



California Pacific
Medical Center

A Sutter Health Affiliate
Community Based, Not For Profit

INTERVENTIONAL ENDOSCOPY SERVICE

At California Pacific Medical Center we are committed to bringing new and advanced diagnostic tools, medical treatments and surgical options to the physicians we serve and the patients they care for. Through this procedure profile, our physicians illustrate actual medical situations that provide you with a window into their practice of diagnosis, treatment and patient follow-up.

For patient referrals:
(888) 637-2762
www.cpmc.org/ies

Capsule Endoscopy

What is a capsule endoscopy?

A capsule endoscopy utilizes a wireless swallowable video camera to perform painless endoscopic imaging of the small intestine. The capsule is only 11 mm by 30 mm (about the length of a quarter), and packs a camera, light source, radio transmitter and battery. Capsule endoscopy is done on an outpatient basis. The patient simply swallows the capsule and the camera takes and transmits about two images per second as it travels through the gut. The patient wears a recording device approximately the size of a personal compact disc player around his or her waist and the video images are transmitted to aerials taped to the body and stored on the device. The patient is then free to continue with his or her regular daily routine. After eight hours have passed, the patient returns the recording device to the lab. Tens of thousands of images are then downloaded onto a computer for viewing by the endoscopist. Capsule endoscopy assists in diagnosing GI conditions such as bleeding, malabsorption and abdominal pain, and diseases such as tumors, Crohn's Disease, infectious enteritis, celiac sprue, and drug-induced ulceration.

How does the capsule move through the GI tract?

The capsule is ingested with a glass of water and then moves naturally through the gastrointestinal tract, as would any object or food, through peristalsis. The single use capsule is eliminated naturally and is not digested or absorbed into the body.

Does capsule endoscopy replace a diagnostic endoscopy?

Capsule endoscopy does NOT replace standard diagnostic endoscopy. The capsule endoscope provides a comprehensive examination of the small bowel, but does not visualize all parts of the esophagus, stomach and colon. Capsule endoscopy complements standard diagnostic



endoscopy and is generally performed after standard diagnostic endoscopy.

What are the risks of capsule endoscopy?

The capsule endoscope was developed by Given® Diagnostic Imaging System and was given FDA approval in August of 2001. The capsule is made of a specially sealed biocompatible material that is resistant to the digestive fluids throughout the GI tract. Patients have not reported any pain or discomfort from the capsule. The capsule can become impacted at a site of bowel obstruction or lumen narrowing and surgery may be required if the capsule does not spontaneously pass. Patients with a history of prior gastrointestinal surgery or bowel obstruction are at an increased risk of capsule impaction. In select cases, capsule endoscopy may be indicated for preoperative identification of a site of lumen narrowing. In addition, patients with implanted electrical devices (e.g., pacemaker) may experience electrical interference from the capsule endoscope, and patients are not permitted to undergo a Magnetic Resonance Imaging (MRI) scan until the capsule has been eliminated from the body.

What can patients expect?

The patient takes standard bowel prep for a colonoscopy the day before the examination ensuring the small bowel is clean. In the morning at the hospital, the recording device is
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case studies

1: Obscure Gastrointestinal Bleeding

Case Overview

A 74-year-old man presented with a history of recurrent melena and anemia requiring multiple blood transfusions over a six-month period. The patient was on coumadin therapy for a femoral artery bypass graft. Evaluation prior to his referral to California Pacific Medical Center included an upper endoscopy, colonoscopy and enteroscopy all failing to show a source of gastrointestinal bleeding. A nuclear medicine tagged red blood cell scan was also normal. He continued to bleed even after coumadin therapy was stopped and at the time of referral, the patient had received a total of 24 units of packed red cells over a six-month period. The patient was not on NSAID therapy.

Capsule Endoscopy Findings

Two actively oozing lesions suspected to be arterio-venous malformations (AVM) were seen during capsule endoscopy in the proximal jejunum within 10 cm of each other. Several non-bleeding AVMs were also seen.



Active bleeding from the proximal jejunum.



Non-bleeding arterio-venous malformation.

Treatment

The patient was referred for laparoscopic oversew of the bleeding lesions to California Pacific's Minimally Invasive Surgery Program.

Intraoperative enteroscopy was performed to localize the two bleeding sites. The bleeding lesions, both still actively oozing, were identified and oversewn. Remaining non-bleeding AVMs were also oversewn.

Outcome

Recovery from laparoscopic surgery was uneventful and the patient was discharged two days later. Melena resolved and the hemoglobin remained stable. No further blood transfusions have been required over three-month follow-up.

2: Chronic Abdominal Pain

Case Overview

A 43-year-old man who is status post colectomy for ulcerative colitis presented with chronic periumbilical abdominal pain of unknown etiology. The pain occurs at all times of the day as well as during sleep and peaks one to one and one-half hours after meals. An extensive abdominal diagnostic work-up, including CT scan of the abdomen and pelvis, abdominal MRI and upper GI series, did not show any abnormality.

Capsule Endoscopy Findings

Capsule endoscopy revealed multiple tiny aphthous lesions in the distal ileum measuring between 3 mm and 8 mm in diameter with a yellow exudative base and red margins. Patchy areas of denuded appearing mucosa with abnormal vessels were also noted. No active bleeding or strictures were found.



Tiny aphthous lesion in the ileum.

Treatment

Ileoscopy through the ileostoma confirmed the presence of small aphthous lesions. The patient was started on steroids and maintenance 5-aminosalicylic acid (5-ASA).

Outcome

He returned home on medication therapy for Crohn's Disease to be followed locally by his primary care physician.

