

Barium meal.

A barium meal is a diagnostic test used to detect abnormalities of the esophagus, stomach using X-ray imaging.

The images produced are fluoroscopic and can be viewed in real-time as well as on plates.

Methods

1. Double contrast. The method of choice to demonstrate mucosal pattern.
2. Single contrast. Uses include the following:
 - (a) Children—since it usually is not necessary to demonstrate mucosal pattern
 - (b) To demonstrate gross pathology only, typically very frail patients unable to swallow gas granules.

Indications

1. Failed upper gastrointestinal endoscopy or patient unwilling to undergo endoscopy
2. Gastro-oesophageal reflux disease where lifestyle changes and empirical therapies are ineffective
3. Partial obstruction.

Contraindications

Complete large-bowel obstruction.

Contrast Medium.

1. E-Z HD 250% w/v 135 mL
2. Carbex granules (double contrast technique).

Patient Preparation

1. Nil orally for 6 h prior to the examination
2. Assess contraindications to the pharmacological agents used.

Technique

The double contrast method

1. A gas-producing agent is swallowed.
2. The patient then drinks the barium while lying on the left side, supported by their elbow. This position prevents the barium from reaching the duodenum too quickly, thus obscuring the greater curve of the stomach.
3. The patient then lies supine and slightly on the right side, to bring the barium up against the gastro-oesophageal junction. This manoeuvre is screened to check for reflux, which may be revealed by asking the patient to cough or to swallow water while in this position (the 'water siphon' test). Extreme provocation testing with the patient in a head down position during swallowing is nonphysiological. Clinically relevant reflux is assessed by 24 h pH probe monitoring and by endoscopic evidence of oesophagitis. If reflux is observed, images are taken to record the level to which it ascends.
4. An i.v. injection of a smooth muscle relaxant (Buscopan 20 mg or glucagon 0.3 mg) may be given to better distend the stomach and to slow down the emptying of contrast into duodenum. The administration of Buscopan has been shown to not affect the detection of gastro-oesophageal reflux or hiatus hernia.
5. The patient is asked to roll onto the right side and then quickly over in a complete circle, to finish in an RAO position. This roll is performed to coat the gastric mucosa with barium. Good coating has been achieved if the areae gastricae in the antrum are visible.

Images (radiological view)

Comprehensive documentation of the examination is provided by the following:

1. Spot exposures of the stomach (lying):
 - (a) RAO—to demonstrate the antrum and greater curve

- (b) Supine—to demonstrate the antrum and body
- (c) LAO—to demonstrate the lesser curve en face
- (d) Left lateral tilted, head up 45 degrees—to demonstrate the fundus

From the left lateral position, the patient returns to a supine position and then rolls onto the left side and over into a prone position.

This sequence of movements is required to avoid barium flooding into the duodenal loop, which would occur if the patient were to roll onto the right side to achieve a prone position.

2. Spot image of the duodenal loop (lying):

- (a) Prone—The patient lies on a compression pad to prevent barium from flooding into the duodenum.

Aftercare

1. The patient must not drive until any blurring of vision produced by the Buscopan has resolved. This usually occurs within 30 minutes.
2. The patient should be warned that their bowel motions will be white for a few days after the examination and may be difficult to flush away.
3. The patient should be advised to eat and drink normally but with extra fluids to avoid barium impaction. Occasionally laxatives may also be required.

Complications

1. Leakage of barium from an unsuspected perforation
2. Aspiration
3. Conversion of a partial large bowel obstruction into a complete obstruction by the impaction of barium
4. Barium appendicitis, if barium impacts in the appendix (exceedingly rare)
5. Side effects of the pharmacological agents used.

