Capsule Endoscopy

H. Dutch Vanderveldt, MD, MBA
Assistant Professor of Clinical Medicine
Division of Gastroenterology
University of Miami
Objectives

- Understand Wireless Capsule Endoscopy (WCE) and its uses.
- Understand the contraindications to WCE and how to manage relative contraindications.
- Understand the possible complications of WCE.
- Understand what to do if retention or obstruction occurs.
I  Capsule Endoscopy
   A) Description
      1) What is it
   B) Small Bowel Capsule
      1) Indications
   C) Other types of Capsule Endoscopy
   D) Contraindications to Capsule

II  Complications of Capsule Endoscopy
   A) Managing the most common complications
      1) Retention
      2) Obstruction
Wireless capsule endoscopy is a non-invasive method for evaluating the mucosa of the digestive tract. It involves the ingestion of a small (11mm x 26mm) disposable single-use pill. The pill passes passively through the digestive tract via normal peristaltic motion. The capsule endoscope is excreted naturally with bowel movements and does not have to be recovered.
What is capsule endoscopy?

- The pill contains a camera (CMOS/CCD), a light source, battery, and antenna.
- The capsule does not store any data instead it transmits its captured images to a wearable receiver.
- The information from the receiver is later downloaded to a computer and viewed like a video.
What is capsule endoscopy?

- The most common type of capsule in use is the small bowel capsule.

Manufacturers:

- Capsule SB. Given Imaging Yoqneam, Israel
- Endo Capsule. Olympus Medical Systems Corporation Shinjuku-ku, Tokyo
- Korean MicroCam. Intromedic, Seoul, Korea
- OMOM Capsule Endoscope. ChongQing JinShan Science & Technology Co., Ltd Beijing China
Indications for the Small Bowel Capsule

- Obscure GI Bleeding
- Inflammatory Bowel Disease
- Inherited Polyposis Syndromes
- Suspected Small Bowel Tumors
- Celiac Disease
- May also be used selectively in the workup of abdominal pain, malabsorptive disorders, and diarrhea
Eso Capsule
- Made by Given Imaging
- Same size as the small bowel capsule
- Two cameras instead of one
- Indications:
  - Barrett’s screening in patients with chronic GERD
  - Screening for esophageal varices
Other Capsules

- **Agile Patency Capsule**
  - Made by Given Imaging
  - Same size as the small bowel capsule
  - Disolvable capsule with a rice kernal sized metal radio-opaque marker
  - Indications:
    - Prior to standard capsule endoscopy, used a tool to establish intestinal patency
Next Generation Capsules

- PillCam™ Colon Capsule Endoscopy (PCCE)
- Smart Capsules, such as...
The Vector Project:

- This capsule will be actively guided through the digestive system by either a doctor or computer.
- It is projected to have ultrasound capability and the ability to collect tissue samples.
Contraindications to Capsule

- Traditional contraindications to Wireless Capsule Endoscopy.
  - Swallowing disorders
  - Known or suspected gastrointestinal obstruction
  - History of gastroparesis, and significant intestinal surgery
  - History of large diverticula (Zenker’s), strictures, or fistulas
  - Implanted electromedical devices
  - Pregnancy and young children
Managing Contraindications

- Tools:
  - Endoscopic placement of capsule
  - A pre-evaluation with the Agile Patency Capsule
  - Higher level of monitoring (Pacer)
  - Thorough discussion of the risks
A recent study of 59 patients with known intestinal strictures and a negative Agile patency capsule study were given a standard wireless capsule endoscope to ingest. There were no cases of capsule retention.

Complications

- Include:
  - Retention with or without Obstruction
  - Aspiration
  - Capsule fracture

http://www.ajronline.org/cgi/content-nw/full/185/4/1048

FIG3
Complications: Retention

- The passage times for the capsule endoscope are variable. Usual range is between 24 and 222 hours.
- By consensus any asymptomatic patient who has not excreted an ingested capsule before 5 days is considered to have a “delayed” capsule passage.
- After 14 days the capsule is considered retained.

De Luca et al. 2003
Barkin, 2006
Complications: Retention

- Retained capsule is detected by abdominal x-ray.
- Management depends on the findings from the capsule and range from:
  - Watchful monitoring
  - Steroids
  - Endoscopic removal
  - Surgical removal
Complications: Obstruction

- A more serious complication
- Since the Wireless Capsule is non-disolvable, it can become irreversibly wedged areas of luminal narrowing.
Complications: Obstruction

- A patient with suspected obstruction from wireless capsule should be medically evaluated immediately.

- Symptoms:
  - Nausea and Vomiting
  - Significant Abdominal Pain
  - Abdominal Distension
Summary

- Wireless capsule endoscopy is a non-invasive method for evaluating the mucosa of the digestive tract.
- Although WCE is a relatively safe procedure there are contraindications to capsule endoscopy.
- Of the common complications regarding capsule endoscopy, obstruction requires urgent medical evaluation.
Bibliography

- Web Page: [http://www.ajronline.org/cgi/content-nw/full/185/4/1048FIG3](http://www.ajronline.org/cgi/content-nw/full/185/4/1048FIG3)