

Choriocarcinoma

Gestational and placental disorders

Malignant trophoblastic neoplasia: morphology, spread and clinical relevance

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Learning objectives

After this session, you should be able to:

- Define gestational choriocarcinoma and identify its pregnancy-associated origins.
- Recognize the biphasic trophoblastic histology, lack of villi, and destructive invasion.
- Correlate bleeding, HCG behavior, metastatic pattern, and treatment response.

Gestational trophoblastic disease: The context

GTD comprises trophoblastic proliferations with distinct biological behavior.

- Major categories include hydatidiform moles, invasive mole, choriocarcinoma, PSTT, and ETT.
- Choriocarcinoma belongs to the frankly malignant end of this spectrum.
- Its distinction from molar lesions depends strongly on villous morphology and invasion.

GTD spectrum: Morphologic categories

Separate diagnostic categories: The boxes do not denote required sequential stages.

Hydatidiform mole

Invasive mole

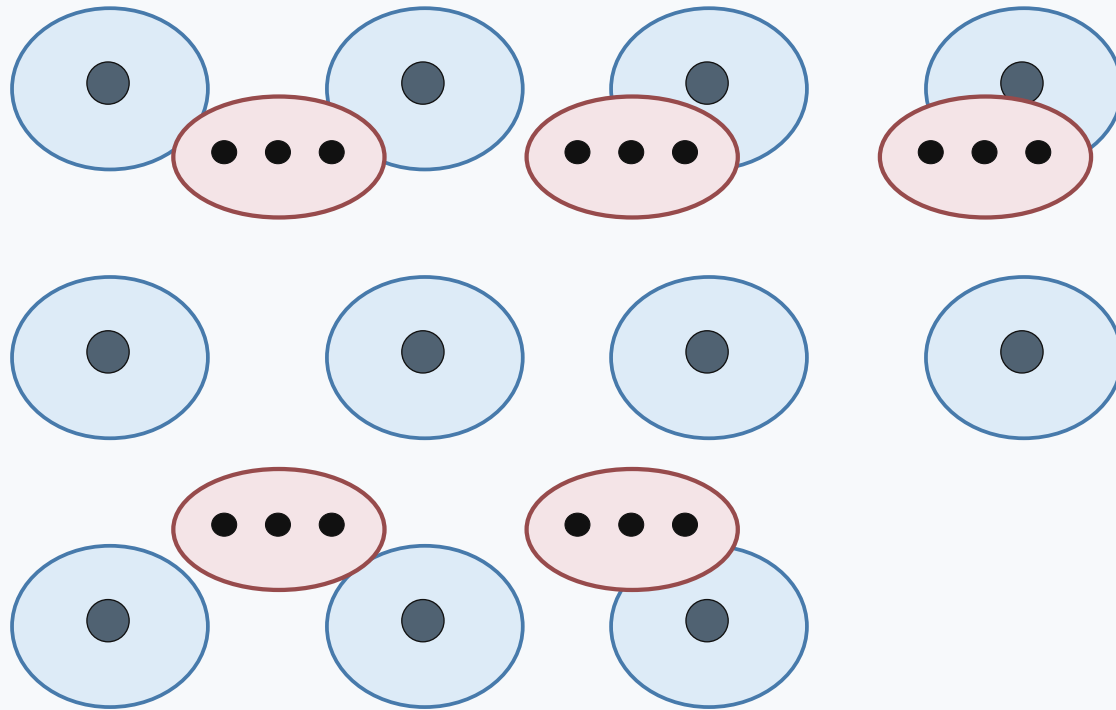
Choriocarcinoma

Two trophoblastic populations

The normal trophoblast provides the histologic vocabulary.

- Cytotrophoblast is a component of chorionic villous trophoblast.
- Syncytiotrophoblast is the second trophoblastic component described in villi.
- Choriocarcinoma contains proliferating malignant forms of both populations.

Trophoblastic cellular forms: Schematic



SCHEMATIC — not a histologic specimen

Biphasic cellular concept

- Cytotrophoblast: Mononuclear cells.
- Syncytiotrophoblast: Multinucleated cellular component.
- The schematic is illustrative; Morphology must be assessed on genuine sections.

Definition: Gestational choriocarcinoma

A malignant trophoblastic neoplasm originating from pregnancy.

- The antecedent pregnancy may have been normal or abnormal.
- Origin may follow an intrauterine or extrauterine pregnancy.
- The neoplasm is invasive and capable of early disseminated disease.

Four pathology signatures

The defining findings should be interpreted together.

- Proliferating malignant cytotrophoblast and syncytiotrophoblast.
- No chorionic villi within the tumor.
- Prominent hemorrhage and necrosis.
- Destructive invasion, including involvement of blood vessels.

