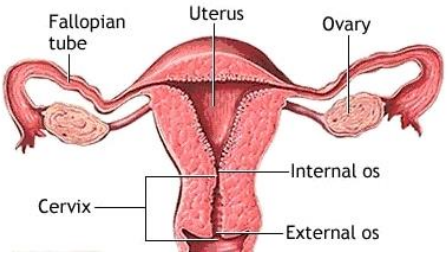
3. Ultrasonography (US)

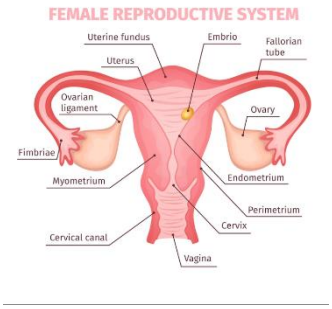
4. Computerized tomography (CT)

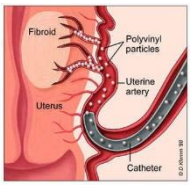
5. Magnetic resonance imaging (MRI)

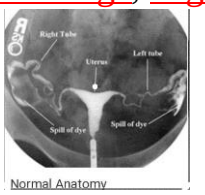
6. Minimally invasive procedures (MIP) including biopsies, cyst drainage, angiography, fibroid embolization

7. Positron Emission Tomography (PET)-CT









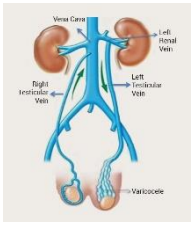
Methods of Imaging in the male Reproductive system (Scrotum and Testes)

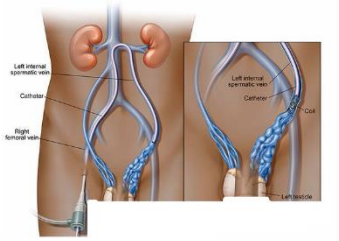
1. Ultrasound (US)

2. MRI

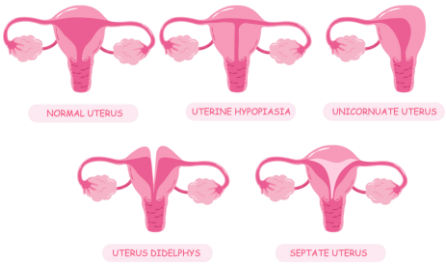
3. Radionuclide imaging

4. Venography (including embolization of varices) and angiography





Hysterosalpingography

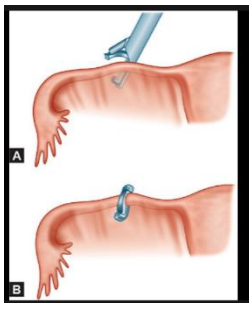


Indications

1. Infertility—**to assess** tubal patency

2. Recurrent miscarriages—investigation of **suspected** incompetent cervix, **suspected** congenital anomaly of uterus

3. Following tubal surgery to establish tubal patency, poststerilization to confirm obstruction and prior to reversal of sterilization



4. Assessment of the integrity of a caesarean uterine scar (rare)

Contraindications

1. During menstruation

2. Pregnancy or unprotected intercourse during the cycle

3. A purulent discharge on inspection of the vulva or cervix, or diagnosed pelvic inflammatory disease (PID) in the preceding 6 months

4. Contrast sensitivity (relative)

Contrast Medium

High osmolar iodinated contrast material (HOCM) or low osmolar iodinated contrast material (LOCM) 270/300 mg I mL−1 10–20 mL.

The contrast medium should be prewarmed to body temperature to avoid tubal spasm.

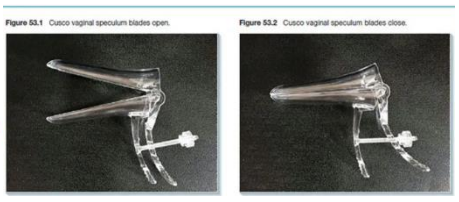
Equipment

1. Fluoroscopy unit with spot film device

2. Vaginal speculum

3. Vulsellum forceps

4. Hysterosalpingography balloon catheter 5-F to 7-F.



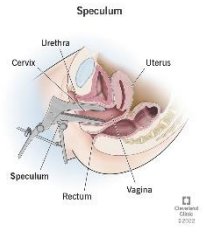
*In patients with **narrow cervix** or **stenosis of cervical os,** Margolin hysterosalphingography (HSG) cannula may be used. It has a **silicone tip** and provides tight occlusion of the cervix for contrast injection.

