

Fibromas and Thecomas

Ovarian sex cord–stromal tumors • morphology, clinical correlations,
differential diagnosis

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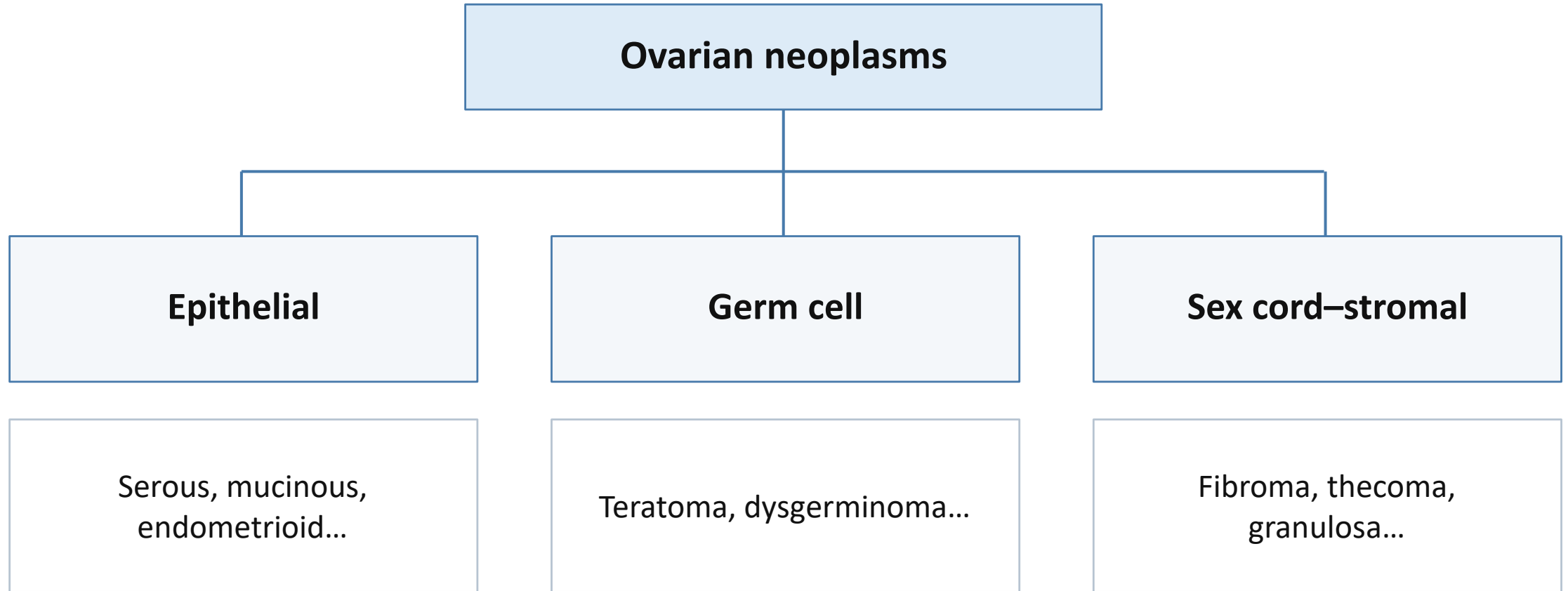
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Learning outcomes

- Place fibromas and thecomas within ovarian sex cord–stromal neoplasia.
- Recognize characteristic gross and microscopic patterns.
- Explain endocrine activity, Meigs syndrome, and Gorlin syndrome association.
- Apply morphology and selected ancillary tests to common diagnostic differentials.

Ovarian tumor categories: Where do these fit?



Schematic classification hierarchy

Stromal and sex-cord differentiation



Schematic — not a specimen

- The pathologic phenotype resembles a normal gonadal cell type.
- Morphology and endocrine function reflect predominant differentiation.

A spectrum of ovarian stromal tumors

Fibroma

Fibrothecoma

Thecoma

Fibroblastic cells
predominate

Mixed fibroblastic + thecal
features

Lipid-containing theca-like
cells predominate

Conceptual comparison — three linked properties

Fibroma and thecoma are related—not identical

Fibroma

- Well-differentiated fibroblasts
- Firm, gray-white tumor
- Generally hormonally inactive

Thecoma

- Plump theca-like spindle cells
- Intracytoplasmic lipid
- May produce steroid hormones

Frequency: A meaningful ovarian tumor subgroup

~4%

Of all ovarian tumors (fibromas and thecomas together)

- The prevalence is not a malignancy probability.
- Thecomas are less common than fibromas.
- Use pathology and clinical features, not frequency alone.

Benign behavior predominates

- Most ovarian fibromas and thecomas are benign.
- Tumors composed predominantly of theca cells are almost never malignant (Robbins).
- Atypia, cellularity, and mitoses require careful interpretation—not an automatic malignant designation.

The usual clinical entry point: Pelvic mass



Schematic — not a specimen

- Pain and abdominal distension may prompt assessment.
- No single symptom identifies a fibroma or thecoma.