Frequency in the United States

1 in

20,000–30,000 pregnancies

Gestational choriocarcinoma is uncommon.

- This is the frequency reported for U.S. Pregnancies.
- The denominator is pregnancies, not molar pregnancies.

Association with complete mole

50%

Of choriocarcinomas

Antecedent complete hydatidiform mole is the largest single group.

- The percentage describes antecedents among choriocarcinomas.
- It does not mean that half of all complete moles become malignant.

Antecedent pregnancy: Reported distribution

Antecedent pregnancy	Share	Interpretation
Complete hydatidiform mole	50%	Largest preceding category
Spontaneous abortion	25%	May arise after pregnancy loss
Normal pregnancy	Approximately 22%	May follow an apparently normal gestation
Ectopic / intraplacental	Remainder	Less frequent contexts

Proportions are those; Rounding means the remainder is not independently measured here.

Antecedent pregnancy is not always a mole

Gestational origin does not imply a preceding molar diagnosis.

- Choriocarcinoma may follow spontaneous abortion.
- It may emerge after a normal pregnancy.
- An ectopic pregnancy may be the antecedent event.

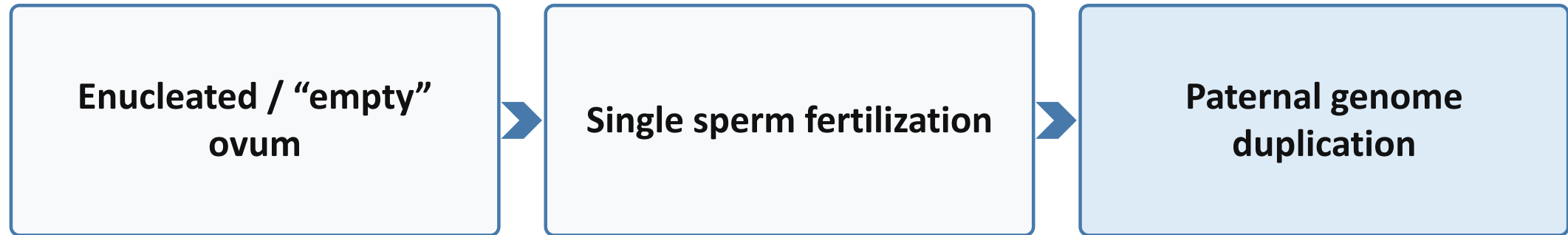
Why complete mole is important

Complete mole has a documented relationship to subsequent malignant disease.

- It is androgenetic: Nuclear genetic material is paternally derived.
- A 2.5% risk of subsequent choriocarcinoma after complete mole.
- It also cites a 15% risk of persistent or invasive mole.

Genetic basis of common complete mole

The common mechanism produces diploid 46,XX complete mole.



Complete versus partial mole: Key context

Complete mole

- Paternally derived nuclear genome.
- Usually diploid; No embryonic development.
- More established association with choriocarcinoma.

Partial mole

- Usually dispermic triploidy.
- Fetal development may occur.
- Not typically linked to postmolar choriocarcinoma.

This is antecedent-lesion context, not the morphology of choriocarcinoma.

Distinguish absolute and conditional risk

Two different denominators must never be conflated.

- About 50% of choriocarcinomas follow complete mole (antecedent distribution).
- About 2.5% of patients with complete mole develop choriocarcinoma (subsequent risk).
- These figures answer different epidemiologic questions.

Invasive mole versus choriocarcinoma

Invasive mole

- Hydropic chorionic villi infiltrate myometrium.
- Proliferating cytotrophoblast and syncytiotrophoblast line villi.
- Can show vascular invasion and distant embolization.

Choriocarcinoma

- Malignant trophoblast without chorionic villi.
- Marked hemorrhage and tumor necrosis.
- Destructive invasion and wide metastasis are characteristic.

Presence or absence of chorionic villi is a decisive morphologic distinction.

