

Fundic gland polyps

Morphology, pathogenesis, syndromic associations and clinicopathologic interpretation

Gastric pathology

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Learning objectives

- Localize fundic gland polyps within gastric oxyntic mucosa.
- Explain sporadic, proton pump inhibitor–associated and inherited settings.
- Recognize the defining microscopic composition and limited inflammation.
- Contrast fundic gland polyps with hyperplastic polyps and adenomas.
- Interpret dysplasia risk according to the clinical context.

Gastric polyps are a heterogeneous finding

- A gastric polyp projects above adjacent mucosa; This describes a growth pattern, not a single diagnosis.
- Polyps, nodules or masses in up to 5% of upper gastrointestinal endoscopies.
- Histologic type—not polypoid appearance alone—establishes the relevant biological interpretation.

Interpretation

A raised mucosal lesion may reflect epithelial growth, inflammation, ectopia or neoplasia.

Mechanisms behind a raised gastric lesion

**Epithelial / stromal
hyperplasia**

**Inflammation or
repair**

Ectopic tissue

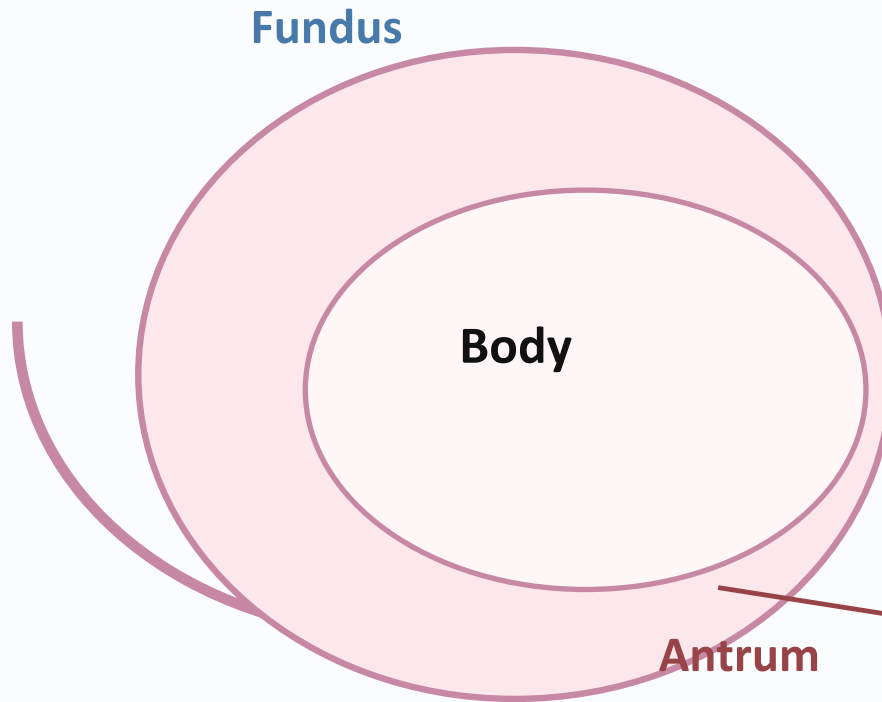
Neoplastic growth

Alternative mechanisms — not successive stages of the same process.

Three epithelial polyp patterns to separate

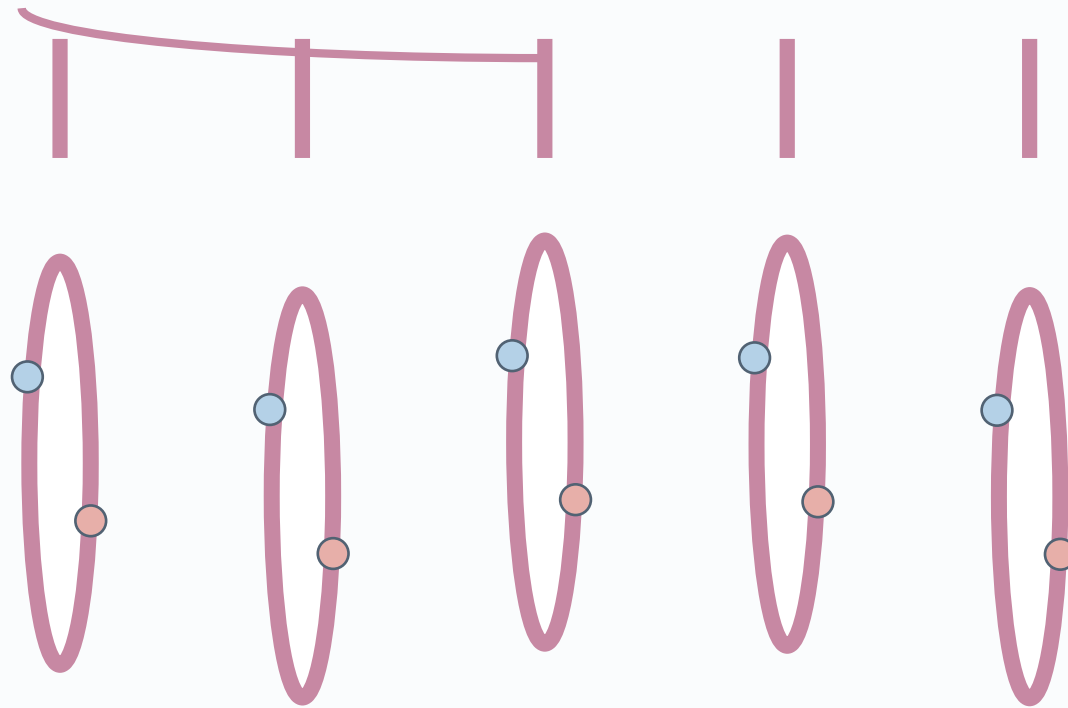
Pattern	Decisive histologic clue
Fundic gland polyp	Cystically dilated oxyntic glands
Hyperplastic / inflammatory polyp	Elongated, irregular foveolar glands with edema / inflammation
Gastric adenoma	Dysplastic glandular epithelium

Regional gastric anatomy determines the gland type



- Fundus and body contain well-developed oxyntic glands.
- Antrum is a major source of gastrin-producing G cells.
- Fundic gland polyps occur in the body and fundus.

The body and fundus contain oxyntic glands

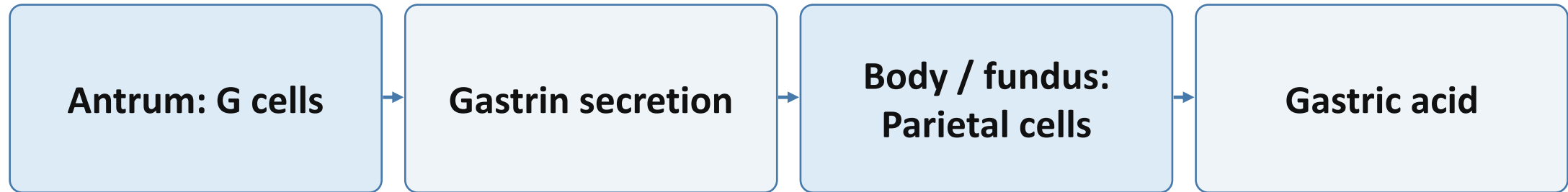


- Parietal cells produce gastric acid.
- Chief cells produce and secrete digestive enzymes.
- This normal glandular repertoire is retained in fundic gland polyps.