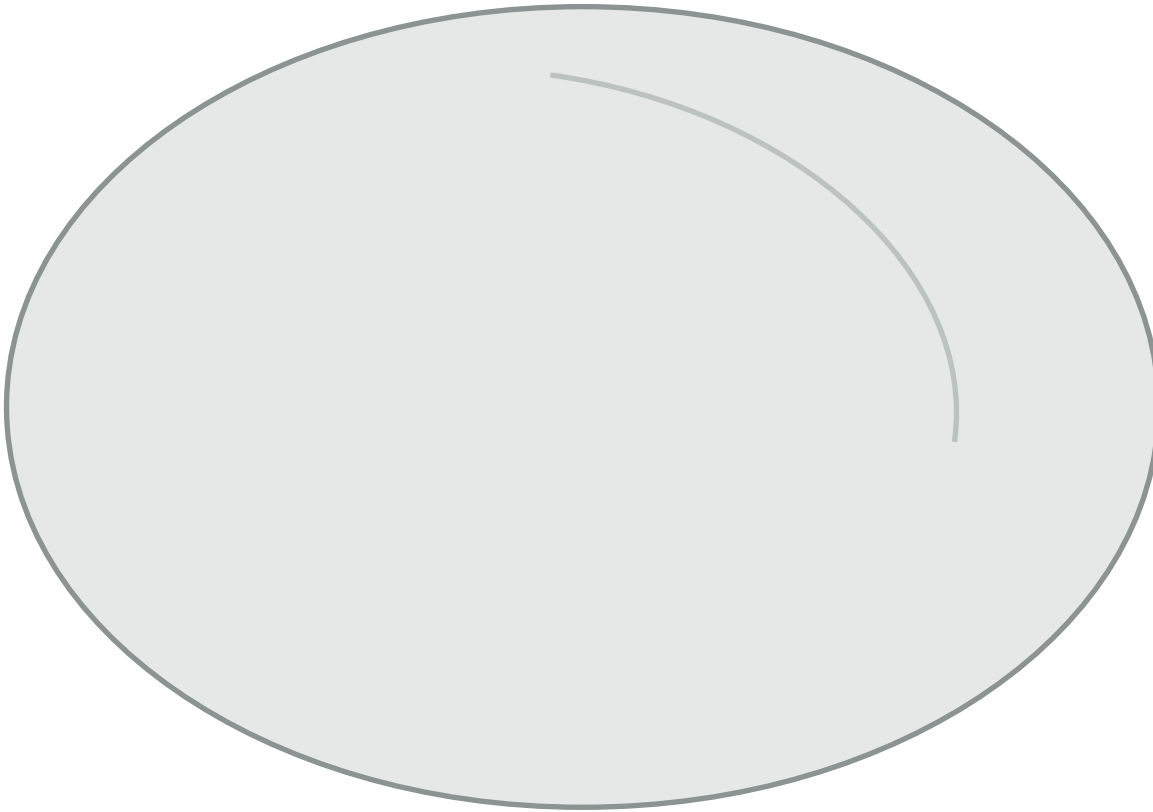
Laterality is a useful clue

~90%

Of ovarian fibromas are unilateral
(Robbins)

- Unilateral presentation is expected but not obligatory.
- A bilateral or multifocal pattern should prompt careful contextual assessment.
- Laterality alone does not establish histologic type.

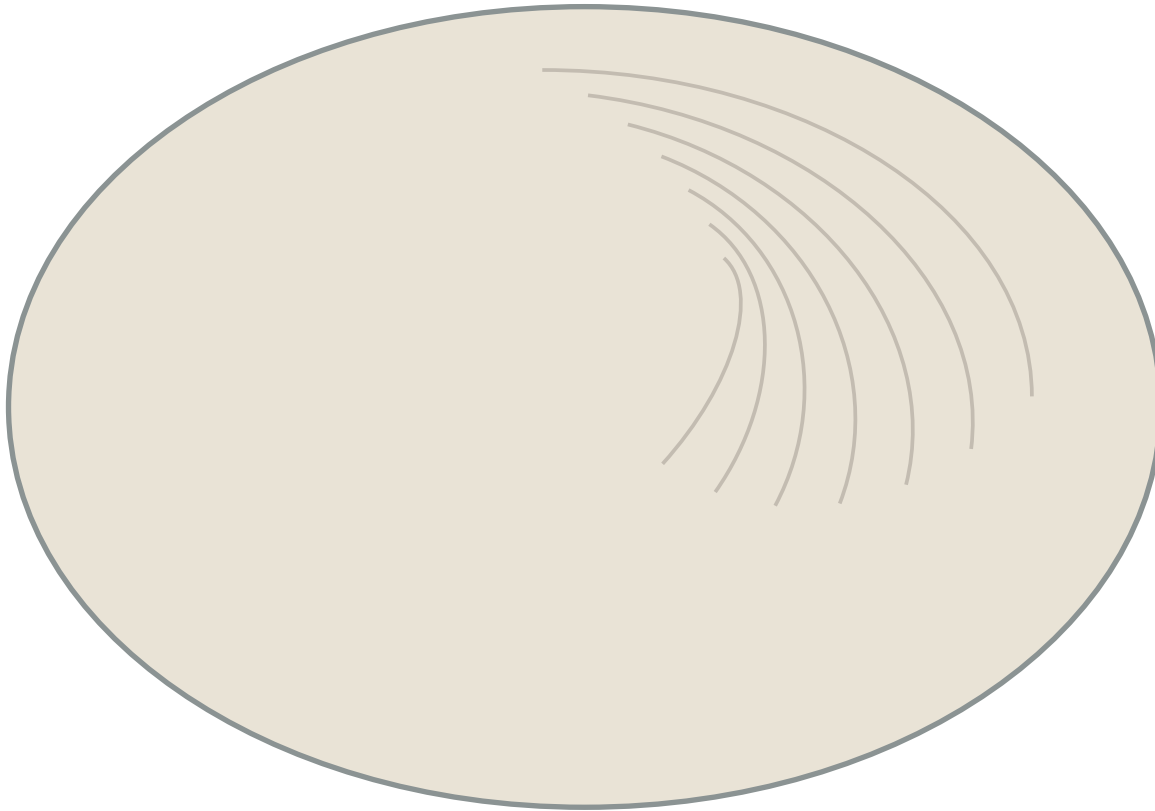
Fibroma: External gross appearance



Gross morphology schematic

- Solid and spherical or slightly lobulated
- Usually encapsulated and hard
- Smooth, glistening, intact ovarian serosal surface

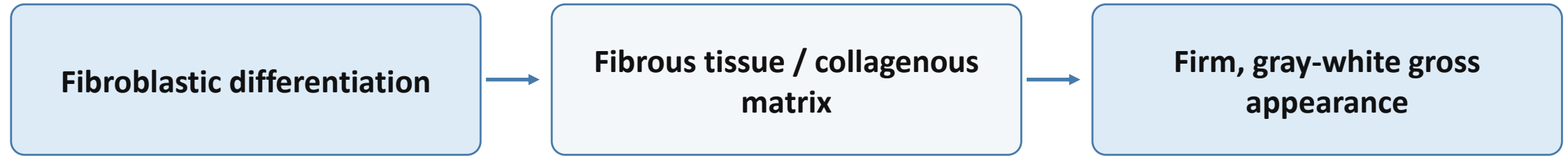
Fibroma: Cut surface



Gross morphology schematic

- Typically gray-white
- Firm, fibrous character
- Macroscopic appearance helps direct histologic sampling

Why is the tumor firm and pale?



