



California Pacific  
Medical Center

A Sutter Health Affiliate

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# Endoscopic Mucosectomy

## 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.

### What is endoscopic mucosectomy?

Mucosectomy is a partial-thickness resection of the bowel wall. The resection plane is in the deep submucosa at the junction to the muscularis propria. Mucosectomy was originally developed for the purpose of obtaining a larger biopsy specimen, then called "strip biopsy," but evolved into a therapeutic procedure when it was discovered that this technique was capable of completely removing the mucosal layer. The technique is widely used in Japan for the curative treatment of superficial "early" cancers of the gastrointestinal tract. Unlike techniques that burn or destroy tissue, mucosectomy provides a tissue specimen for surgical pathology. The procedure is curative when two criteria are met: 1) the cancer is superficial, i.e., limited to the mucosal layer; and 2) the margins of resection are free of tumor.

### How does mucosectomy differ from polypectomy?

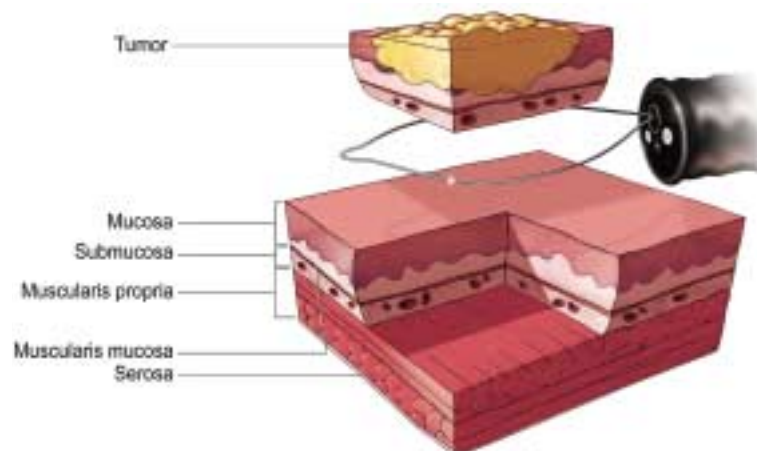
The resection plane of mucosectomy is deeper than that of polypectomy and the surface area to be resected is more extensive. Whereas polyps are readily captured and removed by the single application of a standard snare, cancerous or flat neoplastic growths require special accessories and techniques to achieve a deeper resection plane and a sufficiently wide area of resection.



Zoom endoscopy of high grade dysplasia showing aberrant crypts.

### How is mucosectomy performed?

Various accessories and techniques are used. Mucosectomy snares are made of stiffer wire and designed to grasp flat tissue. A deeper plane of resection is achieved by using endoscopic suction or saline injection to lift the lesion-bearing mucosa. Fitting a transparent cap on the tip of the endoscope can enhance the lifting power of suction. The cap has a rim to hold an open mucosectomy snare. Mucosectomy can also be assisted by band ligation of tissue (analogous to variceal ligation). Other accessories include a ceramic ball-tipped needle knife to carve out extensive flat growths. Piecemeal resection technique allows the resection of a broad surface area, ensuring complete removal of the lesion.



### Role of magnification endoscopy

Special magnification or "zoom" endoscopes enable the detection of subtle irregularities of the mucosa, such as aberrant pits, crypts, and vascular patterns that correlate with neoplastic transformation. The magnification

After mucosectomy the underlying muscularis propria is fully exposed.

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For patient referrals:  
(888) 637-2762

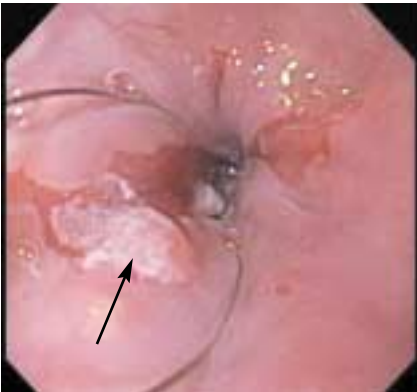
www.cpmc.org/ies

# case studies

## 1: Barrett's with focal carcinoma-in-situ

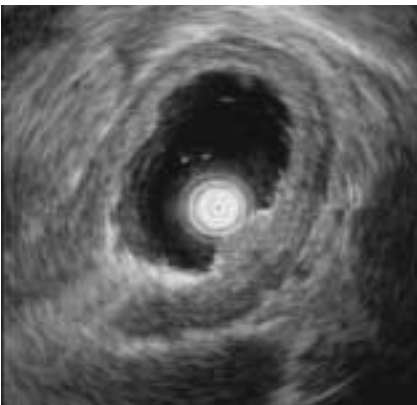
### Overview

A 78-year-old male ex-smoker with emphysema and a long-standing history of GERD was found on upper endoscopy to have Barrett's esophagus with a focal area of raised mucosa. A 1 cm nodular lesion was identified along a "tongue" of Barrett's mucosa.