Gastric epithelial lineages have different roles

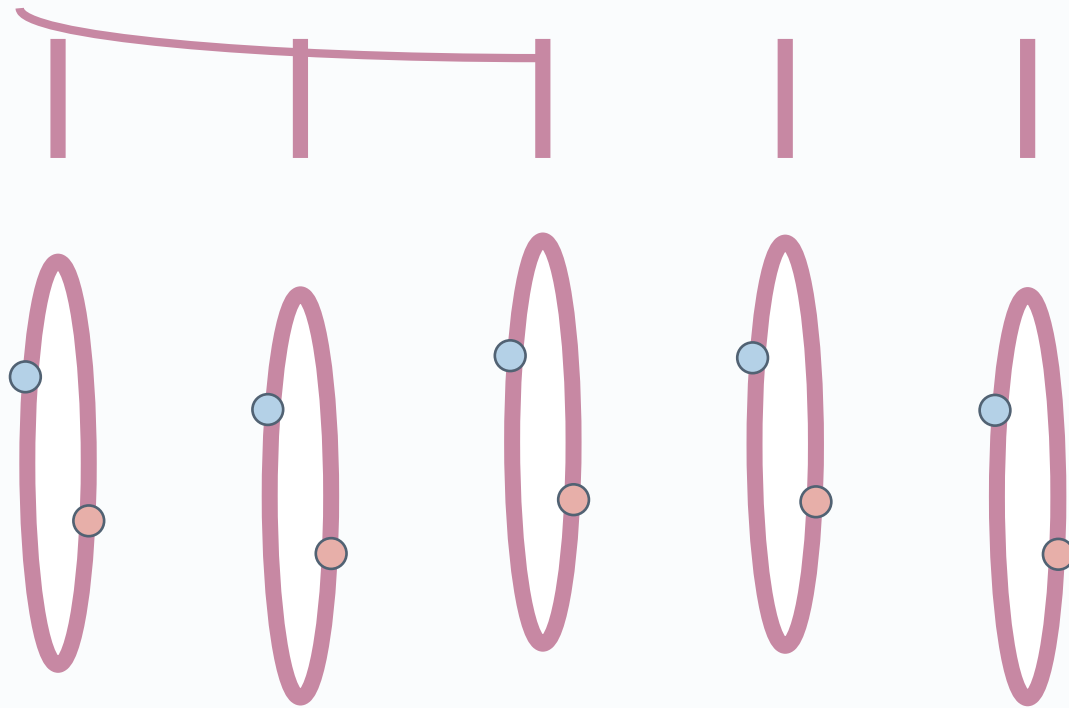
Lineage	Role in the source	Diagnostic relevance
Parietal cell	Secretes gastric acid	Present in fundic gland polyp lining
Chief cell	Produces digestive enzymes	Present in fundic gland polyp lining
Foveolar mucus cell	Mucus-secreting surface/pit lineage	Also lines polyp glands
Antral G cell	Secretes gastrin	Links reduced acid output to gastrin response

Gastric anatomy links gastrin and acid production



Antrum and oxyntic mucosa have distinct physiologic roles.

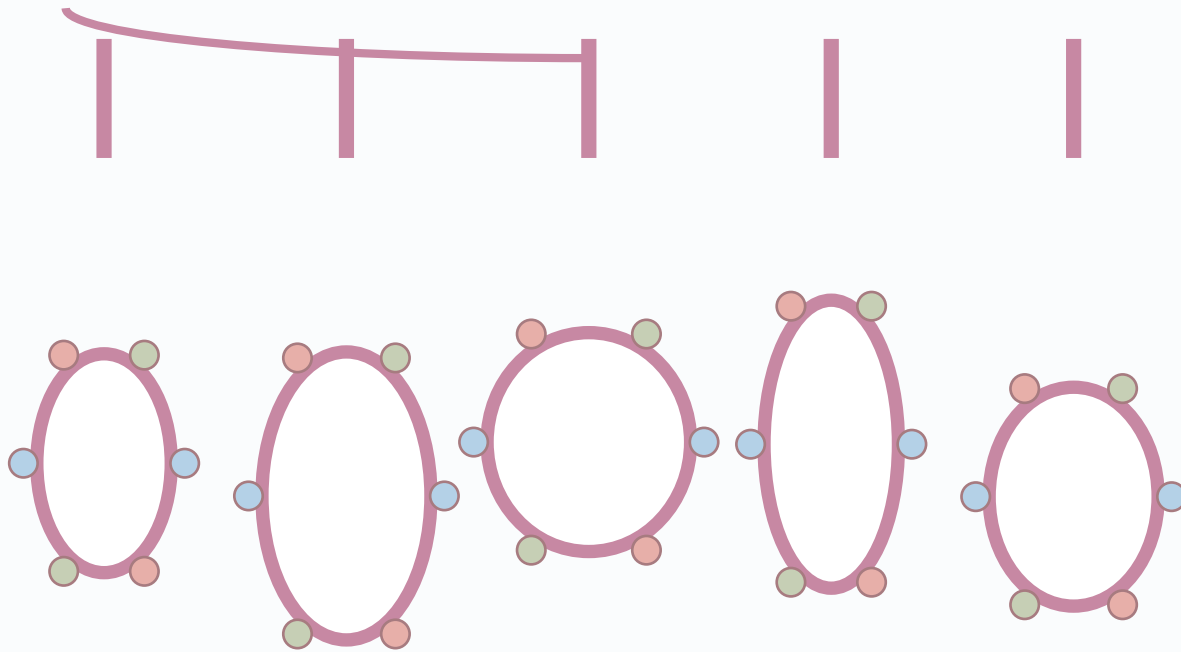
Normal architecture as a histologic reference



Schematic — not a histologic specimen

- Surface and foveolar epithelium overlie gastric glands.
- Body/fundus glands contain parietal and chief cells.
- A cystically expanded gland becomes conspicuous against this baseline.

Fundic gland polyp: A tissue-based definition



Schematic — not a histologic specimen

- A smooth, well-circumscribed lesion of gastric body or fundus.
- Microscopically, irregular glands are cystically dilated.
- Lining comprises parietal, chief and foveolar mucus cells.

Three clinical contexts, one characteristic morphology

Sporadic occurrence

**Proton pump inhibitor
association**

**Inherited APC or MUTYH
setting**

These are contexts, not a progression; Medication association can occur within sporadic disease.

Sporadic lesions are not synonymous with hereditary disease

Sporadic

- Fundic gland polyps can occur without a specified inherited predisposition.
- Sporadic prevalence has risen with widespread proton pump inhibitor use.

Syndromic

- Fundic gland polyps also occur with germline APC mutations.
- Germline MUTYH variants are another inherited association.

Proton pump inhibitor exposure is a major association

- Increased prevalence of sporadic fundic gland polyps to greater proton pump inhibitor use.
- The drug association has a defined physiologic pathway rather than simply co-occurring with a polyp.
- The association should be interpreted separately from inherited APC or MUTYH predisposition.