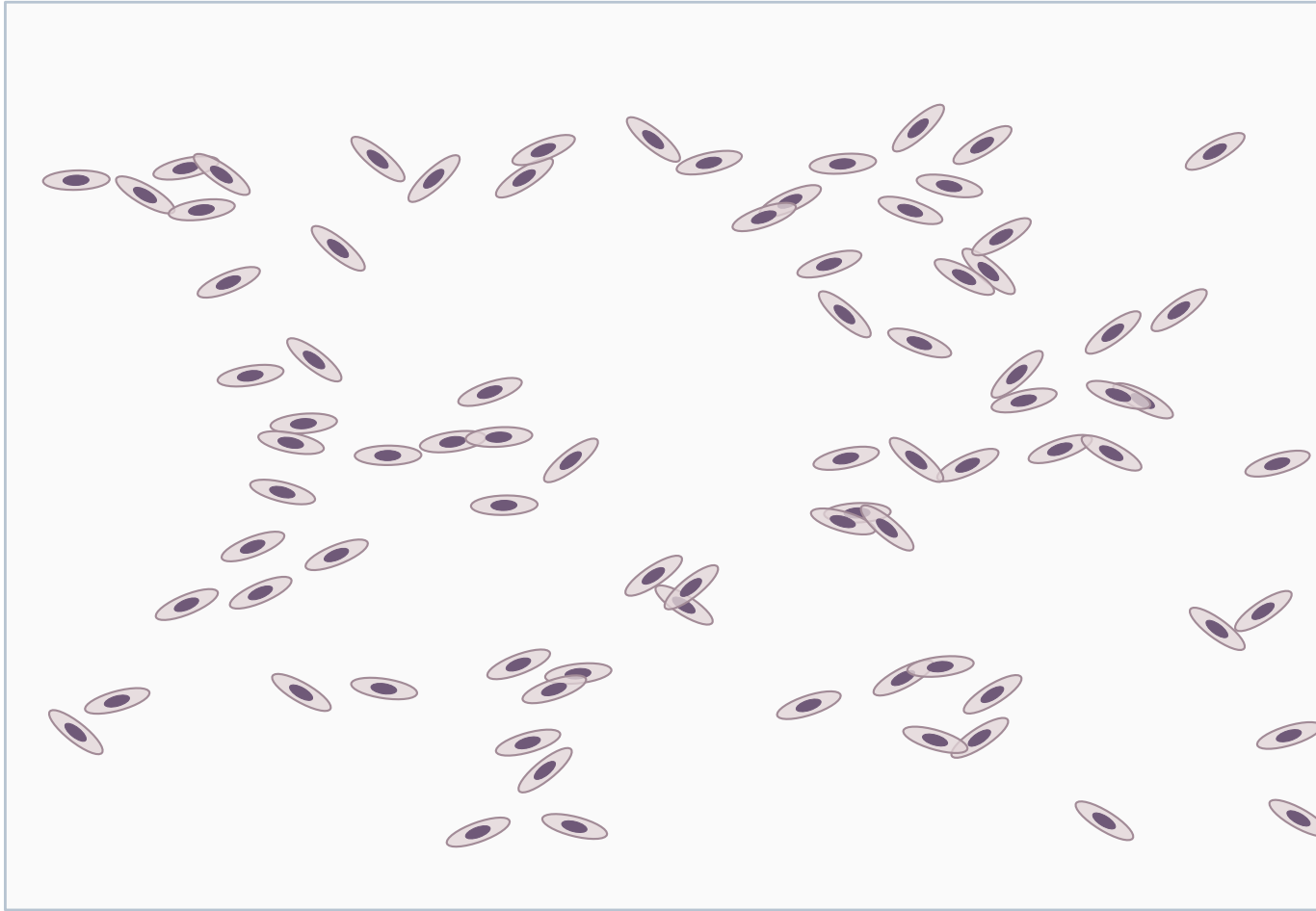
Schematic — not a specimen

- This is a morphologic correlation, not proof of subtype.
- Thecoma-rich areas may be more lipid-rich or yellow-tan.

Gross morphology: Diagnostic description

- Document whether the lesion is solid, circumscribed, and unilateral.
- Describe the cut-surface color, texture, hemorrhage, or degeneration if present.
- Identify attached tube and residual ovarian tissue, if available.
- Target unusual regions for additional sections.