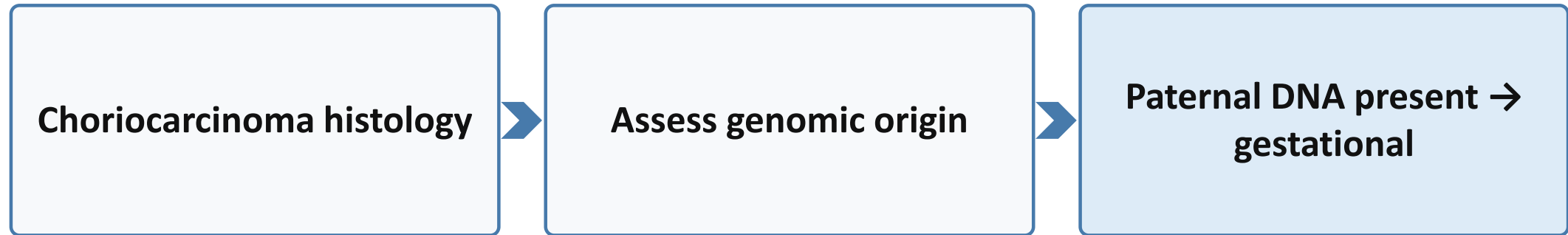
Nongestational choriocarcinoma

A rare morphologic counterpart develops outside a pregnancy origin.

- Can arise from germ cells in the ovary or mediastinum.
- Looks morphologically identical to gestational choriocarcinoma.
- Has a different genomic ancestry and generally less favorable prognosis.

Gestational versus nongestational lineage

Nongestational tumors lack paternally derived DNA.



Paternally derived DNA as a discriminator

Microscopic appearance alone may not establish pregnancy origin.

- Gestational choriocarcinoma contains paternal DNA.
- Nongestational choriocarcinoma lacks paternal-derived DNA.
- Genomic ancestry is the distinguishing feature.

Why lineage classification matters

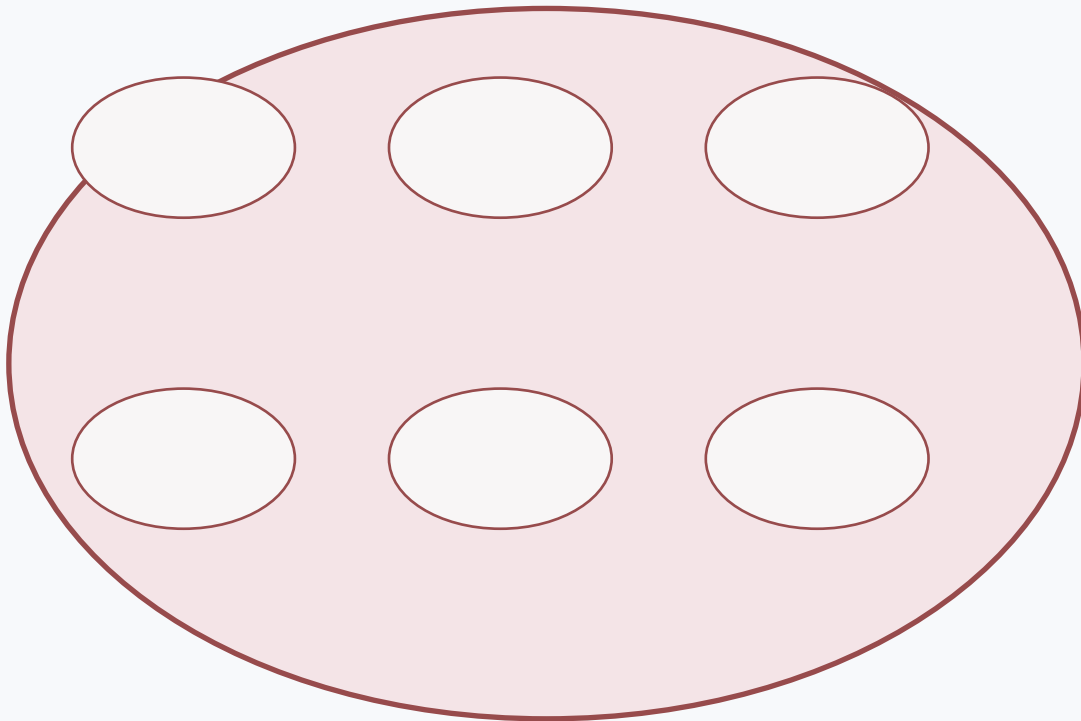
Gestational origin

- Related to prior pregnancy.
- Paternal DNA can establish origin.
- Often highly responsive to chemotherapy.

Nongestational origin

- Rare ovarian / mediastinal germ-cell origin.
- No paternally derived DNA.
- More difficult to treat; Less favorable outlook.

