

Endometrial Polyps

Pathologic anatomy, stromal biology, morphology, differential diagnosis, and clinical correlation

Pathology of a focal endometrial lesion

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Learning objectives

- Locate a polyp within normal endometrial anatomy and the abnormal uterine bleeding differential.
- Explain its predominantly stromal neoplastic interpretation and hormonal context.
- Recognize characteristic tissue features and clinically relevant diagnostic pitfalls.
- Apply pathology findings to bleeding, infertility, and postmenopausal presentations.

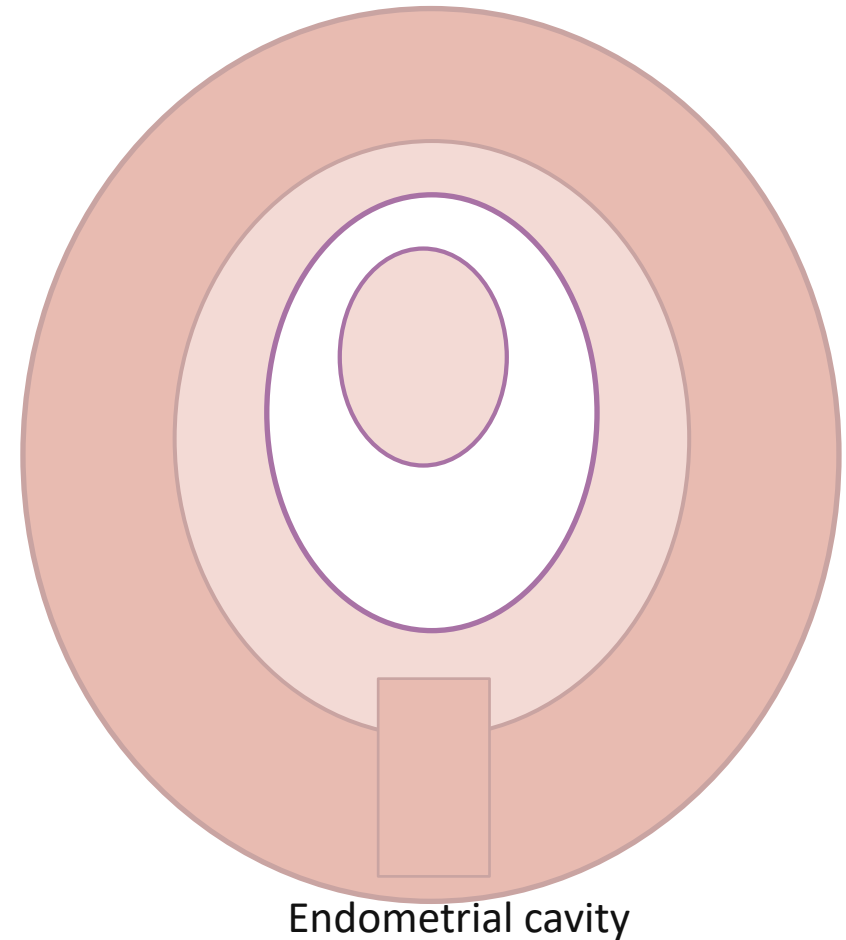
What defines an endometrial polyp?

- A localized exophytic mass projecting into the endometrial cavity.
- A lesion of variable size and attachment, composed of endometrial tissue.
- Usually benign; Uncommon examples harbor adenocarcinoma.

FOCAL · INTRACAVITARY

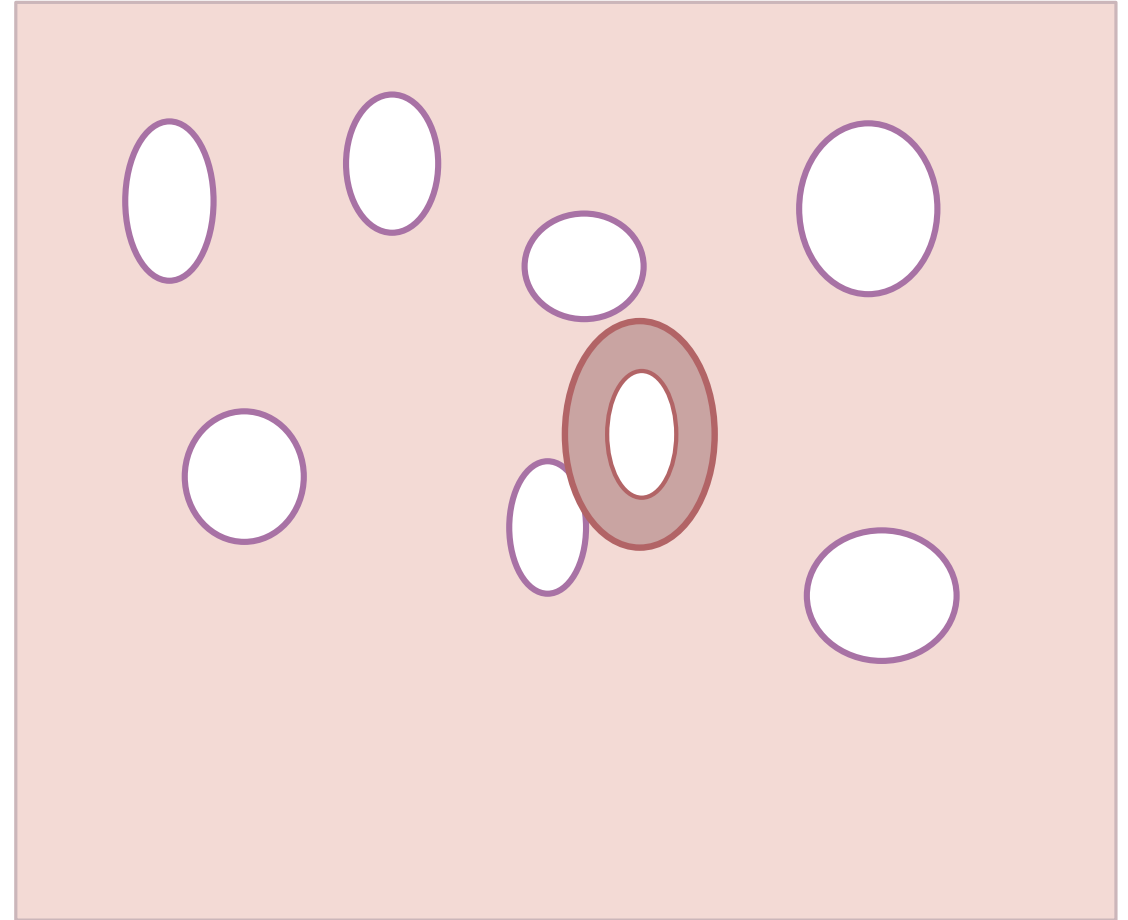
The uterine corpus has two tissue compartments

- Myometrium: Interwoven smooth-muscle bundles forming the uterine wall.
- Endometrium: Glands embedded in cellular stroma lining the uterine cavity.
- A polyp projects from the endometrial lining into that cavity.



The endometrium contains glands and stroma

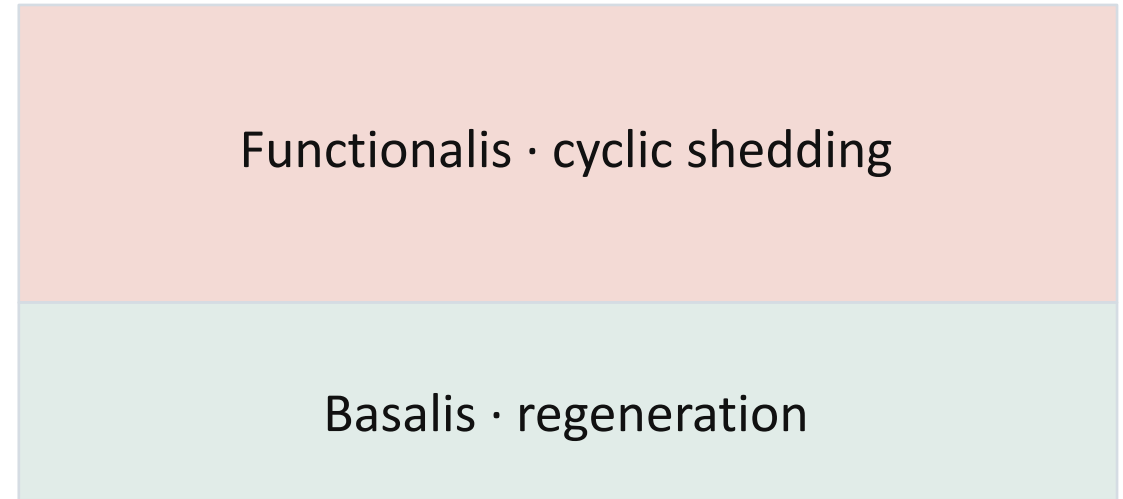
- Endometrial glands supply the epithelial compartment.
- Stromal cells form the supporting cellular connective tissue.
- For polyps, the stromal component is especially important in interpreting pathogenesis.