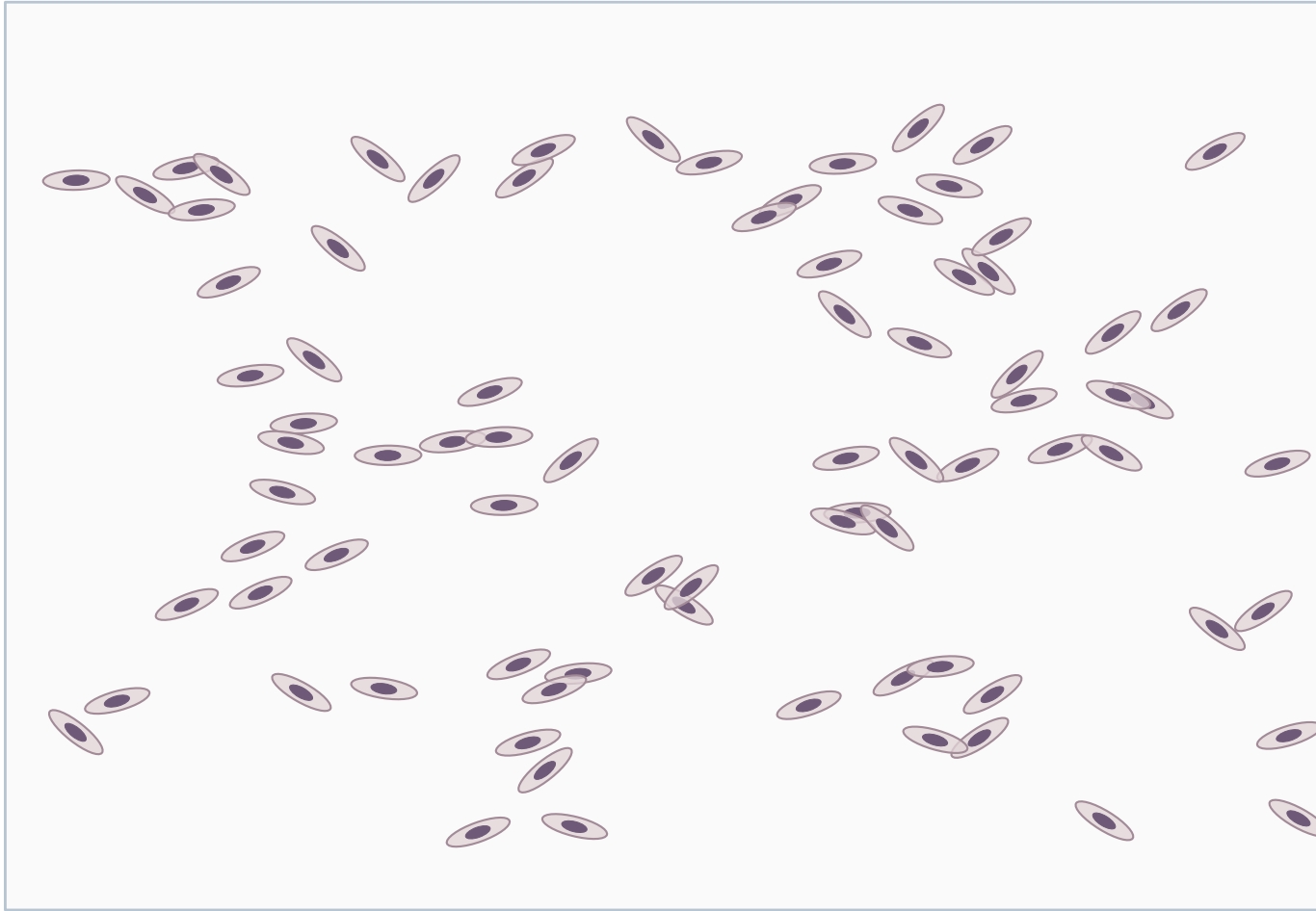
Fibroma on H&E: The constituent cells



Simplified stromal-cell diagram — NOT histology

- Uniform spindle-shaped fibroblastic cells
- Bland elongated or ovoid nuclei
- Fibrous background, with generally little atypia

Fibroma: An architectural reading



Simplified stromal-cell diagram — NOT histology

- Interlacing spindle-cell fascicles / diffuse growth
- Cellularity varies across lesions
- Interpret distribution, cytology, and matrix together

Collagen and cellularity are distinct axes

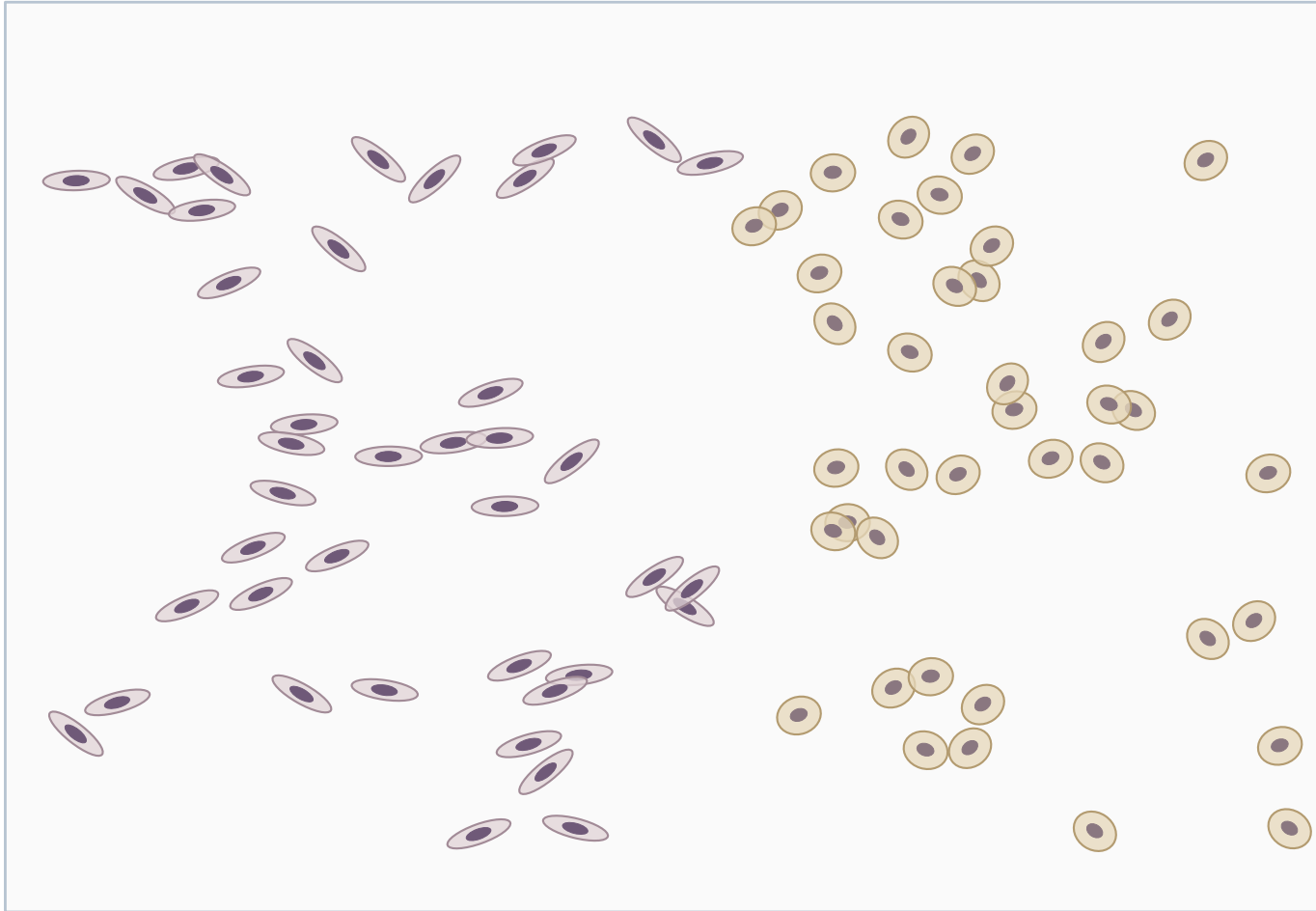
Cell-poor / fibrous

- Prominent stromal matrix
- More conspicuous collagen
- Lower apparent nuclear density

More cellular

- Closer-spaced tumor cells
- Fibrous matrix less prominent
- Still may represent a benign tumor