Interpretation

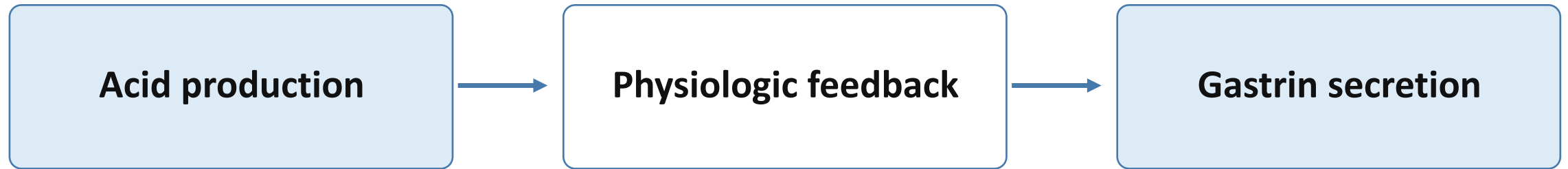
Medication history informs etiologic context; Tissue morphology defines the polyp.

Proton pump inhibitors suppress acid production



Inhibited acid production as the first step in the pathway.

Reduced acid output increases gastrin secretion



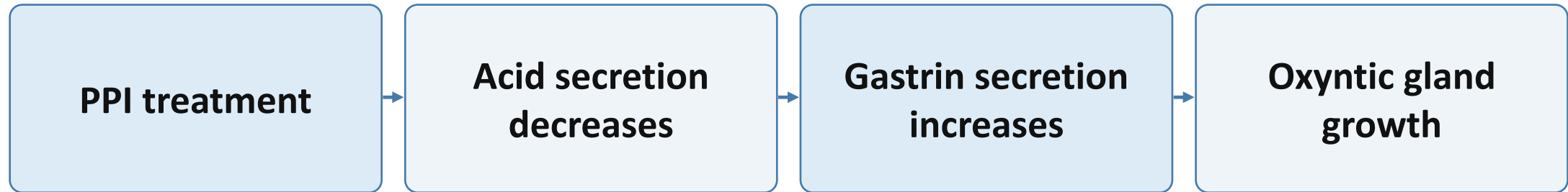
- Increased gastrin is a response to pharmacologic acid suppression.
- This step links a luminal functional change to glandular growth in the stomach.

Gastrin supports oxyntic gland growth



The source connects hypergastrinemia to oxyntic gland growth; Do not equate growth with dysplasia.

The PPI–gastrin–oxyntic growth sequence



Pathogenesis diagram — supported by Robbins 11e; No quantitative effect size is claimed.

A growth mechanism is not a cancer-risk estimate

Mechanistic association

- Acid suppression produces a gastrin-mediated growth response.
- The resulting polyp remains an oxyntic gland lesion.

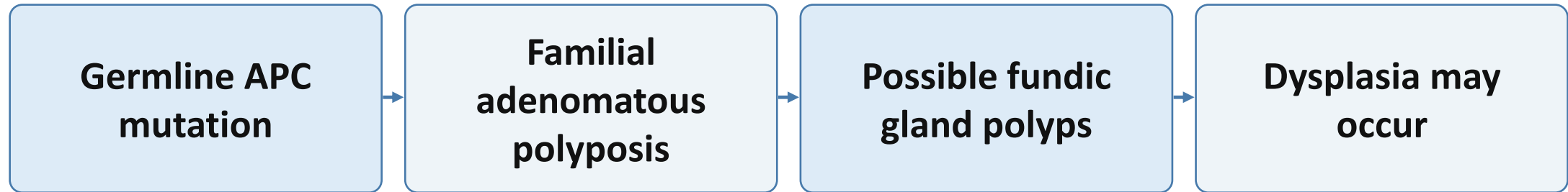
Risk interpretation

- Robbins does not assign a significant neoplastic risk to sporadic, including PPI-associated, polyps.
- The hereditary setting requires separate evaluation.

Inherited susceptibility is a distinct etiologic route

- Fundic gland polyps also occur with inherited cancer-predisposition syndromes.
- Robbins specifically names germline APC and MUTYH mutations.
- The importance of recognizing syndromic context is the possibility of dysplasia in FAP-associated lesions.

APC connects fundic gland polyps with FAP



The FAP-associated dysplasia statement is explicit in the supplied source.

MUTYH is an inherited DNA repair association

What the source states

- MUTYH is a DNA repair gene.
- Germline MUTYH variants occur in a subset of individuals with fundic gland polyps.

Interpretive boundary

- Presence of a polyp alone does not prove a MUTYH-associated syndrome.
- The excerpt does not quantify MUTYH-specific dysplasia risk.

Genetic background cannot be read from polyp shape

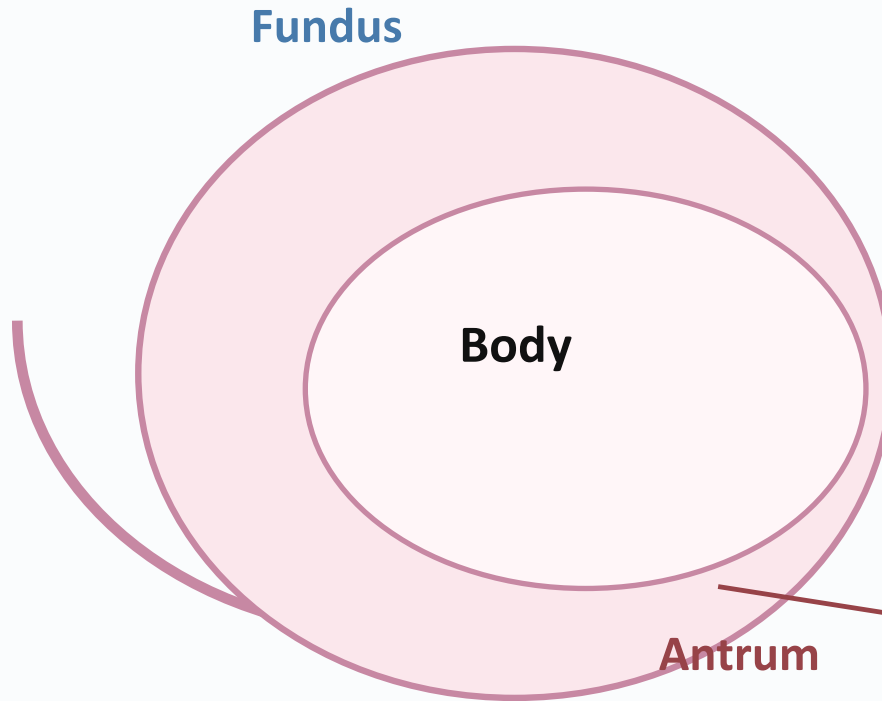
Endoscopic appearance

- Smooth surface
- Body/fundus location
- Single or multiple

Inherited status

- Requires the clinical/genetic context
- Not assigned by gross appearance alone
- Influences concern about dysplasia

Location is a practical morphologic anchor



Regional schematic

- Classic fundic gland polyps are centered in the gastric body and fundus.
- Location aligns with parietal- and chief-cell-rich oxyntic mucosa.
- A lesion at another site warrants reassessment of the full morphologic pattern.

Typical external contour is smooth

Smooth mucosal elevations — schematic



Not a patient endoscopy image

- The mucosal surface is smooth rather than eroded in the classic description.
- A visually bland contour is compatible with a fundic gland polyp.
- Surface appearance cannot replace histologic typing.