Schematic · not a histologic specimen

Functionalis versus basalis

- Functionalis: Superficial endometrium shed during menstruation.
- Basalis: Deeper endometrium from which the lining regenerates.
- Polypoid growth is a focal structural lesion, distinct from normal cyclic renewal.



The proliferative endometrium is hormonally active

- Estrogen promotes proliferation of glands and stroma.
- Glands are usually relatively straight and tubular, lined by proliferating epithelium.
- Stromal cells also proliferate during this phase.

Estrogen

Starting observation



Gland + stroma

Intermediate step



Proliferation

Interpretation / action

Normal endometrium · hormone sequence

The secretory endometrium changes after ovulation

- Progesterone induces glandular differentiation and stromal functional change.
- It suppresses additional estrogen-driven endometrial proliferation.
- Normal cyclic hormone responsiveness provides the comparison for a polyp.

Ovulation

Starting observation



Progesterone

Intermediate step



Differentiation

Interpretation / action

Normal endometrium · hormone sequence

Gland–stroma signaling mediates hormone effects

- Estrogen acts through nuclear receptors in both tissue compartments.
- Stromal growth factors support epithelial proliferation.
- Progesterone lowers estrogen receptor expression during the secretory phase.

Ovarian estrogen

Starting observation



Stromal signaling

Intermediate step



Gland + stroma growth

Interpretation / action

Normal endometrium · simplified mechanism

Abnormal uterine bleeding has two broad contexts

- Structural pathology: Polyps, submucosal leiomyomas, endometrial neoplasms, inflammation.
- Nonstructural functional bleeding: Commonly hormonal or anovulatory.
- Identifying a focal mass changes the pathologic differential.

Structural

Polyp · leiomyoma · neoplasia · inflammation

Functional

Anovulatory / endocrine disturbance

Simplified differential categories · not exhaustive

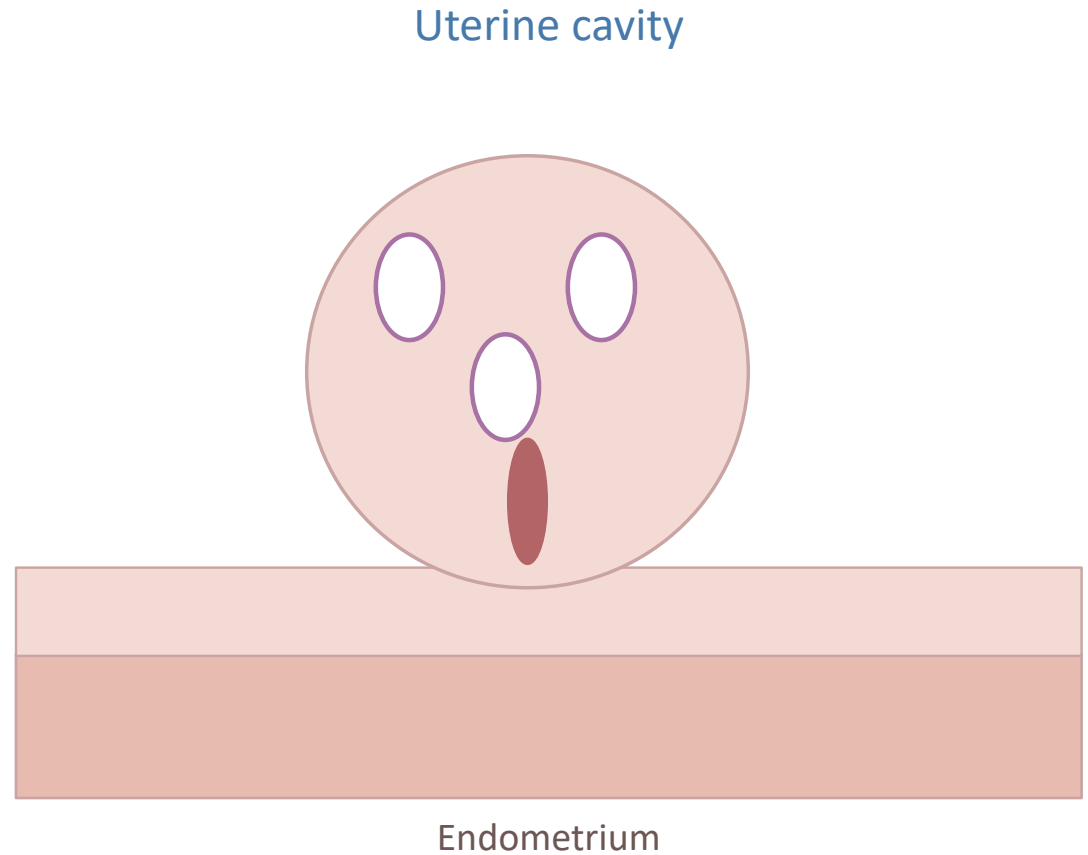
Why a polyp belongs in the structural differential

- The lesion is visible as a focal intracavitary growth, rather than only altered cycling.
- It may produce abnormal bleeding, although some polyps remain silent.
- Histologic assessment must also consider coexisting endometrial disease.

Focal tissue finding + clinical context

Exophytic growth distinguishes a polyp

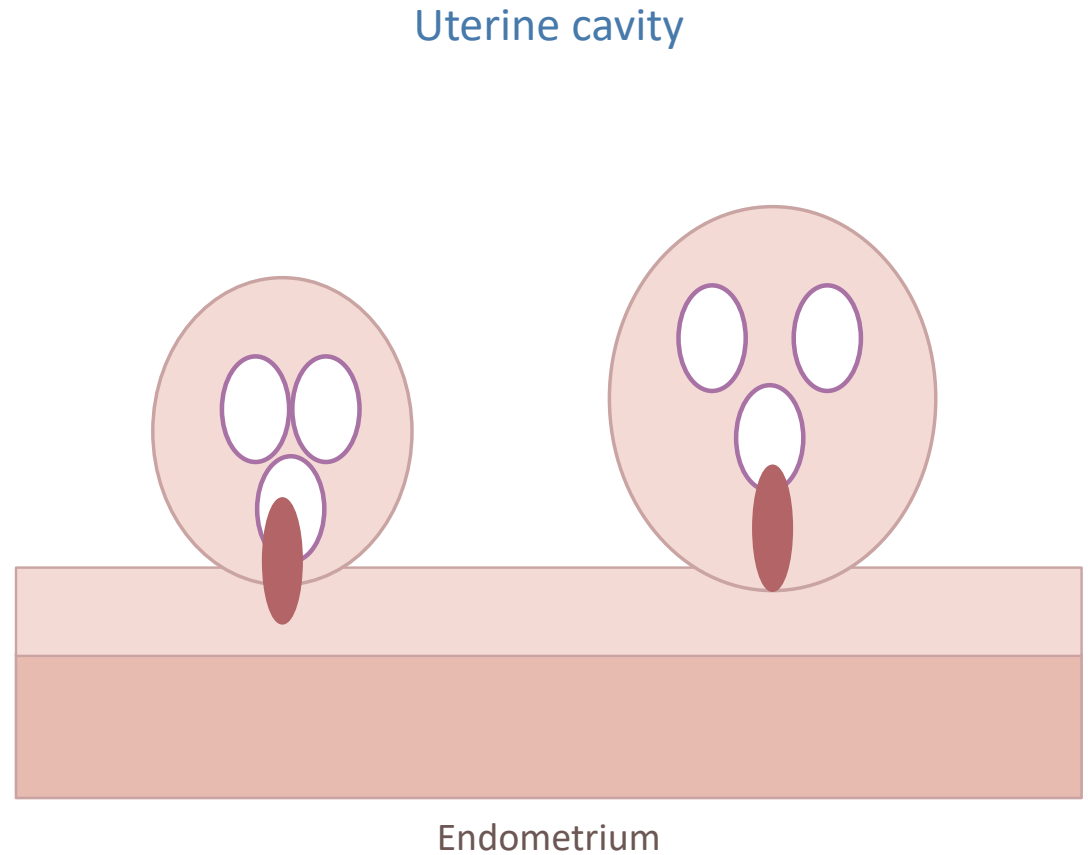
- The base originates in the endometrium.
- The bulk of the mass extends toward the uterine lumen.
- A growth configuration is not, by itself, a diagnosis of benignity.