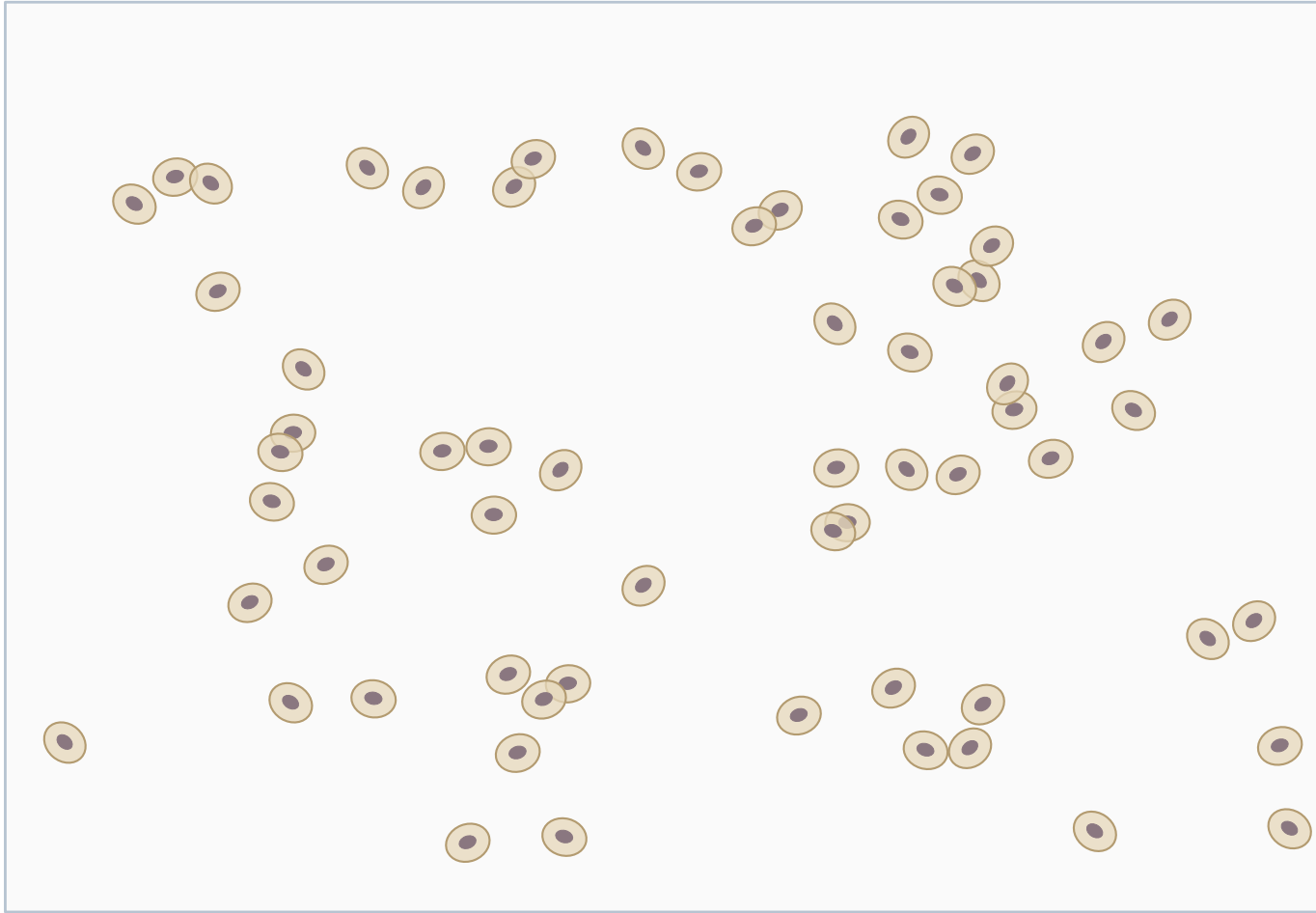
Focal thecal differentiation in a fibroma



Simplified stromal-cell diagram — NOT histology

- Plumper cells may appear focally
- Lipid-rich cytoplasm suggests thecal differentiation
- Small focal thecal component does not negate fibroma phenotype

Thecoma on H&E: A plumper cell population



Simplified stromal-cell diagram — NOT histology

- Plump, round-to-spindle stromal cells
- Pale or vacuolated cytoplasm in lipid-containing cells
- Less overtly fibrous appearance than classic fibroma

Cytoplasmic lipid has functional relevance



Schematic — not a specimen

- Lipid morphology supports—but does not prove—hormone secretion.
- Pure thecomas are more often functional than fibromas.

Fibrothecoma: Overlapping morphologies

Fibroblastic component

- Spindle-cell morphology
- Fibrous matrix
- Typically little endocrine activity

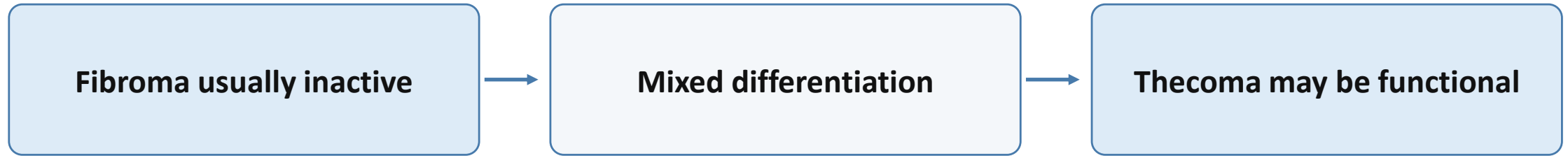
Thecal component

- Plump, pale cells
- Lipid-rich cytoplasm
- Potential steroid production

Contrast: Gross and microscopic clues

Feature	Fibroma	Thecoma
Typical cut surface	Firm / white–gray	Often more yellow-tan
Predominant cells	Bland fibroblasts	Plump theca-like cells
Cytoplasmic lipid	Limited / focal	More conspicuous
Hormonal activity	Generally absent	May be present

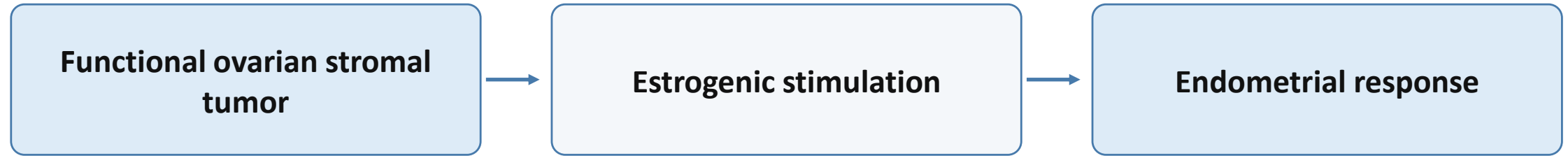
Functional status: A spectrum, not a binary label



Schematic — not a specimen

- Do not infer estrogen production from the word “thecoma” alone.
- Assess endocrine symptoms and endometrium when clinically indicated.