3: Recurrent Gastrointestinal Bleed

Case Overview

A 71-year-old woman was admitted to her local hospital with melena, weakness, fatigue and mild shortness of breath. One year earlier she was diagnosed with iron-deficiency anemia with a hemoglobin of 5.7g and received three units of packed red cells. Past medical history was remarkable for type 2 diabetes mellitus, hypertension, peripheral vascular disease and atrial fibrillation, and she was on low dose aspirin. She underwent an extensive evaluation including an upper endoscopy, colonoscopy, mesenteric angiogram, and Meckel's study, all of which were normal. She continued to bleed and require blood transfusions and was transferred to California Pacific Medical Center.

Capsule Endoscopy Findings

Capsule endoscopy showed a single source of active bleeding in the proximal jejunum. There was a pulsatile cloud of bright red blood. No further lesions were seen.



Bright red blood rising from a site in the proximal jejunum.

Treatment

The patient underwent enteroscopy revealing a possible non-bleeding AVM. The area was injected with epinephrine, but the bleeding continued. After cardiology consultation she underwent laparoscopic surgery and a small section of proximal jejunum was removed. The bleeding lesion was consistent with a Dieulofof ulcer.

Outcome

Three days post surgery the patient was stable with a hematocrit of 30, returned to her regular diet increasing her nutritional intake. She continues to be followed by her primary gastroenterologist.

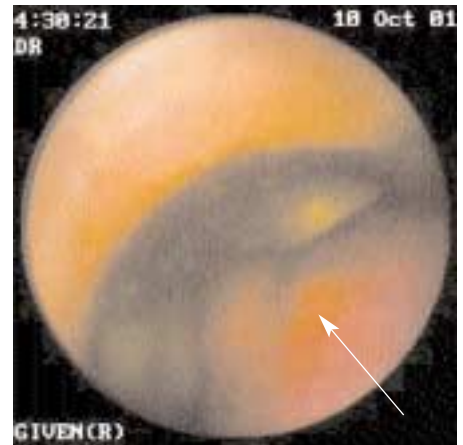
4: Small Bowel Neoplasm

Case Overview

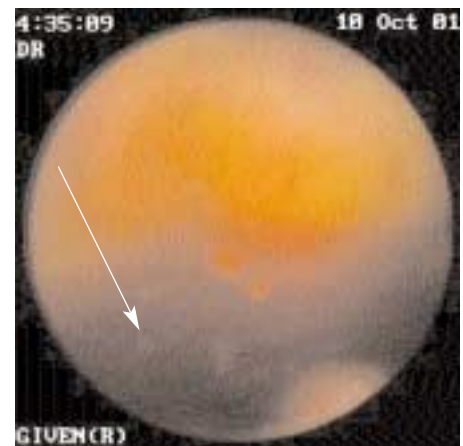
A 74-year-old male was referred to California Pacific Medical Center with a history of chronic occult gastrointestinal bleeding requiring multiple blood transfusions. Although he was on chronic iron replacement therapy, his hemoglobin level never normalized. He continued to experience black tarry stools with a drop in hemoglobin to 8.9g. Upper endoscopy revealed only mild reflux changes and small gastric polyps. His colonoscopy was normal; however, a tagged red blood cell scan suggested active bleeding involving the descending colon. A second colonoscopy was performed and did not show a bleeding source. A small bowel barium study was normal and an enteroscopy was performed revealing no abnormalities.

Capsule Endoscopy Findings

The capsule endoscope identified a lumen-occluding polypoid mass in the distal jejunum approximately 2 cm to 3 cm in size with active bleeding near the mass.



Large polypoid tumor in the mid-jejunum.



Bleeding adjacent to the polypoid tumor.

Treatment

The patient was referred to a local surgeon by his primary gastroenterologist.

Outcome

A mass, 3 cm in diameter, with an ulcerated surface was resected. Surgical pathology showed the mass to be a lipoma.

Capsule Endoscopy

WHAT CAN PATIENTS EXPECT? *continued from front page*

placed around the patient's waist and the sensor leads are attached. The patient swallows the capsule with a glass of plain water and can leave the hospital to pursue a regular daily schedule. Food and liquids are allowed two hours after ingestion of the capsule. Patients keep a timed diary for the day detailing the food and liquids ingested and symptoms during the recording period. Eight hours later the patient returns to the hospital where the recording device is removed. The capsule will usually be eliminated through a normal bowel movement within 24 hours of ingestion. Patients are asked to verify the elimination of the capsule, but NOT to retrieve the capsule. The capsule endoscope is a single use device that does not harbor any environmental hazards.

Indications for Capsule Endoscopy*

- **Obscure gastrointestinal bleeding**
- **Chronic abdominal pain**
- **Chronic diarrhea**
- **Malabsorption**

*after conventional endoscopic evaluation

Patient Referral to the Interventional Endoscopy Service

Patients need a referral from their primary care provider or physician specialist prior to scheduling their capsule endoscopy procedure. Medical records,



pertinent laboratory reports, and imaging reports need to be forwarded to California Pacific's Interventional Endoscopy Service to determine referral indication appropriateness. In select cases, patients may need to be seen in consultation prior to scheduling the capsule endoscopy procedure.

Insurance Coverage

Medicare currently requires preauthorization, however, is reviewing the procedure for future coverage. Medi-Cal coverage has not yet been determined. Some private insurance plans currently cover capsule endoscopy. In order to avoid unexpected medical expenses, it is always best for your patients to contact their insurance company prior to treatment to confirm coverage for this service and obtain prior authorization.

For more information

Please contact the Interventional Endoscopy Service or Dr. Kenneth Binmoeller.

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