Schematic · endometrium and intracavitary projection

Polyps may be solitary or multiple

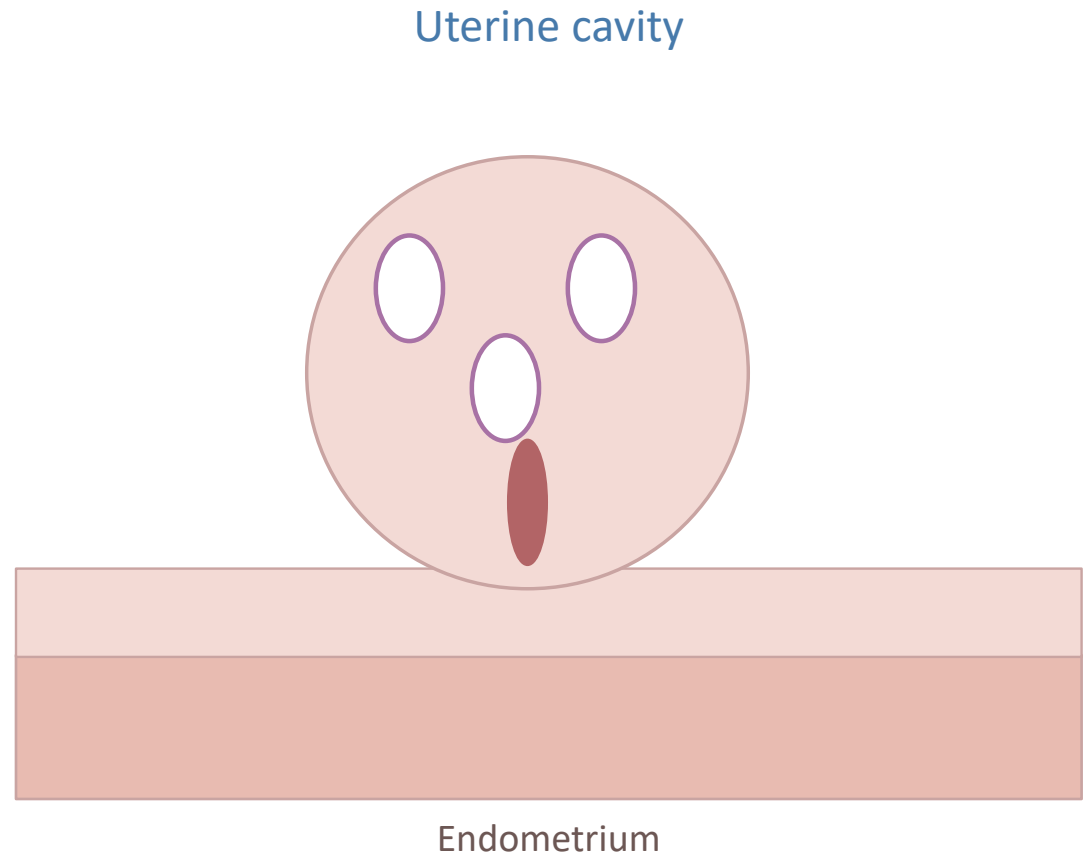
- A single localized mass is possible.
- Several separate masses may coexist.
- Multiplicity changes the gross appearance without redefining the lesion.



Schematic · endometrium and intracavitary projection

Sessile polyps have a broad attachment

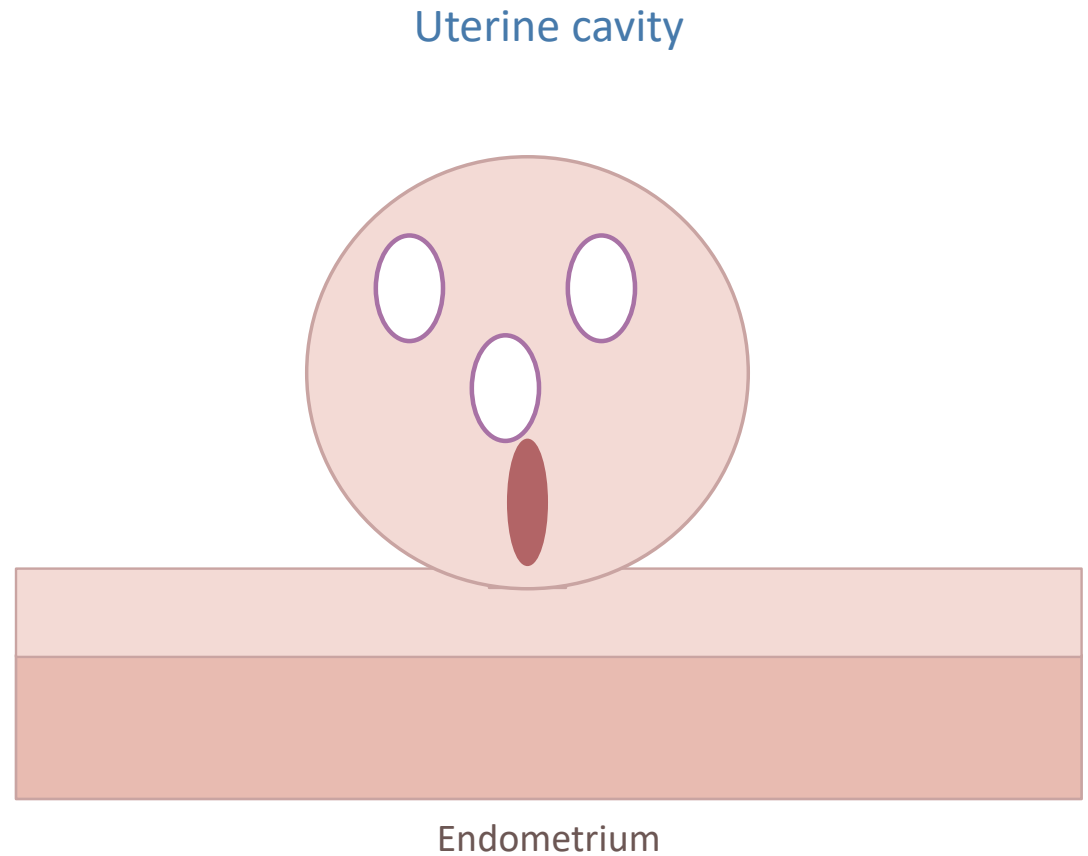
- Most endometrial polyps are sessile.
- The polyp merges with the endometrial surface through a relatively broad base.
- Distinguish attachment shape from lesion size.