Fundic gland polyps are well circumscribed

Smooth mucosal elevations — schematic



Not a patient endoscopy image

- A discrete, well-circumscribed mucosal lesion.
- The contour reflects a localized polyp rather than a diffuse rugal process.
- The microscopic architecture, not the border alone, supplies specificity.

Polyp multiplicity is variable

Single lesion

- Compatible with fundic gland polyp
- Does not establish sporadic status

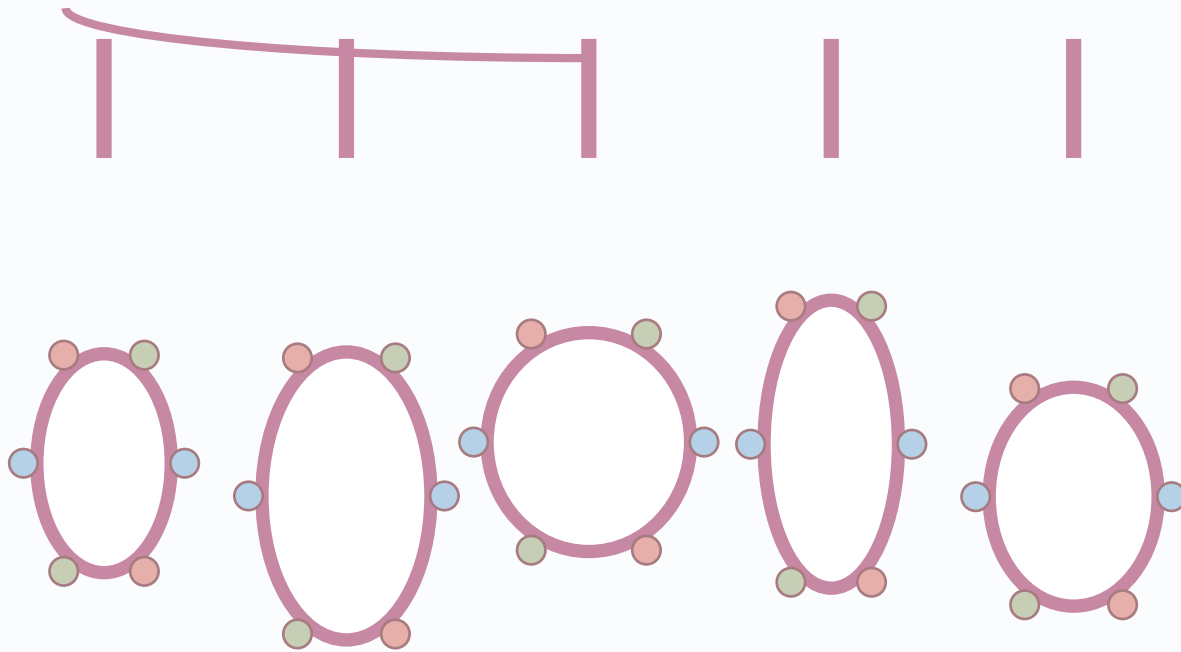
Multiple lesions

- Also compatible with fundic gland polyps
- Prompts attention to PPI use and inherited context

What gross examination can and cannot establish

Gross/endoscopic observation	Supported interpretation
Body or fundus	Consistent anatomic compartment
Smooth surface	Consistent with classic fundic gland polyp
Discrete circumscription	Supports localized polypoid lesion
One versus several polyps	Both patterns possible; Etiology not settled
Surface alone	Insufficient to assess dysplasia

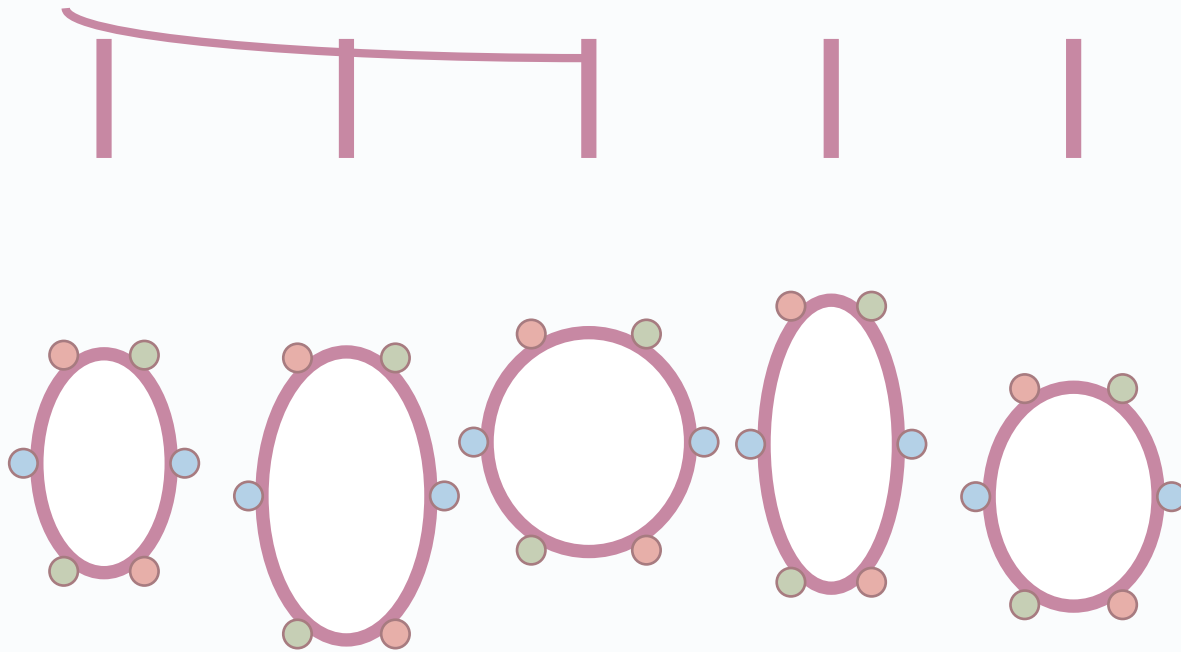
Cystic dilatation is the core microscopic feature



Schematic — not a histologic specimen

- Glandular lumina are enlarged, often conspicuously.
- Dilatation is a defining architectural clue rather than evidence of tissue invasion.
- Cystic change must be interpreted with gland type and inflammation.