Gross pattern: Invasive hemorrhagic mass



Hemorrhage / necrosis schematic

SCHEMATIC — not a histologic specimen

Destructive hemorrhagic neoplasia

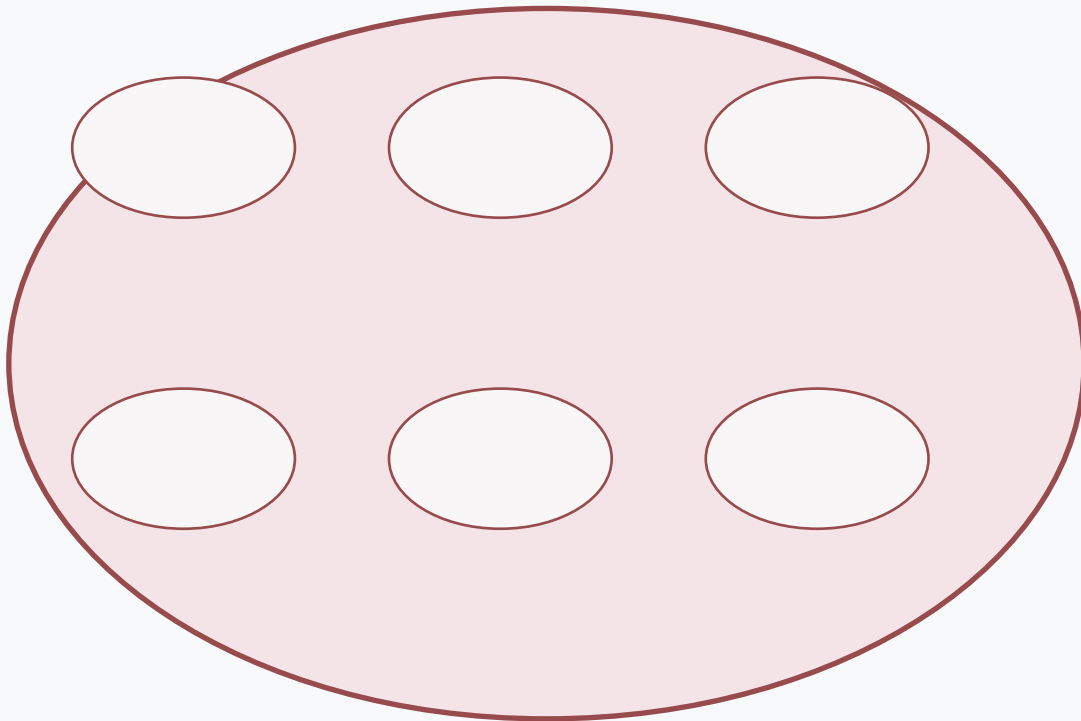
- Soft, fleshy, yellow-white tumor.
- Extensive hemorrhage often dominates the gross appearance.
- Large pale necrotic areas may coexist with viable tumor.

The tumor may appear yellow-white

Gross viable tumor and breakdown must be distinguished.

- The mass as soft and fleshy.
- Yellow-white neoplastic areas may be present.
- Necrosis and hemorrhage commonly obscure the gross background.

Hemorrhage and necrosis are characteristic



Hemorrhage / necrosis schematic

SCHEMATIC — not a histologic specimen

A hallmark of aggressive growth

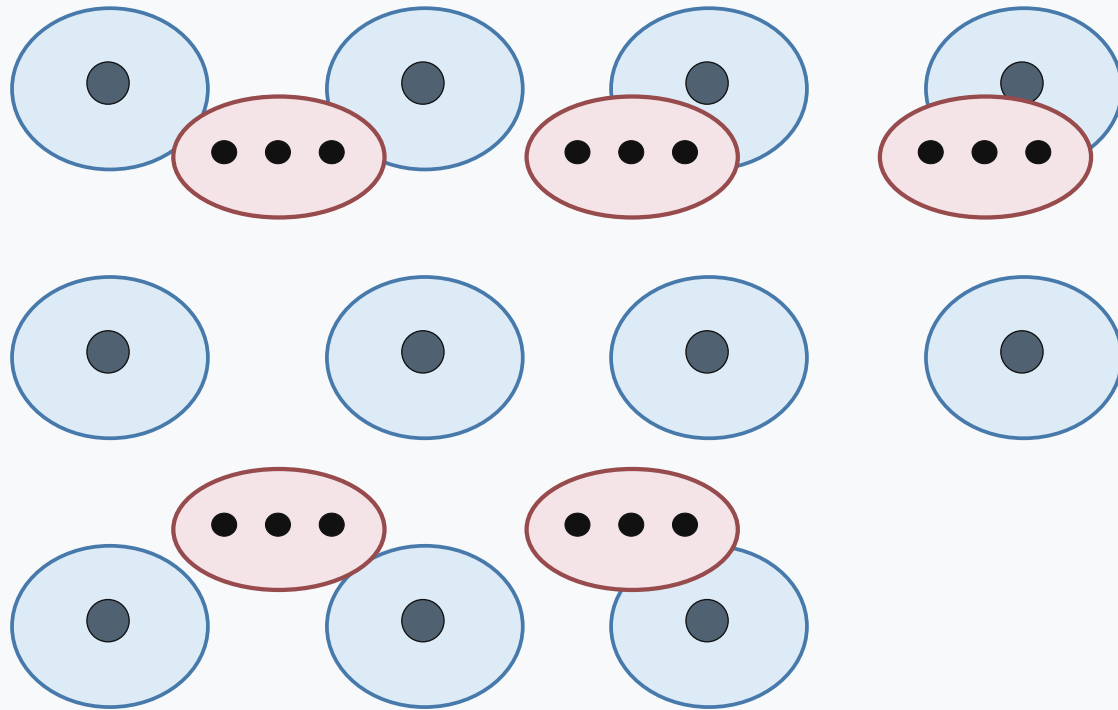
- Large hemorrhagic regions are common.
- Pale necrotic areas are also frequent.
- A gross impression alone is insufficient for definitive cellular diagnosis.