Schematic · endometrium and intracavitary projection

A pedunculated polyp has a stalk

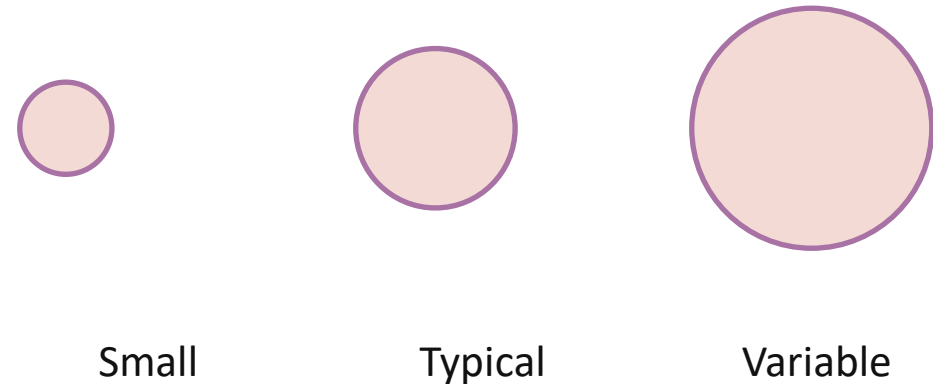
- Larger lesions may project on a narrow pedicle.
- The stalk connects the mass to its site of origin.
- Both pedunculated and sessile forms qualify as endometrial polyps.



Schematic · endometrium and intracavitary projection

Typical polyp dimensions are modest

- Most as approximately 0.5–3 cm in diameter.
- Exceptionally, polyps can become considerably larger.
- Size varies; It is not a stand-alone benign-versus-malignant criterion.



Usual diameter: 0.5–3 cm

Gross description: Four separate observations

- Count: Single or multiple.
- Contour: Focal projection into the cavity.
- Attachment: Sessile or pedunculated.
- Dimensions: Measure the lesion rather than assuming a standard size.

Focal growth differs from diffuse glandular proliferation

Focal polyp

Localized cavity projection

Variable attachment and size

Evaluate lesion plus background

Diffuse hyperplasia

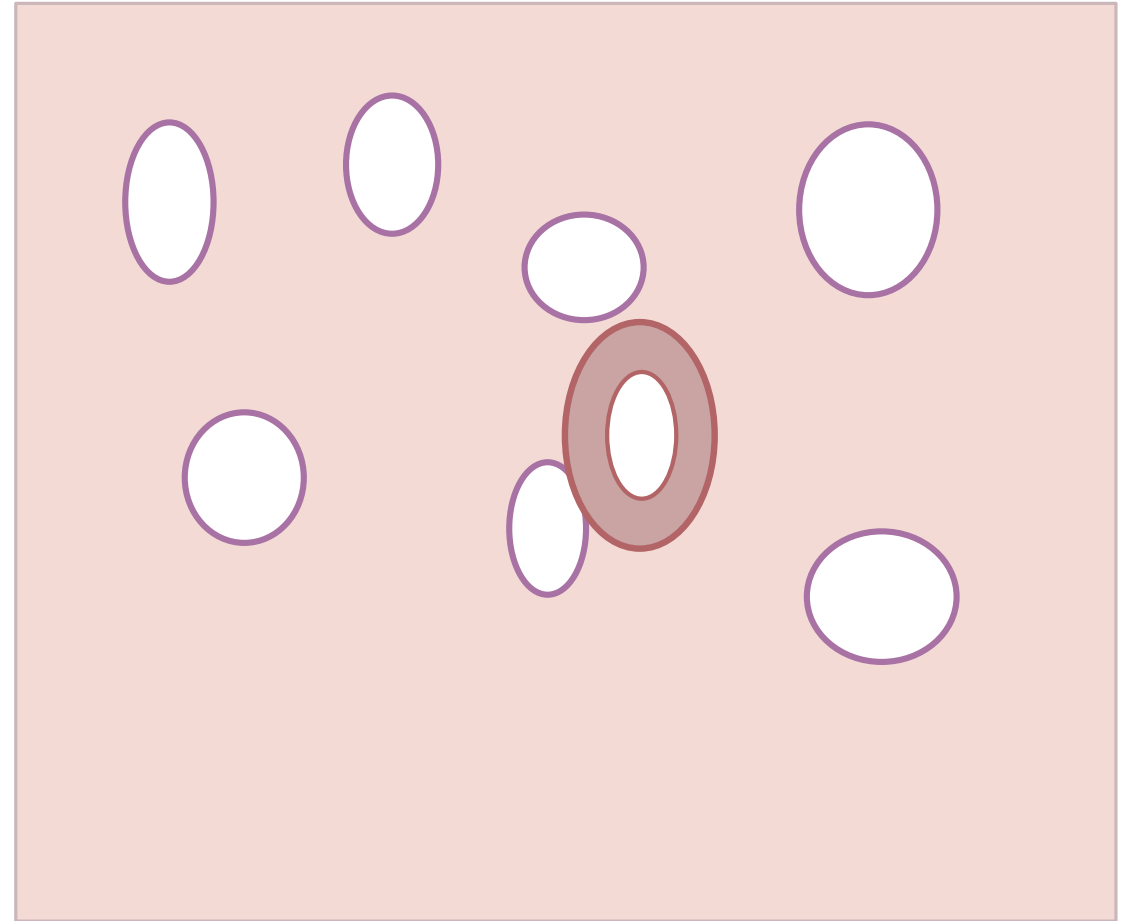
Gland crowding relative to stroma

Microscopic endometrial architectural change

Evaluate distribution and cytology

Characteristic histology uses multiple tissue clues

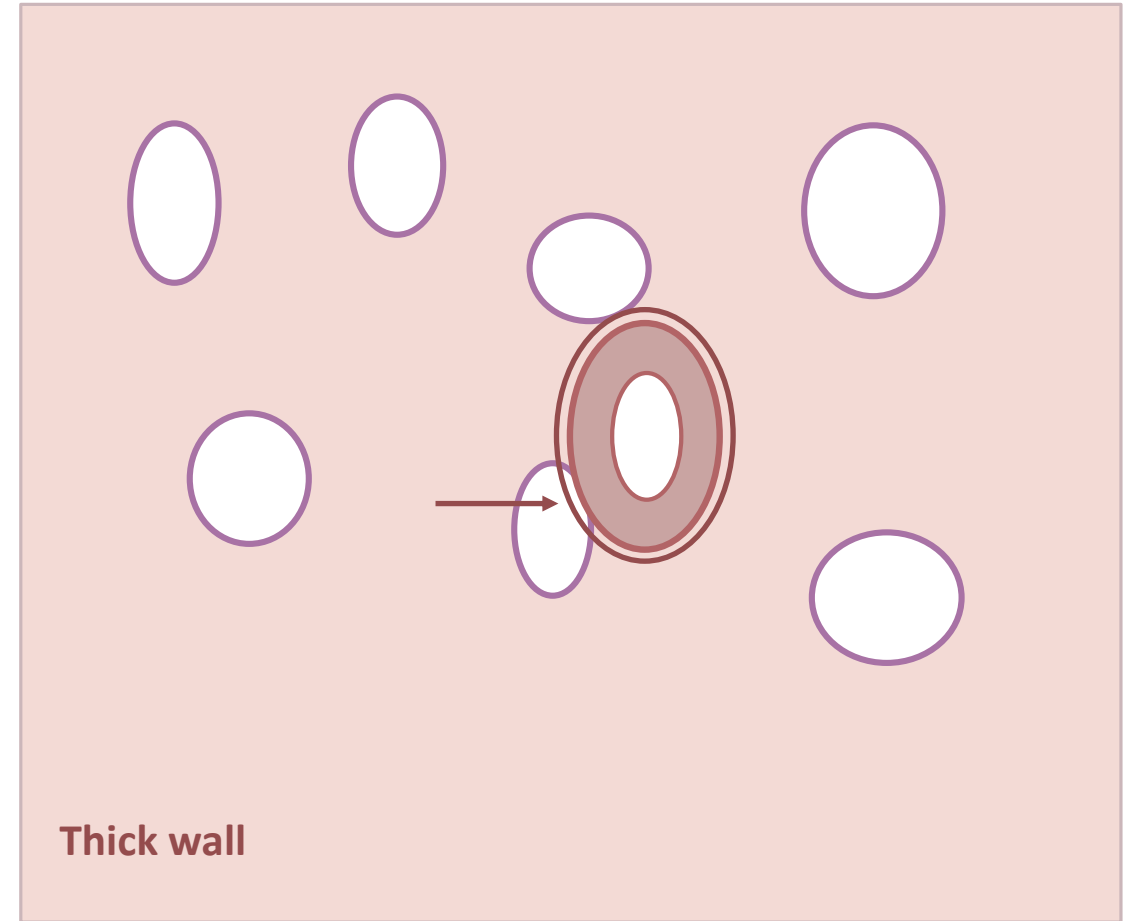
- Recognize an endometrial-type epithelial surface and glands.
- Assess the stromal composition and vascular structures.
- Interpret the whole architecture, not one gland or vessel in isolation.