The expanded glands are also irregular



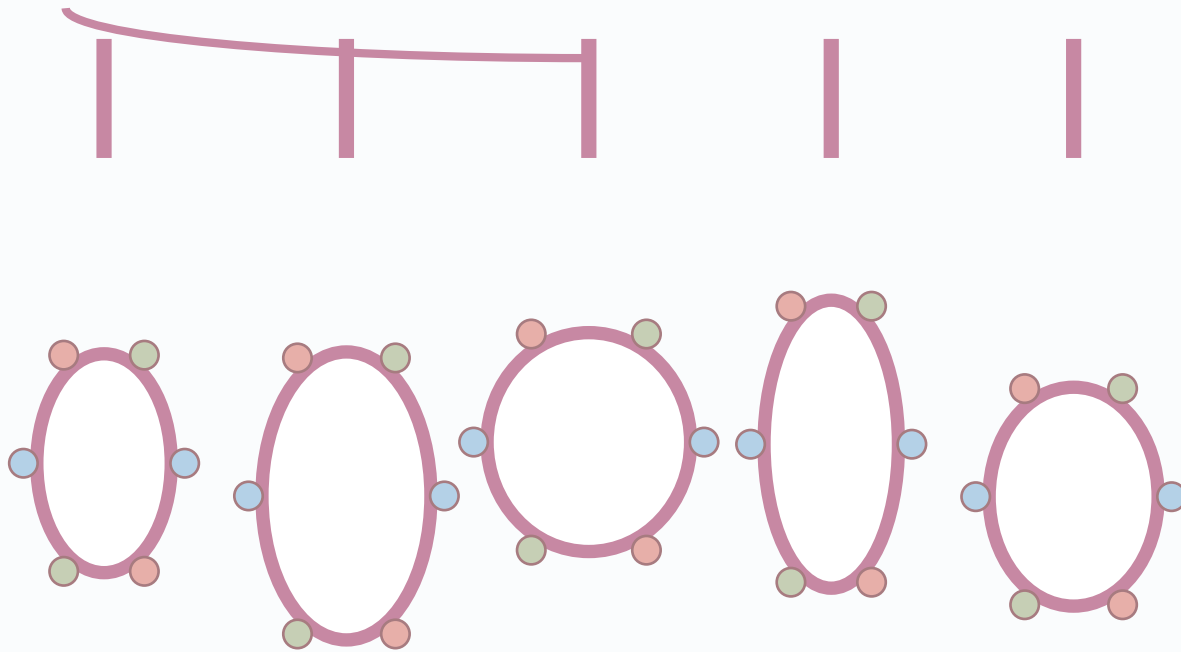
Schematic — not a histologic specimen

- Glands vary in shape instead of remaining uniformly narrow.
- Irregular cystic spaces alter the distribution of oxyntic mucosal glands.
- These changes create the recognizable low-power pattern.

Three epithelial lineages may line the cysts

Lining cell type	Relevant feature
Parietal cells	Oxyntic, acid-producing lineage
Chief cells	Oxyntic, enzyme-producing lineage
Foveolar mucus cells	Gastric mucus-secretory lineage

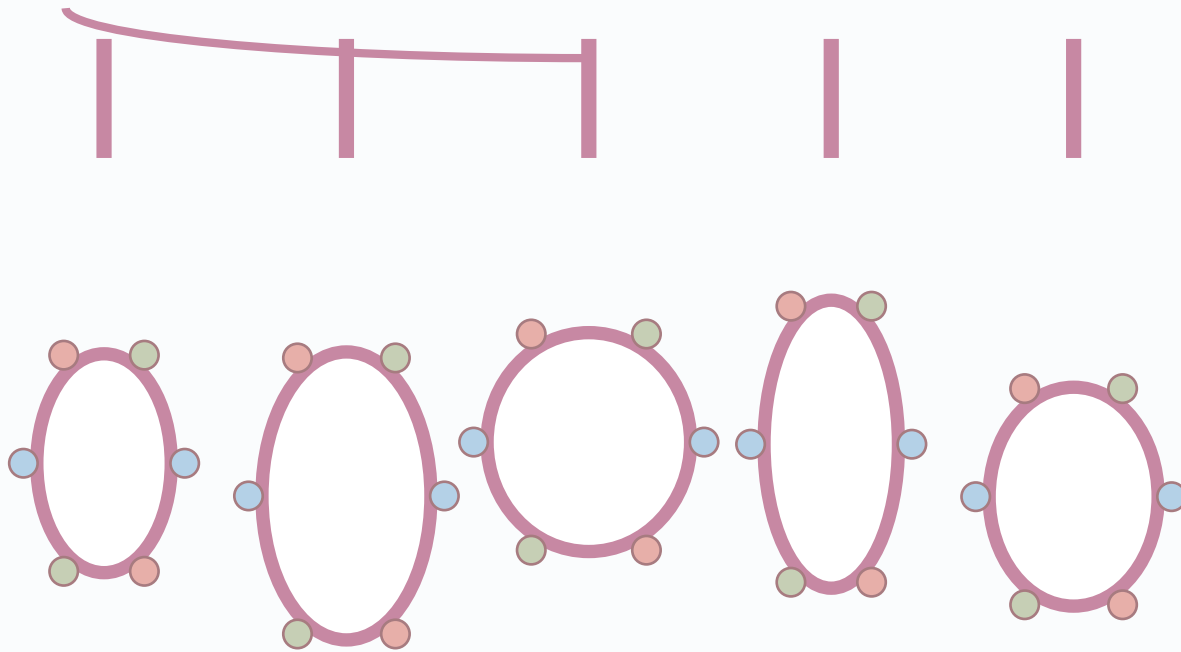
Parietal cells confirm oxyntic differentiation



Schematic — not a histologic specimen

- Parietal cells belong to normal body/fundus gland mucosa.
- They may line the dilated irregular glands of a fundic gland polyp.
- Their presence helps relate the lesion to oxyntic tissue.

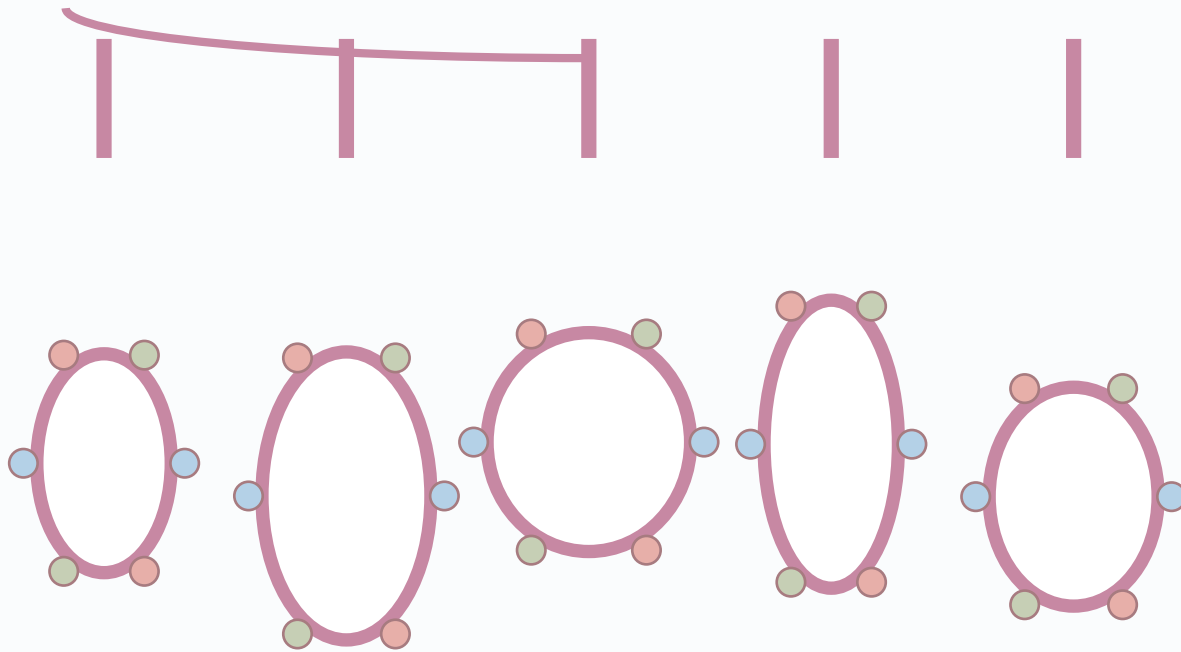
Chief cells contribute a second oxyntic lineage



Schematic — not a histologic specimen

- Chief cells normally produce digestive enzymes.
- They are among the cells lining the glandular spaces of a fundic gland polyp.
- Thus the lesion is not merely foveolar mucous-cell hyperplasia.