Estrogenic activity: Tissue consequences



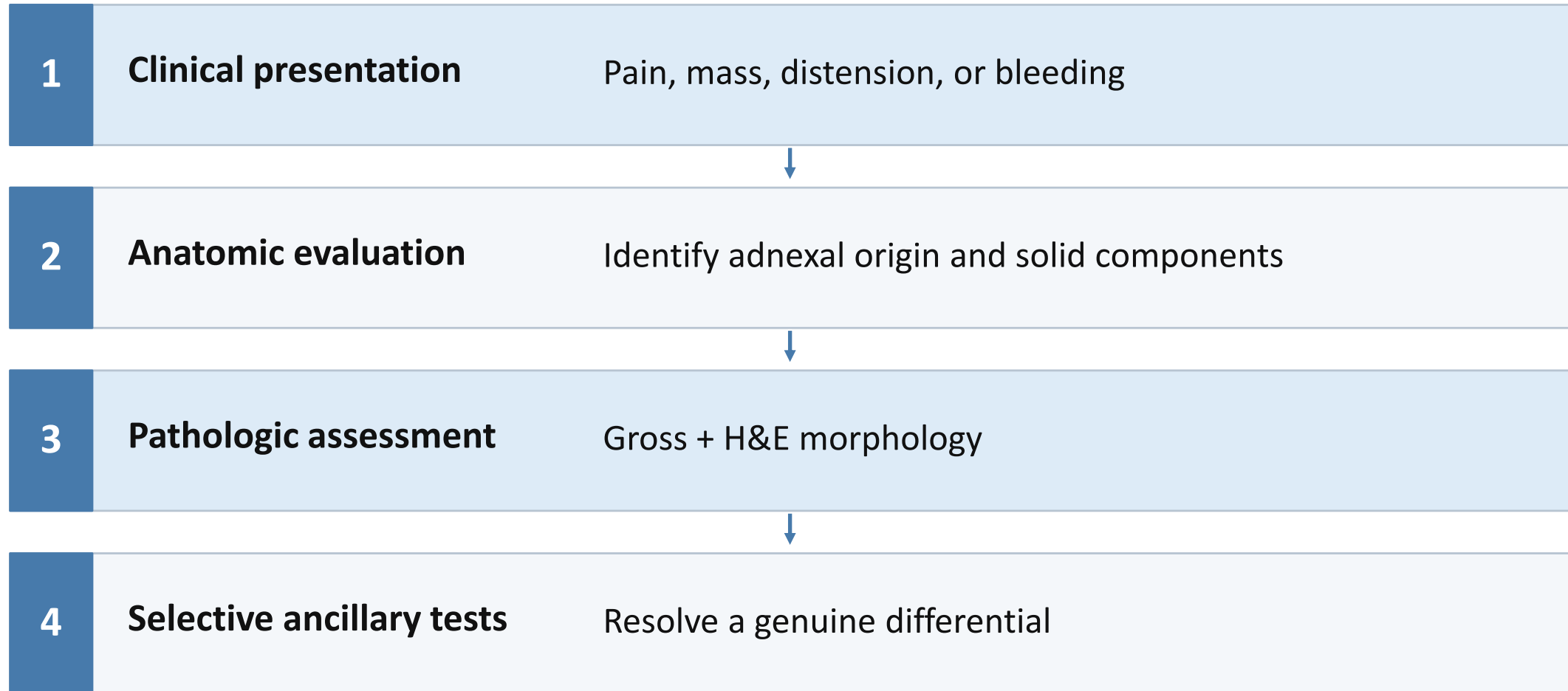
Schematic — not a specimen

- Abnormal uterine bleeding can be a clinical clue.
- Endometrial sampling is driven by symptoms, age, and clinical judgment.

Bleeding is a clinical clue, not a subtype label

- A patient with a solid adnexal mass may report abnormal uterine bleeding.
- A hormonally active thecoma is one possible contributor.
- Other gynecologic causes remain common; Evaluate independently.
- Neither bleeding nor estrogen effects establish the diagnosis without tissue.

Diagnostic pathway for a suspected stromal mass



Ascites can complicate an otherwise benign tumor

~40%

Ascites among fibromas >6 cm

- This is a size-selected group; Do not generalize to all fibromas.
- Fluid plus an adnexal tumor is not equivalent to carcinoma.
- Pleural effusion occurs less commonly.

Meigs syndrome: The defining triad

Ovarian tumor

Ascites

Pleural effusion

Classically a fibroma

Peritoneal fluid

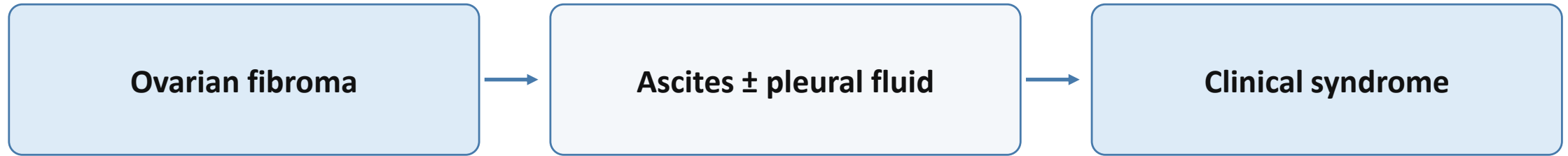
Often right-sided when
present

Conceptual comparison — three linked properties

Meigs syndrome: The pleural component

- Pleural effusion is an uncommon additional feature of ovarian fibroma with ascites.
- A frequent right-sided location.
- Pleural fluid alone cannot prove ovarian tumor malignancy.
- The mechanism of the syndrome is not established.

The mechanism of Meigs syndrome is uncertain



Schematic — not a specimen

- Association is established; A single causal pathway is not.
- Avoid drawing a speculative lymphatic or vascular mechanism as proven.