Schematic · not a histologic specimen

Thick-walled blood vessels support the diagnosis

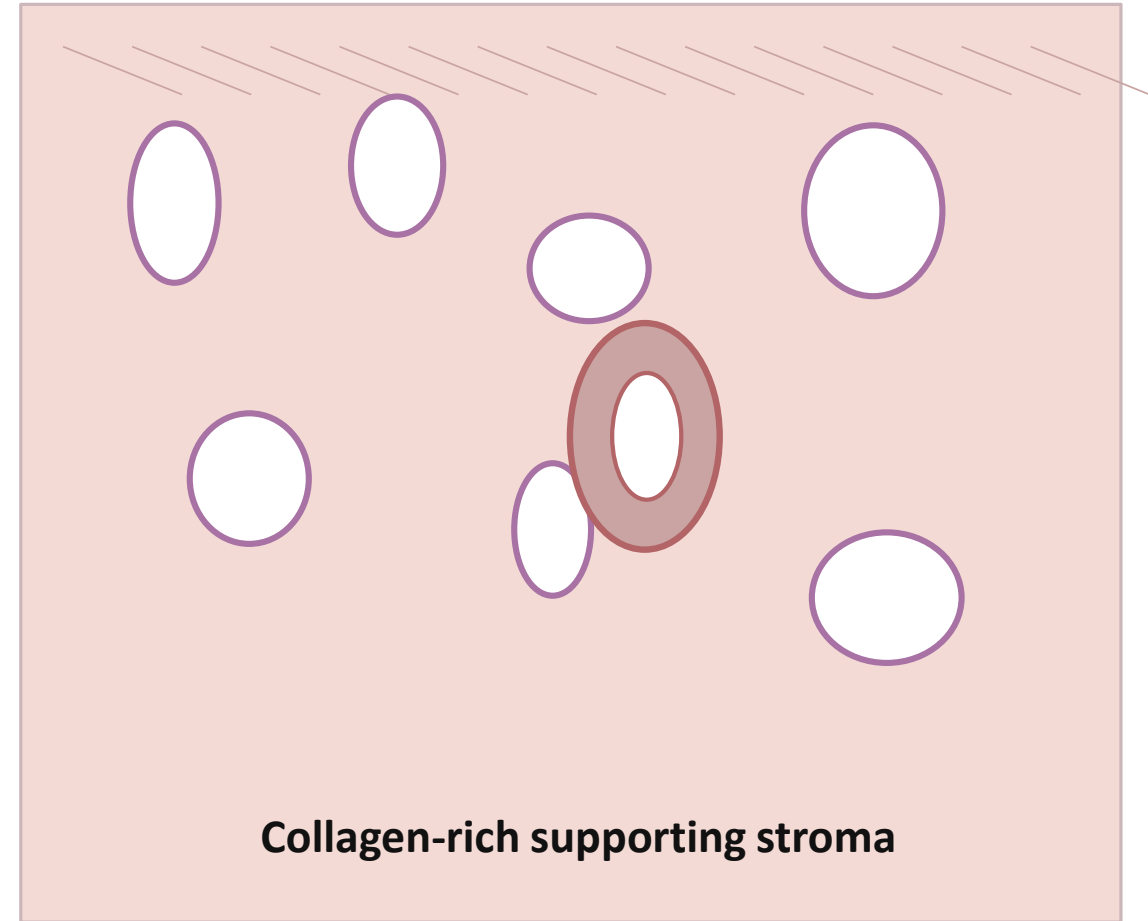
- Prominent thick-walled vessels are a useful polyp-associated morphologic clue.
- Look for them within the polyp stroma.
- A single vessel is supportive, not proof by itself.



Schematic · not a histologic specimen

Collagenous stroma is a key distinguishing clue

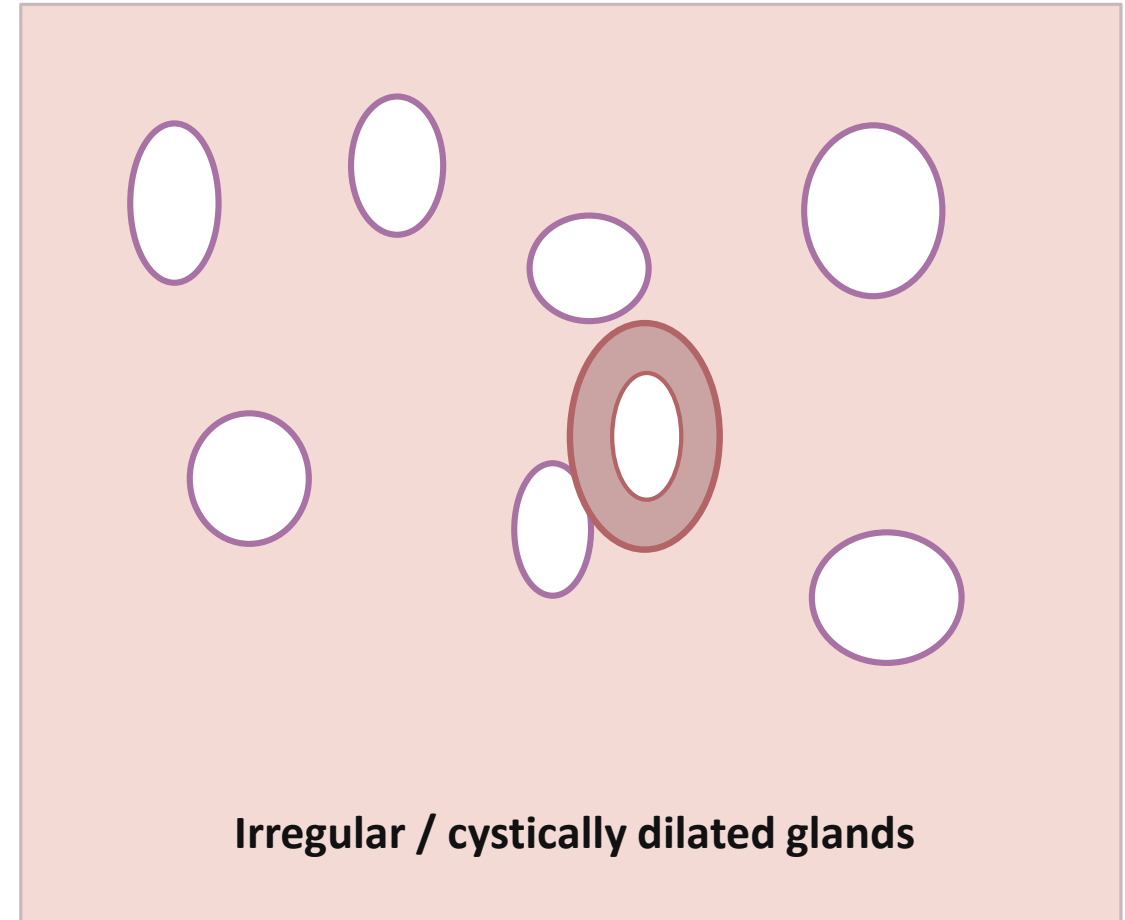
- Endometrial polyp stroma is often more collagenous than ordinary cycling endometrial stroma.
- Evaluate stroma alongside vessels and surface configuration.
- Distinguish this from myometrial smooth-muscle fascicles.