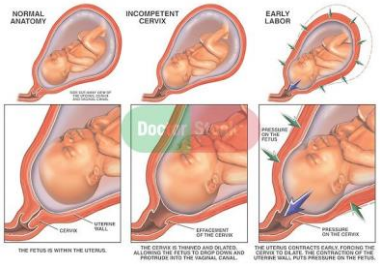
Patient Preparation

1. The appointment is made before day 21, or the examination can be booked between the 4th and 10th days in a patient with a **regular 28-day cycle.**

2. The patient should **abstain** from unprotected intercourse between booking the appointment and the time of the examination.

3. **Apprehensive** patients may need **premedication**. **Analgesics** before procedure may also help.



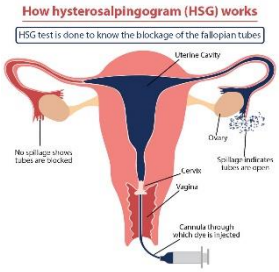


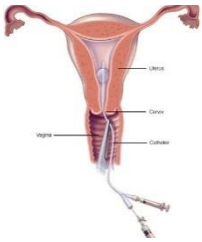
4. **Informed consent** should be obtained.

Technique

1. The patient lies supine on the table with knees flexed, legs abducted.

2. The vulva can be cleaned with **chlorhexidine or saline**.





A **disposable speculum** is then placed using sterile jelly, and the **cervix is exposed**.

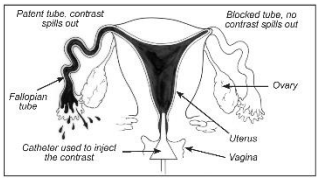
3. **The cervical os** is identified using a **bright light**, and the **HSG catheter is** inserted into the **cervical canal**. It is usually not necessary to use a **Vulsellum forceps** to hold the cervix with forceps, but occasionally this may be necessary.

*The catheter should be left within the **lower cervical canal** if cervical incompetence is suspected.

4. Care must be taken to expel all air bubbles from the syringe and cannula, as these would otherwise cause confusion in interpretation. **Contrast medium** is injected slowly into the uterine cavity under intermittent fluoroscopic observation.

5. Spasm of the uterine cornu may be relieved by intravenous (i.v.) Buscopan or glucagon if there is no tubal spill bilaterally. Prewarming the contrast medium to body temperature and injecting slowly may also help avoid tubal spasm.

Note: Opiates increase pain by stimulating smooth muscle contraction.

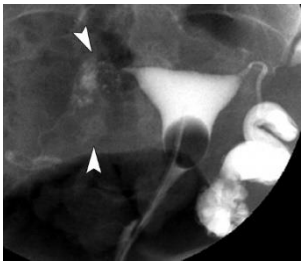


Images

The radiation dose should be kept as low as possible. Intermittent screening should be performed to the minimal requirement. Images should demonstrate the following:

1. Endometrial cavity, demonstrating or excluding congenital abnormalities or filling defects.

2. Full view of the tubes demonstrating spill. If occluded, show the extent and level of block.



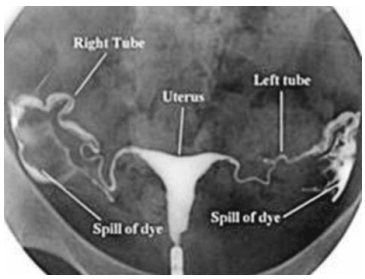
3. If there is abnormal loculation of contrast, a delayed view may be useful.

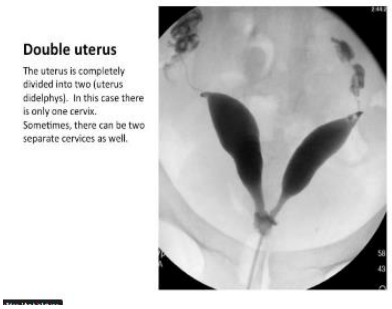
Aftercare

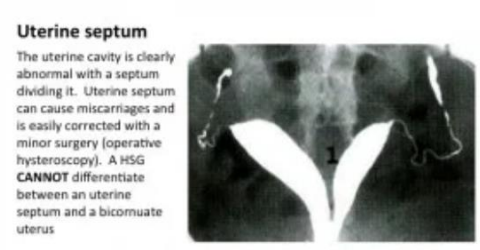
1. It must be ensured that the patient is in **no serious discomfort nor has significant bleeding before she leaves.**

2. The patient must be advised that she may have spotting or occasional **vaginal bleeding** for 1–2 days and **pain** which may persist for up to 2 weeks.