Foveolar mucus cells complete the lining pattern



Schematic — not a histologic specimen

- Foveolar mucus cells may line the cystically dilated glands.
- The combination of foveolar and oxyntic lineages is more informative than cysts alone.
- This mixed lining should be assessed together with the stromal background.

Inflammation is absent or minimal in typical lesions

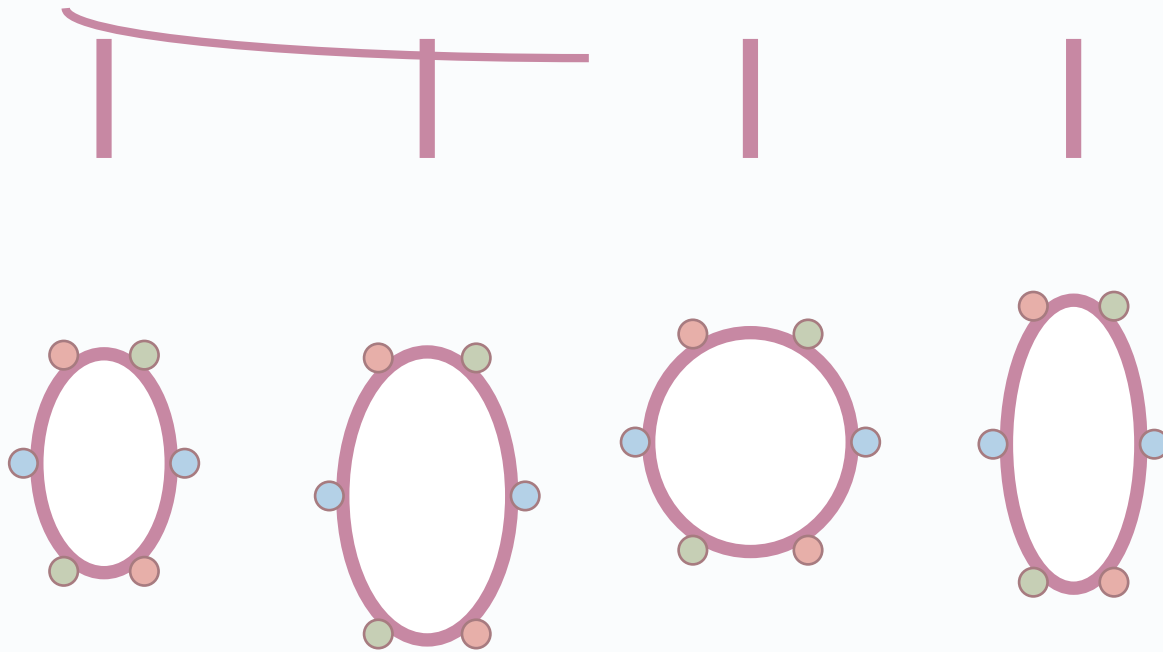
Fundic gland polyp

- Cystically dilated oxyntic glands
- Typically no or minimal inflammation

Inflammatory/hyperplastic polyp

- Edematous lamina propria
- Variable acute and chronic inflammation

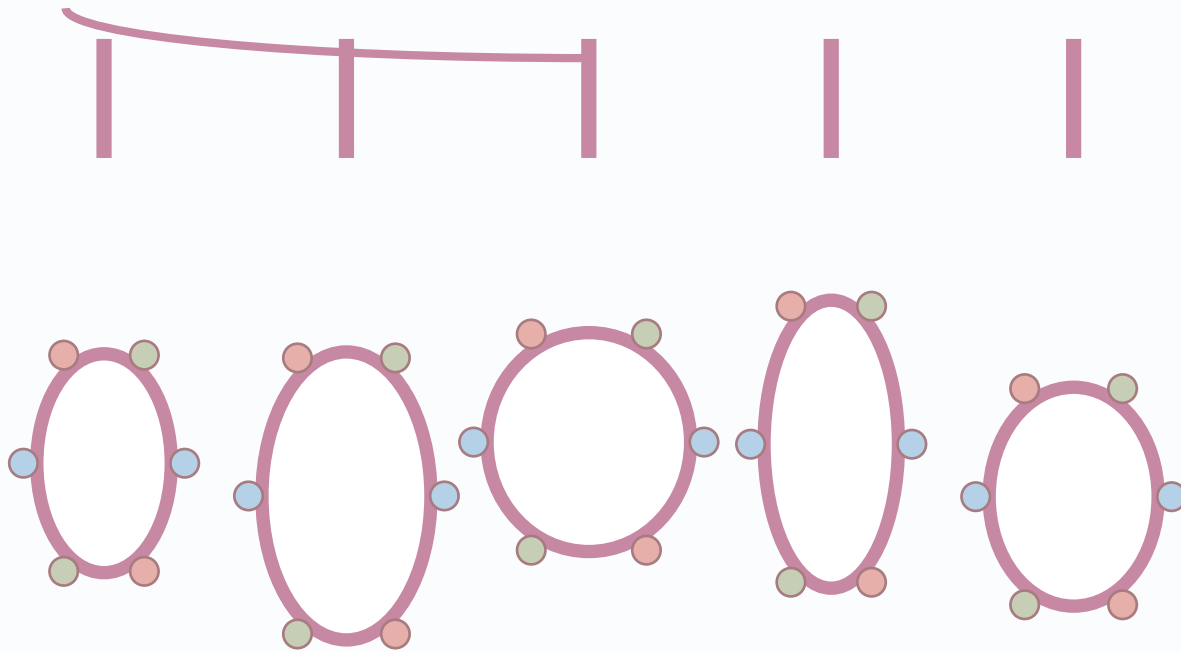
Low-power recognition: Gland dilation beneath mucosa



Schematic — not a histologic specimen

- Seek expanded glandular spaces within a polypoid mucosal fragment.
- Confirm that the lesion is composed of glands rather than a solid cell proliferation.
- This is an original schematic, not a patient photomicrograph.

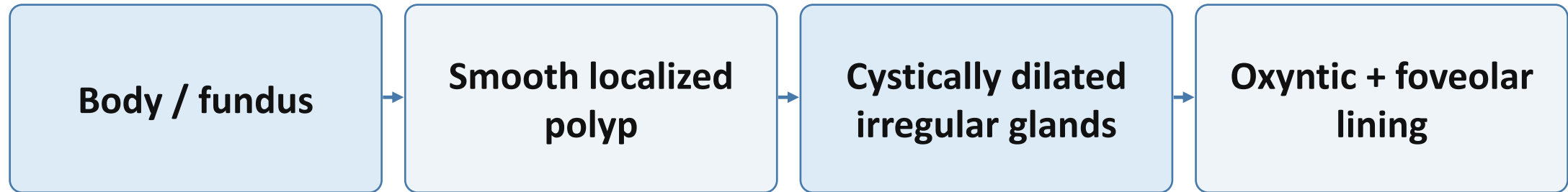
Higher-power recognition: Epithelial composition



Schematic — not a histologic specimen

- Inspect the actual gland lining for oxyntic components.
- Parietal, chief and foveolar cells form the described epithelial mixture.
- Document any atypical architecture or nuclear changes rather than assuming blandity.