Schematic · not a histologic specimen

Glands can vary within benign polyps

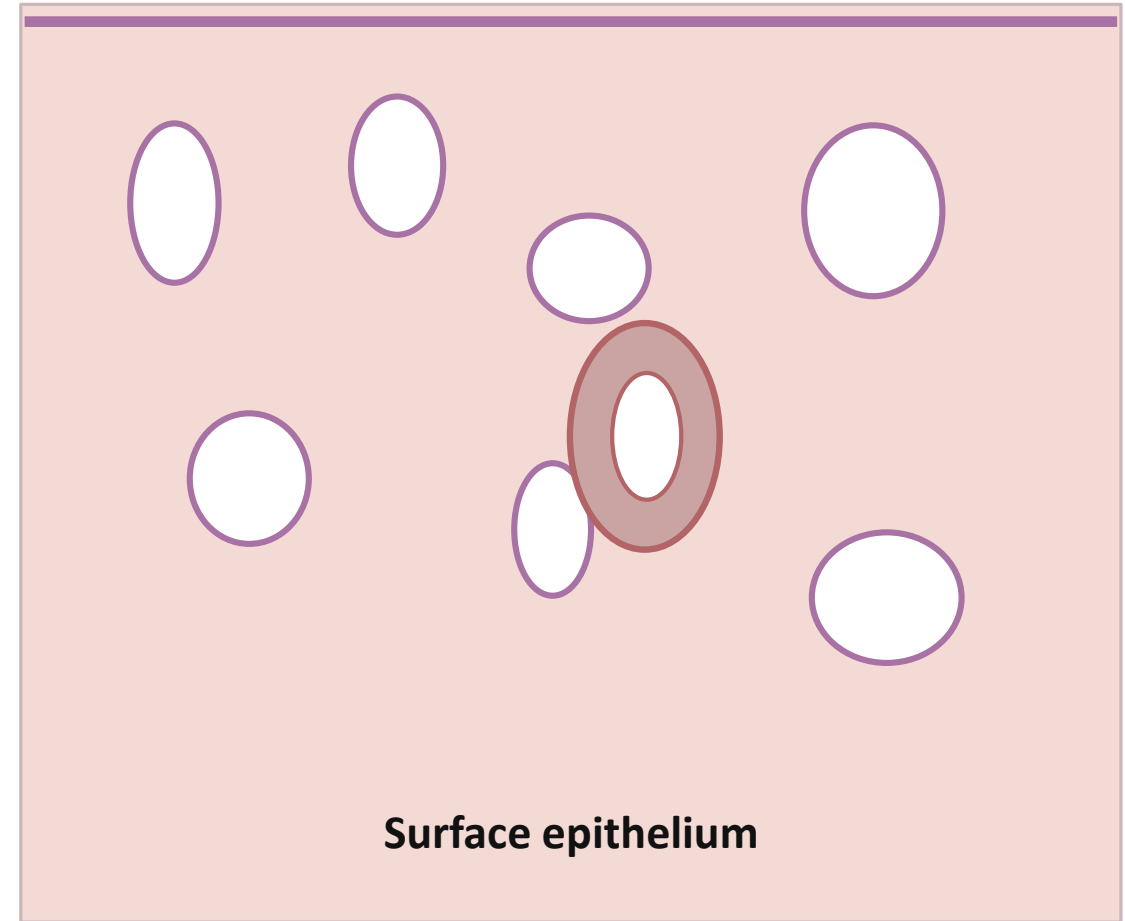
- Benign polyp glands may be irregularly spaced or cystically dilated.
- Their epithelial lining may remain cytologically bland.
- Gland shape alone must not be equated with endometrial carcinoma.



Schematic · not a histologic specimen

The surface configuration aids histologic recognition

- Epithelium on multiple sides of a tissue fragment supports a polypoid structure.
- Orientation and fragmentation can obscure this feature.
- Combine surface architecture with stromal and vascular clues.



Schematic · not a histologic specimen

Read morphology as a composite pattern

- Exophytic architectural context, where available.
- Collagenous stroma and thick-walled vessels.
- Endometrial glands with assessment of cytology and crowding.

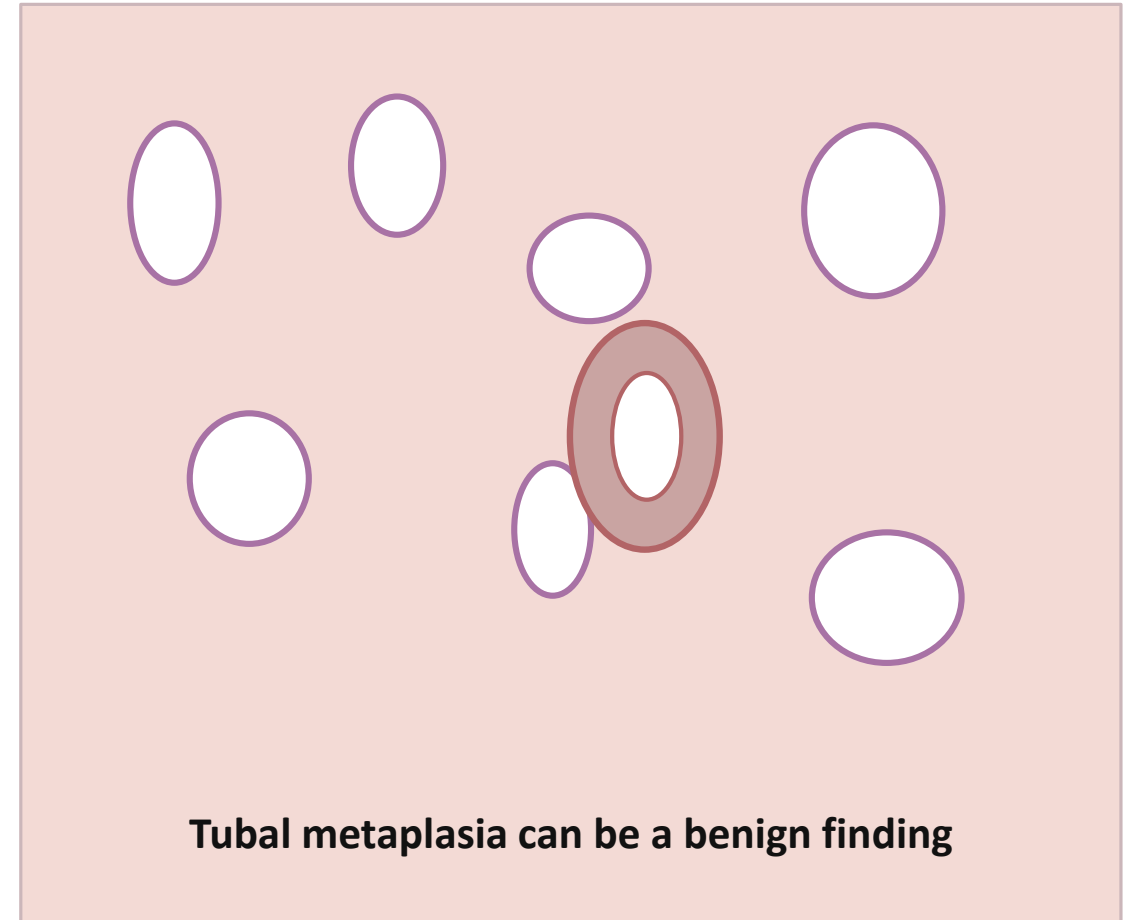
Endometrial glands

Fibrous stroma

Thick vessels

Tissue sections may contain incidental epithelial change

- Tubal metaplasia can be seen in an otherwise benign endometrial polyp.
- Metaplasia does not by itself establish malignancy.
- Evaluate epithelial atypia and architecture independently.



Schematic · not a histologic specimen

What is not established by a schematic?

- Illustrations explain gland–stroma–vessel relationships, not measured tissue appearances.
- A real H&E section is needed to assess cytology, mitoses, and diagnostic detail.
- A linked CC0 authentic micrograph is listed in the presenter notes for teaching comparison.