Ascites creates a diagnostic paradox

Initial concern

- Solid adnexal mass
- Abdominopelvic fluid
- Possible pleural effusion

Pathologic resolution

- May suggest advanced cancer
- May instead accompany benign fibroma
- Histologic confirmation remains essential

Clinical interpretation of the fluid triad

1

Mass with fluid

Do not assign stage from fluid alone



2

**Clinical and imaging
assessment**

Evaluate malignancy on its merits



3

Tissue diagnosis

Identify the actual ovarian lesion



4

Follow-up

Correlate pathology with clinical course

Nevoid basal cell carcinoma syndrome association

- Ovarian fibroma is one recognized tumor association of Gorlin syndrome.
- The syndrome also involves multiple basal cell carcinomas and odontogenic keratocysts.
- An unusual familial or multifocal presentation may raise clinical suspicion.
- The association does not make every isolated fibroma hereditary.

Gorlin syndrome: Mechanistic context



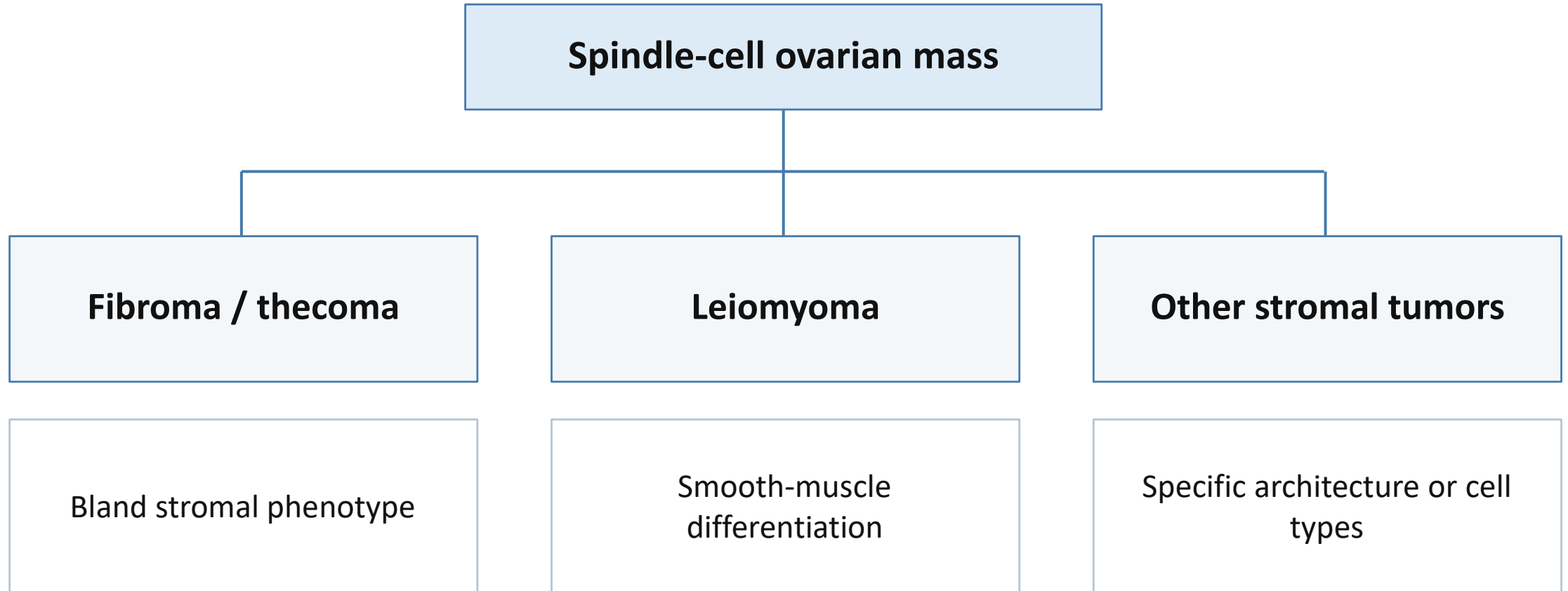
Schematic — not a specimen

- PTCH as a tumor-suppressor gene.
- Association should trigger clinical pattern recognition, not universal germline testing.

When to consider a syndromic context

Finding	Interpretive significance
Young patient / multifocal ovarian lesions	Assess broader clinical history
Multiple basal cell carcinomas	Gorlin syndrome clue
Odontogenic keratocysts	Additional syndrome clue
Isolated unilateral fibroma	Syndrome cannot be inferred

Solid spindle-cell ovarian lesions: Differential



Schematic classification hierarchy

Fibroma versus ovarian leiomyoma

Fibroma

- Ovarian fibroblastic stromal tumor
- Bland spindle cells + fibrous matrix
- Sex cord–stromal context

Leiomyoma

- Smooth-muscle tumor
- Intersecting eosinophilic fascicles may be prominent
- Muscle marker panel may support distinction

Fibroma versus granulosa cell tumor

Fibroma

- Predominantly fibroblastic cells
- Fibrous stroma
- Usually benign

Granulosa tumor

- Follicular / sex-cord differentiation
- Nuclear grooves or Call–Exner bodies may occur
- Potentially malignant behavior

Thecoma versus granulosa–theca tumor

Predominant thecal cells

- Lipid-rich plump cells
- Often endocrine phenotype
- Pure thecoma almost always benign

Granulosa component present

- Look for follicular-cell architecture
- Adult granulosa tumors may be FOXL2-mutated
- Behavior differs from a pure thecoma

Sclerosing stromal tumor as a mimic

- Consider when vascular, pseudolobular, or heterogeneous stromal patterns predominate.
- A focal vascular area does not by itself reclassify a fibroma.
- Seek the global growth pattern and characteristic cell populations.
- Use ancillary studies only if routine morphology leaves genuine ambiguity.

Atypical areas: Avoid automatic overclassification

- Degeneration, sclerosis, calcification, and focal increased cellularity may occur.
- Isolated mitoses do not by themselves establish an aggressive stromal malignancy.
- Interpret cytologic atypia and proliferation in context.
- Defer precise malignant classification until adequate sampling and review.

Cellular fibroma: A diagnostic problem

Typical fibroma

- Low to moderate cellularity
- Bland fibroblastic morphology
- Usually little proliferative activity

Cellular fibroma pattern

- Higher cell density
- May show mitotic activity
- Needs assessment for severe atypia / necrosis

Fibrosarcoma is not defined by size alone

- A highly atypical, proliferative malignant spindle-cell process raises a different differential.
- Do not apply an unverified mitotic threshold to label fibrosarcoma.
- Necrosis, destructive features, and cytology require integrated interpretation.
- Expert review may be appropriate in equivocal cases.