Case 1. Nodular lesion along a "tongue" of Barrett's mucosa

Biopsies from the nodule showed carcinoma-in-situ, and biopsies from neighboring Barrett's mucosa showed intestinal metaplasia without dysplasia. The patient was referred to a surgeon for transhiatal esophagectomy. Due to the patient's high surgical risk endoscopic mucosal resection was recommended.



Case 1. EUS showing a nodular mucosal lesion with normal esophageal wall layers.

### Treatment

Endoscopic ultrasonography showed preservation of the esophageal wall layers along the length and circumference of the esophagus and focal thickening of

the mucosa in the area of the nodule. Mucosectomy was performed, removing a 5 x 3 cm strip of Barrett's mucosa containing the nodular lesion. Surgical pathology confirmed carcinoma-in-situ with tumor-free margins.

### Outcome

On surveillance endoscopy two months later the resected Barrett's was replaced by normal-appearing squamous epithelium. The remaining Barrett's mucosa was resected. Surgical pathology showed intestinal metaplasia without malignancy or dysplasia. The patient remains asymptomatic on PPI therapy and free of Barrett's at one-year follow-up.



Case 1. Post-mucosectomy

## 2: Barrett's with multifocal high-grade dysplasia

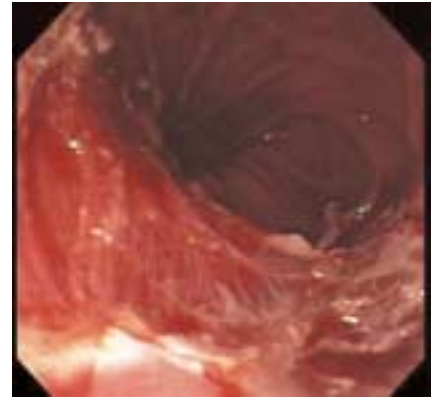
### Overview

A 63-year-old male with chronic GERD was diagnosed with circumferential Barrett's involving a 4 to 5 cm segment



Case 2. Circumferential Barrett's mucosa along the distal esophagus

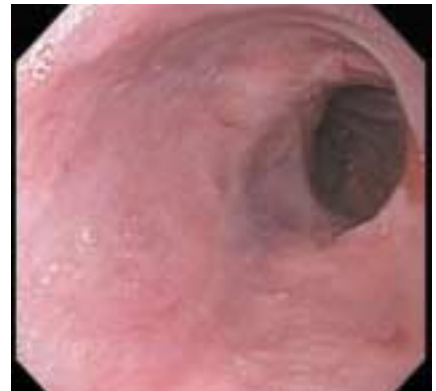
of the distal esophagus. Biopsies showed high-grade dysplasia, confirmed by a second pathologist. Biopsies obtained two years earlier showed intestinal metaplasia without dysplasia. He was referred to the Interventional Endoscopy Service for mucosectomy.



Case 2. Mucosectomy of the hemircumference of Barrett's with exposed muscularis propria

### Treatment

Enhanced magnification endoscopy showed typical Barrett's esophagus with patchy areas of aberrant mucosa consistent with high-grade dysplasia. EUS showed well-preserved wall layers and diffuse mucosal thickening. One-half of the circumference of the Barrett's esophagus was resected using piecemeal mucosectomy technique. Surgical pathology showed Barrett's metaplasia with foci of low and high-grade dysplasia



Case 2. Barrett's mucosa replaced by squamous epithelium after mucosectomy

# case studies

## Outcome

Follow-up endoscopy, six weeks later, showed the resected Barrett's mucosa was well healed, replaced by squamous epithelium. Mucosectomy of the remaining hemicircumference of his Barrett's esophagus was performed. Low and high-grade dysplasia was again found without malignancy.

## 3: Flat sessile adenoma

### Overview

An 83-year-old male with a history of iron deficiency anemia underwent upper endoscopy and was found to have a 3 cm sessile adenoma in the second portion of the duodenum extending over two folds.



Case 3. Large sessile adenoma in the duodenum

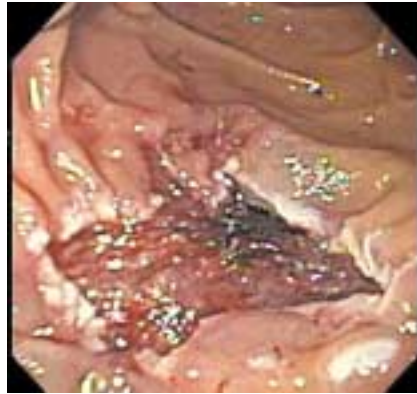
Biopsies showed tubular adenoma without dysplasia. He was referred to the Interventional Endoscopy Service for consideration of mucosectomy.

### Treatment

Saline was injected into the submucosa to raise the adenoma from the underlying muscle layer. Piecemeal resection was performed using a monofilament mucosectomy snare. The resection margins were fulgurated with argon plasma coagulation.

## Outcome

Follow-up endoscopy with biopsies six months later showed scarring with no residual or recurrent adenoma.