**Evaluate atypia and carcinoma,
not only polyp architecture**

Cytogenetics points toward the stroma

- Acquired chromosomal rearrangements occur in stromal cells of endometrial polyps.
- The reported changes resemble those of some other benign mesenchymal tumors.
- This supports a stromal neoplasm interpretation.

Acquired stromal change

Starting observation



Stromal tumor biology

Intermediate step



Focal polyp formation

Interpretation / action

Acquired changes are not germline traits

Acquired lesion change

Occurs in somatic lesional cells

Supports local neoplastic biology

No specific rearrangement given here

Inherited predisposition

Constitutional variant

Requires separate hereditary evidence

No germline testing recommendation implied

Why the term “stromal neoplasm” matters

- A polyp is not merely a displaced fold of otherwise normal endometrium.
- Stromal abnormalities explain why focal growth may persist.
- Neoplasm does not mean carcinoma; Most polyps are benign.

**STROMAL ORIGIN ≠
MALIGNANCY**

Do not confuse stromal origin with epithelial risk

Lesion biology

Stromal chromosomal rearrangements

Benign mesenchymal analogy

Not a statement of cancer risk

Clinical safety check

Inspect epithelial glands and lining

Exclude atypia/carcinoma if present

Do not ignore the background endometrium

Normal endometrium responds to two major hormones

- Estrogen promotes proliferation in glands and stroma.
- Progesterone suppresses estrogen-driven growth and causes secretory differentiation.
- Polyps differ from background endometrium in their response pattern.

Estrogen

Starting observation



Progesterone

Intermediate step



Cycle-dependent changes

Interpretation / action

Endometrial polyps respond to estrogen

- Polyps are estrogen responsive.
- This is consistent with their endometrial hormonal environment.
- Do not infer a quantitative estrogen threshold from this description.

Estrogen signal

Response retained in polyp



Localized polyp tissue

Growth responsiveness

Qualitative response · no quantitative threshold implied

Polyps respond little, if at all, to progesterone

- Unlike ordinary secretory endometrium, polyp tissue shows little or no progesterone response.
- The mismatch helps contextualize polyp persistence during normal cycles.
- Responsiveness is a biologic observation, not a treatment algorithm.

Progesterone signal

Little / no polyp response



Localized polyp tissue

Secretory differentiation is limited

Qualitative response · no quantitative threshold implied

Polyp versus background: A hormonal mismatch

Background lining	Polyp
Cyclic gland/stromal change	Focal persistent growth
Estrogenic proliferation	Estrogen responsiveness
Strong secretory progesterone effects	Little or no progesterone response

Tamoxifen acts differently by tissue

- Tamoxifen is used for its antiestrogenic effects in breast tissue.
- In endometrium, weak proestrogenic activity.
- This tissue-selective pattern explains the association with endometrial polyps.

Breast tissue

Antiestrogenic effect

Endometrium

Weak proestrogenic effect

Tamoxifen exposure is a clinical clue

- Endometrial polyps may occur during tamoxifen administration.
- Medication history is therefore relevant when interpreting an intracavitary lesion.
- Association should not be presented as a deterministic individual risk estimate.

**Medication history + cavity
lesion**

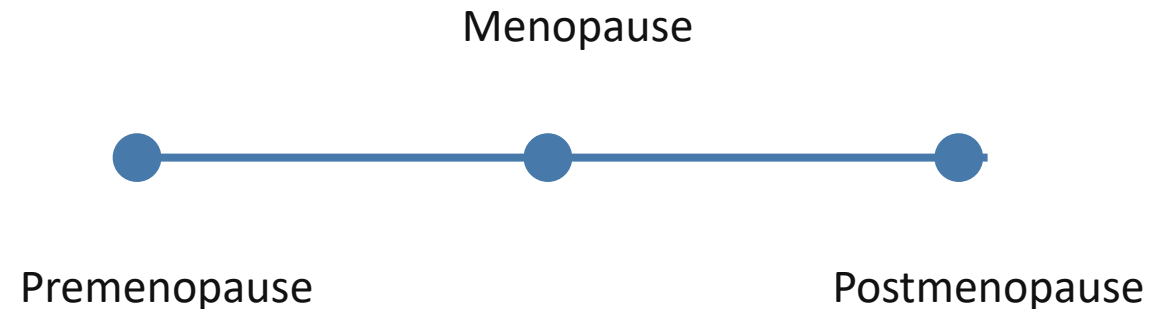
Do not assume every tamoxifen-associated lesion is benign

- A polyp may coexist with epithelial abnormalities.
- Clinical context and tissue assessment remain important.
- Robbins documents rare adenocarcinoma arising within a polyp.

**Evaluate atypia and carcinoma,
not only polyp architecture**

Atrophic polyps occur after menopause

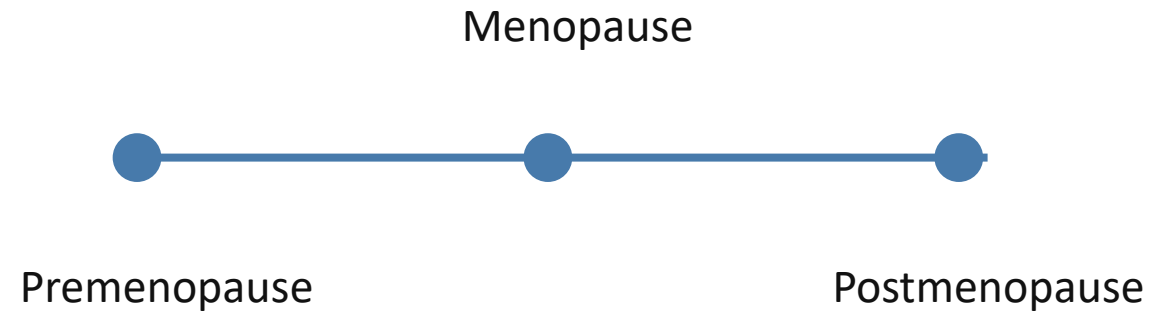
- Atrophic polyps chiefly occur in postmenopausal patients.
- Robbins interprets them as likely residual lesions formed before menopause.
- Atrophy refers to tissue state, not guaranteed clinical harmlessness.



Atrophic polyp may persist

Atrophy and persistence can coexist

- A pre-existing localized polyp can remain after normal ovarian cyclic activity declines.
- Its glands may show atrophic rather than proliferative features.
- The patient's life stage affects morphology and clinical interpretation.



Atrophic polyp may persist

Clinical presentation spans a wide range

- Some patients have no symptoms.
- Others present with abnormal uterine bleeding.
- Infertility may also be associated with polyps.

Asymptomatic

Incidental finding

Bleeding

Presenting symptom

Infertility

Possible association

Bleeding is a symptom, not a histologic diagnosis

- Polyps can cause abnormal bleeding.
- Anovulatory endometrium, inflammation, leiomyomas, and neoplasia can also cause bleeding.
- A focal finding must be interpreted with clinical and endometrial context.

Structural

Polyp · leiomyoma · neoplasia · inflammation

Functional

Anovulatory / endocrine disturbance

Simplified differential categories · not exhaustive

Infertility may be part of the presentation

- Infertility as a possible manifestation.
- The presence of a polyp does not prove it is the sole cause of infertility.
- A clinicopathologic conclusion should acknowledge alternative explanations.

Focal tissue finding + clinical context

An asymptomatic polyp may be discovered incidentally

- Absence of bleeding does not exclude a polyp.
- Anatomic detection and symptom burden are separate dimensions.
- Reporting should still characterize the tissue and assess concerning features.

ASYMPTOMATIC ≠ ABSENT

Carcinoma may rarely arise within a polyp

- Robbins explicitly identifies adenocarcinoma arising in endometrial polyps as rare.
- The primary concern is an epithelial malignant focus, not a generalized claim that all polyps progress.
- Carefully inspect lesions for atypical epithelial architecture or cytology.

**Evaluate atypia and carcinoma,
not only polyp architecture**

Histology must check beyond the benign polyp pattern

- Confirm polyp-associated stromal, vascular, and epithelial features.
- Survey for atypia, architecturally concerning glands, or carcinoma.
- Review the background endometrium when available.