Reticulin: An architectural adjunct



Schematic — not a specimen

- Reticulin can help characterize stromal patterns and highlight nested sex-cord elements.
- A reticulin stain is not a stand-alone classifier.

Immunophenotype: Purpose and limits

- Inhibin and calretinin support sex cord–stromal differentiation in context.
- Fibromas may show absent, focal, or weaker staining than thecomas.
- Expression varies; A negative individual marker does not automatically exclude fibroma.
- Interpret phenotype together with the microscopic pattern.

A focused stain panel answers a question

Question	Potential approach	Caution
Stromal lineage?	Inhibin, calretinin $\pm$ others	Variable expression
Smooth muscle?	Desmin / SMA as indicated	Overlap exists
Epithelial lesion?	Cytokeratin / EMA as indicated	Use morphology first
Mixed sex-cord elements?	H&E $\pm$ reticulin	Cannot decide from one stain

Do not turn biomarkers into unsupported cutoffs

- Stain extent and intensity are interpreted with morphology.
- No single percentage of inhibin positivity defines fibroma versus thecoma here.
- Avoid assigning a FOXL2 mutation to a tumor based on FOXL2 protein expression.
- Tests should resolve a specific alternative diagnosis.

Molecular findings: The appropriate scope

- Fibroma/thecoma diagnosis is primarily morphologic.
- Molecular testing can help in selected difficult sex cord–stromal differentials.
- FOXL2 mutation is strongly associated with adult granulosa cell tumors, not a default fibroma test.
- Syndromic PTCH-pathway testing is a separate clinical genetics question.

Specimen sampling: Answer the highest-value questions

1

Map the tumor

Capsule, size, cut-surface heterogeneity



2

Sample representative tissue

Fibrous and atypical-looking regions



3

Microscopic integration

Cell shape, stroma, atypia, architecture



4

Classify cautiously

Correlate with clinical context

Pathology report: Core narrative elements

- State the tumor entity and ovarian location.
- Describe the dominant morphology and meaningful variant features.
- Note unusual atypia or proliferative findings if present.
- Avoid inferring endocrine secretion without a clinical basis.

Clinical behavior guides communication

Most benign

Function may vary

Fluid may mislead

Typical fibromas/thecomas

Assess hormone-related
symptoms

Meigs syndrome can mimic
malignancy

Conceptual comparison — three linked properties

Clinical vignette 1: Solid mass with effusions

Illustrative case • A patient has a unilateral solid ovarian mass, ascites, and a right pleural effusion. No histology is yet available.

- What named syndrome is suggested?
- Does this triad establish ovarian carcinoma?
- Which finding is needed for tumor classification?

Vignette 1: Reasoned interpretation

- The triad suggests Meigs syndrome in the appropriate setting.
- The findings are compatible with an ovarian fibroma but not pathognomonic.
- Clinical assessment still must exclude alternative etiologies.
- Tissue diagnosis determines the actual ovarian neoplasm.

Clinical vignette 2: Endocrine symptoms

Illustrative case • An adult with abnormal uterine bleeding has a solid ovarian lesion. Histology shows bland, plump stromal cells with pale cytoplasm.

- What stromal differentiation is suggested?
- Which clinical phenomenon could connect the mass and bleeding?
- What must not be inferred from cytoplasm alone?

Vignette 2: Pathologic interpretation

- Plump, pale theca-like cells favor thecoma differentiation.
- Steroidogenic activity may explain estrogenic manifestations.
- Lipid-containing cells do not prove clinically significant estrogen secretion.
- Evaluate other causes of abnormal bleeding independently.

Clinical vignette 3: Spindle-cell ambiguity

Illustrative case • A solid ovarian tumor contains bland spindled cells; A small zone is more cellular and shows focal mitotic activity.

- Should it automatically be labeled fibrosarcoma?
- Which tissue findings deserve additional sampling?
- How should stains be selected?

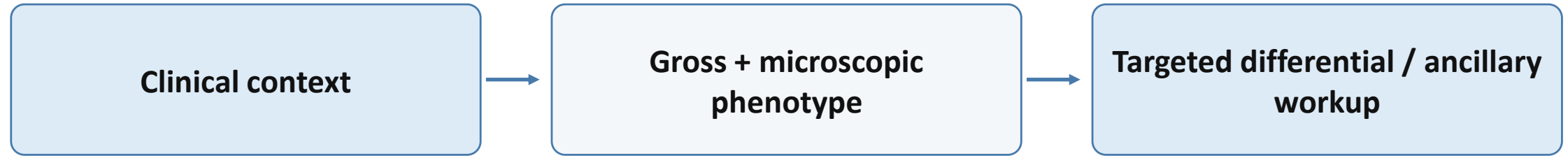
Vignette 3: Avoid the mitotic trap

- No: Some fibromas may be relatively cellular and mitotically active.
- Review atypia, necrosis, global architecture, and tumor interface.
- Sample suspicious areas adequately.
- Order immunostains to distinguish concrete morphologic alternatives.

Six discriminators that matter

Question	Most useful observation
Predominant lineage?	Fibroblastic versus theca-like cells
Stromal matrix?	Fibrous versus lipid-rich morphology
Gross pattern?	Solid, hard, pale, usually circumscribed
Clinical function?	Bleeding / endocrine context
Fluid phenotype?	Ascites with or without pleural effusion
Syndrome clues?	Gorlin-associated manifestations

Synthesis: Classification from evidence



Schematic — not a specimen

- Most ovarian fibromas/thecomas are benign.
- Separate established morphology from unverified mechanisms or thresholds.

Core principles for examination and practice

- Fibroma: Usually unilateral, firm gray-white, fibroblastic, and hormonally inactive.
- Thecoma: Plump lipid-containing stromal cells; May be hormonally active.
- Meigs syndrome combines ovarian tumor, ascites, and pleural effusion; Mechanism uncertain.
- Gorlin syndrome is an important uncommon association of ovarian fibroma.

References and source boundaries

Robbins, Cotran & Kumar. Pathologic Basis of Disease, 11th ed. (2026), Ch. 22, p. 932 (primary text).

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