Recognition depends on convergent findings



Minimal inflammation strengthens the classic pattern.

The major histologic rival is a hyperplastic polyp

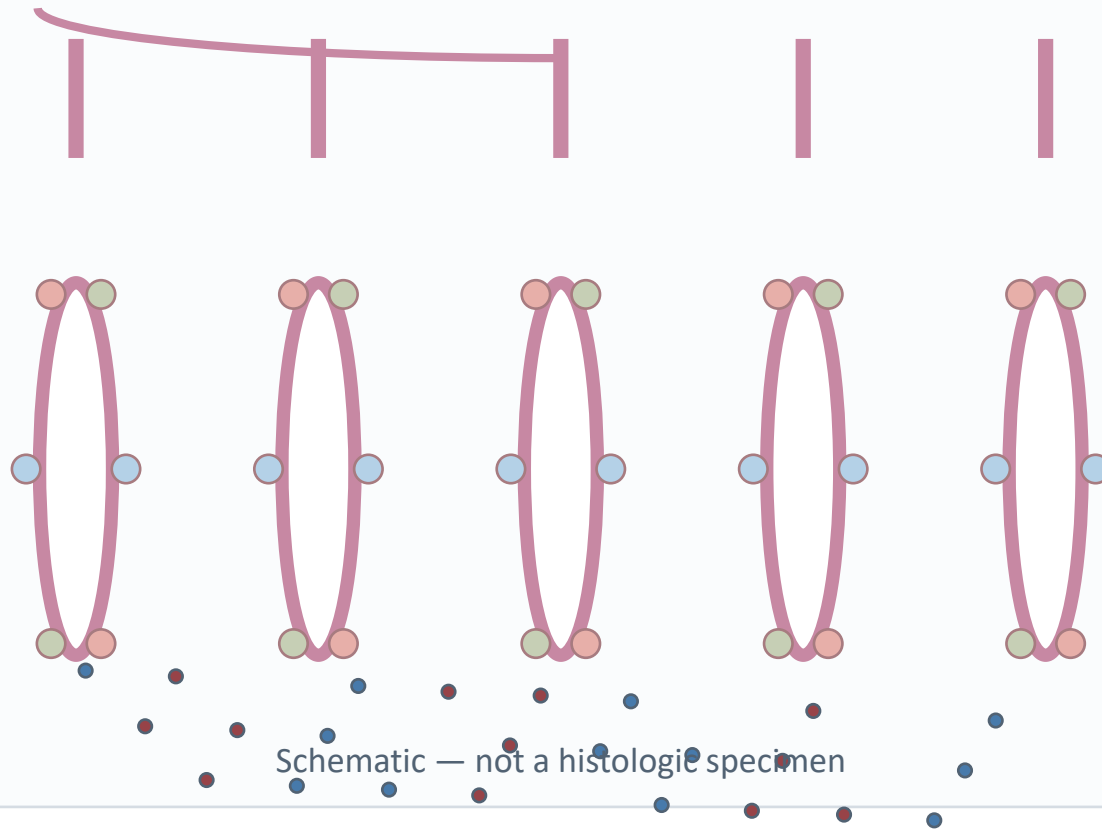
Fundic gland polyp

- Cystically dilated irregular glands
- Parietal and chief cells among lining

Hyperplastic polyp

- Elongated, irregular foveolar glands
- Edematous inflamed lamina propria

Hyperplastic polyps emphasize foveolar architecture



- Irregular, cystically dilated and elongated foveolar glands.
- Corkscrew-shaped foveolar structures may be prominent.
- Cystic gland change alone is not specific for fundic gland polyps.

Inflamed stroma helps separate the patterns

Feature	Fundic gland polyp	Inflammatory / hyperplastic
Inflammation	Absent or minimal	Variable acute and chronic
Lamina propria	No defining edema stated	Typically edematous
Gland lineage	Oxyntic + foveolar	Predominantly foveolar

Gastric adenoma is a neoplastic comparator

- A gastric adenoma is distinguished by a dysplastic epithelial phenotype.
- Robbins commonly places gastric adenomas in a background of atrophy and intestinal metaplasia.
- Unlike classic fundic gland polyps, adenoma classification fundamentally depends on epithelial dysplasia.

Adenoma features include nuclear alteration

Adenoma

- Epithelial nuclear hyperchromasia
- Nuclear pseudostratification
- Dysplastic epithelial growth

Fundic gland polyp

- Cystically dilated glands
- Parietal / chief / foveolar lining
- Dysplasia risk depends on setting

Core differential: Three diagnostic patterns

Feature	Fundic gland	Hyperplastic	Adenoma
Dominant change	Oxyntic gland cysts	Foveolar elongation	Epithelial dysplasia
Inflammation	Usually scant	Often conspicuous	Variable
Key interpretation	Context-dependent risk	Reactive/inflammatory	Neoplastic lesion

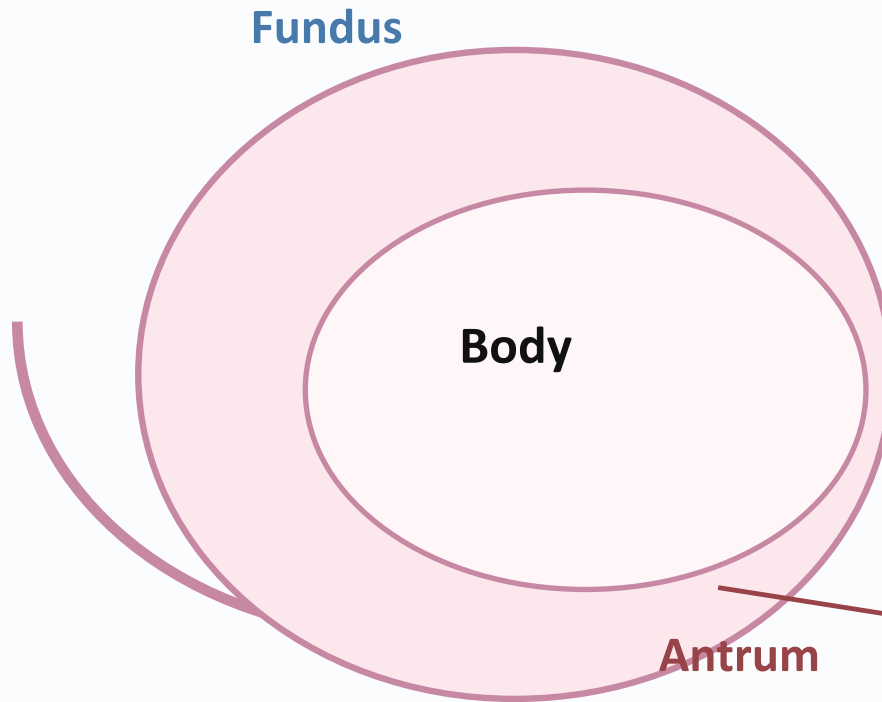
The word “cystic” is not itself a diagnosis

- Both fundic gland polyps and hyperplastic polyps may have cystic gland dilatation.
- The discriminators are glandular cell composition, foveolar elongation, and stromal inflammation.
- Classification requires the entire architecture and cytology, not one isolated feature.