Endometrial glands

Fibrous stroma

Thick vessels

Composite morphologic assessment

Polyp versus submucosal leiomyoma

Endometrial polyp

Endometrial origin

Glands + stroma

Variable stalk/broad attachment

Submucosal leiomyoma

Myometrial smooth muscle

Interlacing smooth muscle fascicles

Can protrude beneath endometrium

Polyp versus endometrial hyperplasia

Polyp

Focal mass

Stromal and vascular clues

Inspect lesion and lining

Hyperplasia

Increased gland-to-stroma ratio

Architectural gland crowding

Assess cytologic atypia

Polyp versus anovulatory bleeding

Polyp

Localized projection

Stromal neoplastic interpretation

May coexist with hormonal abnormalities

Anovulatory endometrium

Often diffuse hormonal pattern

Failure of ovulation

Stromal breakdown with proliferative glands

Polyp versus chronic endometritis

Polyp

Focal endometrial mass

Thick vessels + collagenous stroma

May cause bleeding/infertility

Chronic endometritis

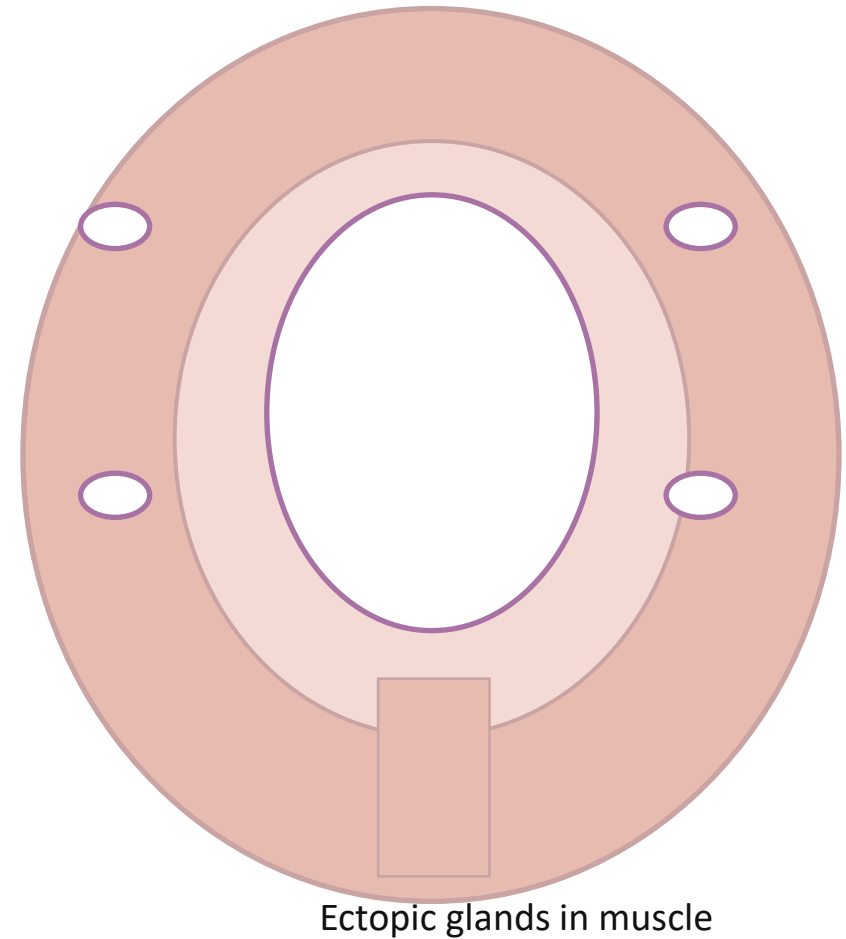
Inflammatory endometrium

Stromal plasma cells

May cause bleeding/infertility

Polyp versus adenomyosis

- A polyp projects into the cavity.
- Adenomyosis consists of endometrial tissue within the myometrium.
- Their abnormal endometrial tissue is located in different compartments.



Diagnostic reasoning starts with focality

- Question 1: Is there a discrete intracavitary lesion?
- Question 2: Is the tissue endometrial gland-and-stroma or smooth muscle?
- Question 3: Is epithelial atypia or carcinoma present?

Focal lesion?

Starting observation



Tissue identity?

Intermediate step



Epithelial safety check

Interpretation / action

Hysteroscopy directly evaluates the cavity

- ACOG describes hysteroscopy for diagnosis and treatment of intrauterine pathology.
- It allows visual assessment of a suspected focal lesion.
- The procedural context is supplementary clinical guidance, distinct histopathology.

Cavity visualization

Starting observation



Targeted tissue removal

Intermediate step



Histopathologic examination

Interpretation / action

Targeted polypectomy supports definitive tissue review

- ACOG favors direct hysteroscopic polyp removal over blind methods when removal is indicated.
- A resected specimen can be evaluated for benign polyp features and focal malignancy.
- Procedural choice remains individualized to clinical circumstances.

Identify lesion

Starting observation



Remove under visualization

Intermediate step



Review tissue

Interpretation / action

Reasons for removal depend on clinical context

- ACOG lists abnormal bleeding, infertility, and recurrent pregnancy loss among indications for polyp removal.
- Expectant or surgical management depends on symptoms and malignancy risk factors.
- No universal management rule follows from polyp size alone in these sources.

Bleeding

Abnormal uterine bleeding

Infertility

Relevant to fertility care

Pregnancy loss

Recurrent pregnancy loss

Blind sampling has a focal-lesion limitation

- ACOG notes that blind removal or curettage can inaccurately detect or incompletely remove an intracavitary lesion.
- Direct visualization can improve target localization.
- Histologic sampling must still evaluate any concerning tissue.

Focal tissue finding + clinical context

A pathology report should answer clinical questions

- Identify the lesion as an endometrial polyp when supported by morphology.
- State whether atypia or malignancy is present.
- Document any separate relevant background endometrial abnormality represented in the sample.

Case 1 · Bleeding with a focal cavity mass

- A premenopausal patient has abnormal uterine bleeding.
- A focal lesion projects into the endometrial cavity.
- What distinguishes a polyp from an anovulatory endometrial pattern?

Discussion prompt · explanation in presenter notes

Case 2 · A patient receiving tamoxifen

- A patient with prior breast cancer treatment is taking tamoxifen.
- An endometrial cavity projection is detected.
- What tissue-specific drug effect helps explain this association?

Discussion prompt · explanation in presenter notes

Case 3 · A postmenopausal polyp

- A patient after menopause has a small endometrial polyp with atrophic glands.
- Which polyp subtype is compatible with this finding?
- Does atrophy eliminate the need to assess epithelial abnormalities?

Discussion prompt · explanation in presenter notes

Case 4 · A crowded glandular focus

- A polyp contains areas of irregular and crowded glands.
- What two different diagnoses must not be conflated?
- What additional features must be assessed?

Discussion prompt · explanation in presenter notes

Integrated interpretation: Four linked levels

- Anatomic: Localized projection into the endometrial cavity.
- Biologic: Acquired stromal rearrangements; Estrogen responsiveness with little progesterone effect.
- Histologic: Integrate glandular, stromal, vascular, and epithelial findings.
- Clinical: Correlate with bleeding, fertility, tamoxifen, menopausal state, and rare cancer.

Six high-yield pathology statements

- A polyp is a focal exophytic endometrial mass.
- Most are small and sessile, but pedunculated and multiple lesions occur.
- Stromal acquired rearrangements support a benign neoplastic process.
- Estrogen responsiveness contrasts with weak progesterone responsiveness.
- Bleeding, infertility, and asymptomatic detection are all possible.
- Rare carcinoma requires diligent histologic examination.

Selected sources

- Robbins, Cotran & Kumar. Pathologic Basis of Disease, 11th ed. (2026), chapter 22, pp. 910–915.
- Patholines. Endometrial polyp (M. Häggström): supplemental histologic recognition and reporting.
- ACOG Committee Opinion No. 800 (2020): hysteroscopic diagnosis and removal.
- Wikimedia Commons (M. Häggström, CC0): linked authentic H&E references in notes; not reproduced.