Case 3. Post-mucosectomy

## 4: Large colon adenoma

### Overview

A 54-year old female who underwent screening colonoscopy was found to have a 5 cm adenomatous growth encompassing the hemicircumference of the sigmoid colon. Biopsies showed a tubular-villous adenoma. She was referred for mucosectomy.



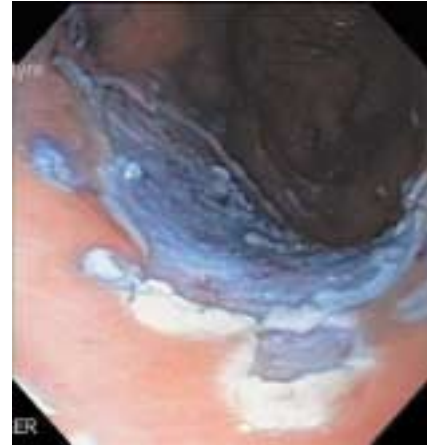
Case 4. Large adenoma in the sigmoid colon (without chromoscopy)



Case 4. Chromoscopy with indigocarmine

## Treatment

Endoscopic ultrasonography showed thickening of the mucosa with preservation of the submucosa and muscularis propria layers. Saline-assisted piecemeal mucosectomy was performed without complication.



Case 4. Post-mucosectomy

### Outcome

Surveillance sigmoidoscopy three months later showed scarring at the site of previous mucosectomy with no residual or recurrent adenoma.



Case 4. Scarring at site of previous mucosectomy

# Endoscopic Mucosectomy

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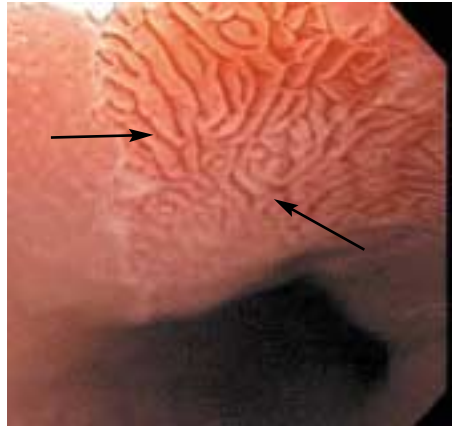
effect is enhanced by spraying dyes or acetic acid onto the mucosal surface, thus “enhanced magnification.” Zoom endoscopy is performed prior to mucosectomy to define the precise extent of neoplastic involvement. In patients with Barrett’s esophagus, zoom endoscopy facilitates the detection of high-grade dysplasia and carcinoma. The orderly villiform appearance, characteristic of Barrett’s esophagus, is replaced by featureless mucosa with aberrant crypts. These sites are then targeted for biopsy confirmation of cancerous transformation.

## Role of endoscopic ultrasonography (EUS)

EUS is performed prior to mucosectomy to select those patients who are suitable candidates for endoscopic treatment. EUS defines the infiltration depth of neoplasia relative to the wall layers and interrogates surrounding tissue for metastatic spread. Both standard echoendoscopes and high-frequency ultrasonic catheter probes are used.

## Mucosectomy for Barrett’s esophagus

Treatment of Barrett’s esophagus is indicated when biopsies show high-grade dysplasia or carcinoma-in-situ. Local endoscopic treatment by mucosectomy may be curative when cancerous change is intramucosal. A raised or nodular area suggests focal cancerous change (*see Case Study 1*). Widespread mucosectomy of Barrett’s esophagus is performed when cancerous transformation is diffused (*see Case Study 2*). When Barrett’s esophagus is circumferential, resection is



*Zoom endoscopy of a “tongue of Barrett’s mucosa showing cerebriform villous architecture.*

performed piecemeal over two or more sessions to avoid post-resection stricturing. The stripped Barrett’s mucosa re-epithelializes with normal squamous epithelium.

## Mucosectomy for large sessile adenomas

Large sessile adenomas require mucosectomy for removal. Chromoscopy, with indigocarmine or methylene blue, aids in defining the extent of such growths, which may be carpet-like. When very flat, fluid is injected into the submucosa to raise the lesion from the underlying muscularis propria to enable ensnarement and provide a safety “cushion” to prevent perforation. Before injection, the perimeter of the growth is marked with diathermy using the tip of a snare. After mucosectomy, the resection site is tattooed with India ink to enable easy recognition on surveillance endoscopy.

## Patient referral to the Interventional Endoscopy Service

Patients need a referral from their primary care provider or physician specialist prior to scheduling endoscopic mucosectomy evaluation and 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.

## Insurance Coverage

Medicare, Medi-Cal and most private insurance plans, covers endoscopic mucosectomy. In order to avoid unexpected medical expenses, it is always best for 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 at (415) 600-1551 or e-mail

**Kenneth F. Binmoeller, M.D.**  
*Medical Director*  
*Interventional Endoscopy Service*

Email: [binmoek@sutterhealth.org](mailto:binmoek@sutterhealth.org)

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