Interpretation

Architecture + cell
lineage +
inflammation > cysts
alone.

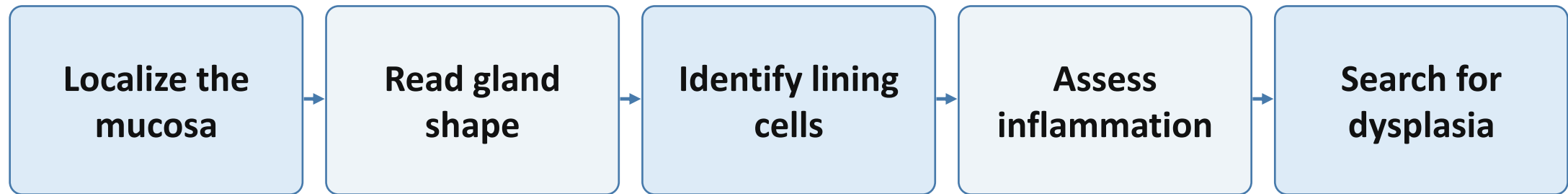
Antral gland and body gland origins differ



Regional schematic

- Body/fundus are the main oxyntic compartment and typical fundic gland polyp site.
- Antrum contains gastrin-secreting G cells and differs in gland composition.
- The regional map explains both morphology and the PPI feedback pathway.

A reproducible morphology-reading sequence



Teaching synthesis of source findings, not a formal society-endorsed algorithm.

Dysplasia requires a contextual interpretation

When FAP is present

- Dysplasia may occur in FAP-associated fundic gland polyps.
- Rare cancers have been reported in this setting.

When lesions are sporadic

- No significant neoplastic risk.
- This statement includes PPI-associated sporadic polyps.

FAP-associated polyps can show dysplasia

Dysplasia may occur

Do not extrapolate to every fundic gland polyp

- FAP is linked to germline APC mutation.
- The source flags dysplasia specifically in the FAP-associated setting.

Rare cancers have been reported in FAP

Rare cancers reported

Not equivalent to a quantified transformation rate

- Rare cancers associated with FAP-associated fundic gland polyps.
- No numerical frequency or staging algorithm is supplied in the excerpt.

Sporadic fundic gland polyps have a different risk

No significant neoplastic risk

As characterized by Robbins, 11th edition

- The sporadic category contrasts with FAP-associated lesions.
- Do not transfer inherited risk to a sporadic diagnosis without evidence.

PPI-associated lesions share the sporadic risk statement

No significant neoplastic risk

Includes sporadic polyps arising with PPI therapy

- PPI exposure is linked to the rise in sporadic fundic gland polyps.
- The excerpt distinguishes this association from familial dysplasia risk.

Risk stratification depends on disease context

Clinical setting	What Robbins supports
Sporadic fundic gland polyp	No significant neoplastic risk
PPI-associated sporadic polyp	No significant neoplastic risk
FAP-associated fundic gland polyp	Dysplasia may occur; Rare cancers reported
MUTYH-associated setting	Association established; Specific dysplasia rate not provided

Symptoms are often absent

- Fundic gland polyps may be completely asymptomatic.
- The endoscopic detection of a polyp does not mean it caused the presenting complaint.
- Histologic classification should remain separate from symptom attribution.

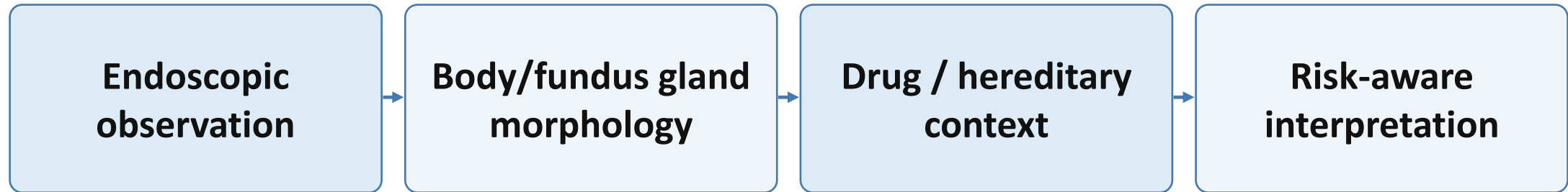
Interpretation

Asymptomatic is explicitly within the clinical spectrum.

Symptomatic patients can have nonspecific complaints

- Nausea is a reported associated symptom.
- Vomiting and epigastric pain are also reported.
- These complaints do not distinguish a fundic gland polyp from other gastric disorders on their own.

Clinical reasoning needs both context and tissue



This framework derives from the source; It is not a procedural management guideline.

Case A — multiple polyps during PPI therapy

Teaching vignette: Endoscopy identifies several smooth body/fundus polyps in an individual taking a proton pump inhibitor. Biopsy shows cystically dilated oxyntic glands with little inflammation.

Which association and risk statement are most consistent with Robbins?

Suggested interpretation

PPI-associated sporadic fundic gland polyps; No significant neoplastic risk assigned.

Case B — fundic gland polyp in FAP

Teaching vignette: A patient with familial adenomatous polyposis has a fundic gland polyp. A biopsy shows epithelial dysplasia.

Why does this result require a different interpretation from Case A?

Suggested interpretation

Robbins specifically describes dysplasia in FAP-associated fundic gland polyps and rare reported cancers.

Case C — cystically dilated foveolar glands

Teaching vignette: A gastric polyp has elongated irregular foveolar glands, edematous lamina propria, and a prominent inflammatory infiltrate.

What diagnosis is better supported than a classic fundic gland polyp?

Suggested interpretation

An inflammatory / hyperplastic gastric polyp.

Case D — hyperchromasia and pseudostratification

Teaching vignette: A gastric polyp is composed of dysplastic epithelium with nuclear hyperchromasia and pseudostratification.

Which comparator should be considered?

Suggested interpretation

Gastric adenoma, rather than an uncomplicated fundic gland polyp.

A five-step clinicopathologic checklist

- Confirm gastric body/fundus location where documented.
- Recognize cystically dilated irregular gland architecture.
- Identify parietal, chief and foveolar lining components.
- Assess inflammation and actively evaluate epithelial atypia.
- Incorporate PPI use, APC/FAP or MUTYH-associated context.

Interpretation

The checklist integrates supplied textbook findings; Not a formal guideline.

Summary: The defining discriminators

Dimension	Fundic gland polyp
Site	Body and fundus
Gross	Smooth; Well circumscribed; Single or multiple
Microscopy	Irregular cystic glands; Parietal, chief, foveolar cells
Inflammation	Typically absent or minimal
Clinical association	Sporadic, PPI exposure, APC/FAP, MUTYH
Risk	Sporadic low; FAP-linked dysplasia possible

Selected source and visual references

- Robbins, Cotran & Kumar. Pathologic Basis of Disease, 11th ed. (2026). Chapter 17, pp. 696, 704–705.
- Robbins Figure 17.19 caption: fundic gland polyp with cystically dilated glands lined by parietal, chief, and foveolar cells.
- Original editable schematics in this lecture; no textbook micrographs or third-party histologic images reproduced.