3. Prophylactic broad-spectrum antibiotics are routinely given in several centres and are good practice.







Complications

Due to the contrast medium

Allergic phenomena—**especially if contrast medium is forced into the circulation**.

Due to the technique

1. Pain may occur at the following times:

(a) When using the speculum

(b) **During** insertion of the cannula or inflation of balloon, some patients may have developed vasovagal syncope—'cervical shock'.

(c) Uterine or tubal distension proximal to a block or spasm

(d) With peritoneal irritation during the following day, and up to 2 weeks

2. Bleeding from trauma to the uterus or cervix

3. **Transient** nausea, vomiting and headache

4. Intravasation of contrast medium **into the venous system** of the uterus results in a fine lace-like pattern within the uterine wall. It is of **little significance** when **watersoluble contrast medium is used**.

***Intravasation** may be **precipitated by** direct trauma to the endometrium, timing of the procedure near to menstruation or curettage, tubal occlusion or congenital abnormalities.

5. Infection—which **may be delayed**. Occurs in up to 2% of patients and is more likely when there is a **previous history of pelvic infection.**

Q1. The male reproductive system can be imaged and evaluated by...

A. Digital radiography B. Hysterosalpingography C. Ultrasound

D. Plain radiograph E. All of the above

Q2. Which imaging technique is considered the most reliable and safe investigation for assessing tubal patency currently?

A. Transvaginal ultrasound scan B. Transabdominal ultrasound scan

C. MRI scan D. Hysterosalpingography with fluoroscopy

E. 3D endometrial imaging

Q3. What is the main purpose of using Buscopan or glucagon during hysterosalpingography?

A. To relieve spasm of the uterine cornu

B. To minimize radiation dose during the procedure

C. To prevent air bubbles in the syringe during contrast injection

D. To avoid tubal spasm by warming the contrast medium

E. To enhance collecting system distension

Q4. What is the medication that should be given to relax the muscles in the hystrosalpingography?

A. Maxalon B. Glucagon C. Buscopan D. Methyl cellulose E. None of the above

Q5. Which of the following equipments do not used in hysterosalpingography exam?

A. Fluoroscopy unit with spot film device B. Vulsellum forceps C. Biopsy needle D. Balloon catheter 5-F to 7-F E. Margolin cannula

Q6. What is a relative indication for hysterosalpingography?

A. Active infection with discharge B. Pregnancy C. Recent curettage.

D. Menstruation. E. Recurrent miscarriages

Q7. What is a potential complication related to the contrast medium used in hysterosalpingography?

A. Increased pain from smooth muscle contraction B. Tubal spasm

C. Allergic phenomena if contrast medium enters circulation

D. Significant bleeding after the procedure

E. Intravasation of contrast medium into the venous system

Q8 What is the main finding that indicates tubal obstruction in hysterosalpingography?

A. Fluid collection in endometrial cavity B. Tubal spill

C. Filling defects D. Loculation of contrast E. Level of tubal block

Q9. Which of the following is a type of iodinated contrast material used for hysterosalpingography?

A. HOCM B. LOCM C. Either HOCM or LOCM

D. Neither HOCM nor LOCM E. None of the above

Q10. One of the indications of hysterosalpingography is

A. To evaluate endometrial disorders B. To assess sperm motility

C. To diagnose ovarian cysts D. To assess tubal patency

E. To investigate polycystic ovarian syndrome

Q11- Which of the following is NOT a typical indication for hysterosalpingography (HSG)?

A. Infertility B. Recurrent miscarriages C. Postmenopausal bleeding

D. Assessment of tubal patency after surgery E. Investigation of suspected incompetent cervix

Q12-What is the most common contraindication for HSG?

A. Previous cesarean section B. Menstruation C. Obesity

D. History of pelvic surgery E. Allergy to iodine

Q13- Which imaging modality is most useful for assessing the patency of the fallopian tubes?

A. Ultrasound B. CT scan C. MRI D. HSG E. PET-CT