Gross pattern and clinical bleeding

The destructive lesion explains its hemorrhagic presentation.

- Myometrial and vascular invasion underlie tissue disruption.
- Tumor-associated hemorrhage parallels irregular vaginal bleeding.
- The amount of viable tumor may be reduced by extensive necrosis.

Biphasic trophoblastic proliferation



SCHEMATIC — not a histologic specimen

Two malignant trophoblast populations

- Proliferating cytotrophoblasts.
- Proliferating syncytiotrophoblasts.
- Both populations form the defining tumor-cell composition.

Cytotrophoblast is one tumor component

Recognition requires careful inspection of cellular phenotype.

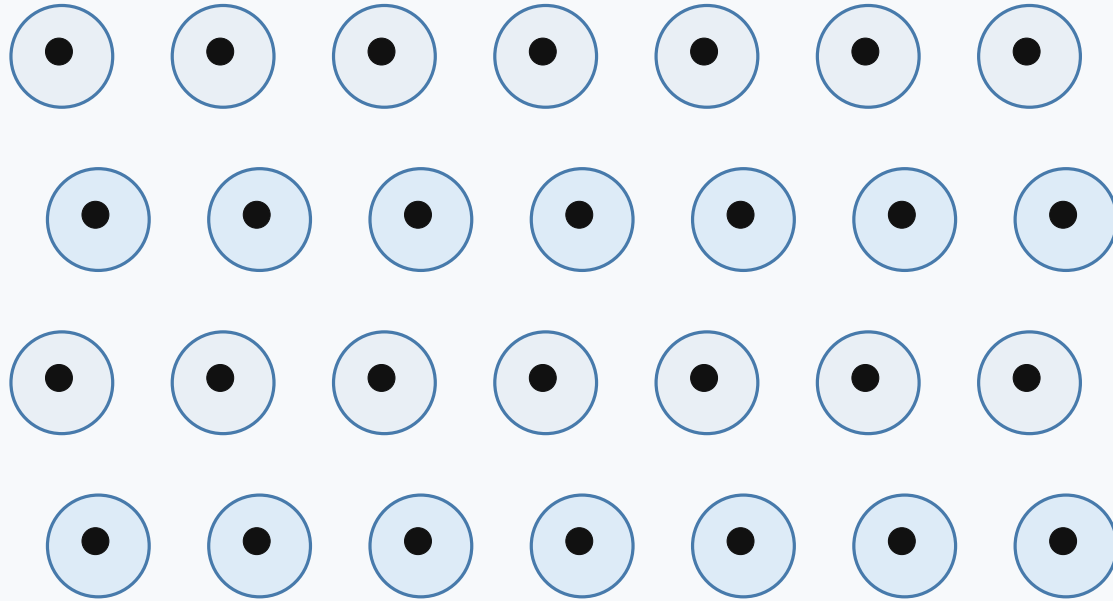
- Cytotrophoblast contributes a recognizable mononuclear population.
- It coexists with malignant syncytiotrophoblast.
- The tumor is not described as a purely single-cell population.

Syncytiotrophoblast is the second component

The tumor reproduces trophoblastic cellular differentiation.

- Syncytiotrophoblast is part of the malignant proliferative component.
- Its coexistence with cytotrophoblast creates the biphasic pattern.
- High HCG values are commonly associated with gestational disease.

Chorionic villi are absent



SCHEMATIC — not a histologic specimen

Absence is a positive diagnostic clue

- The neoplasm is composed of malignant trophoblasts.
- Hydropic chorionic villi are not part of the tumor.
- Compare with invasive mole, where villi infiltrate myometrium.

Mitoses: Numerous and sometimes atypical

Proliferative activity supports the malignant interpretation.

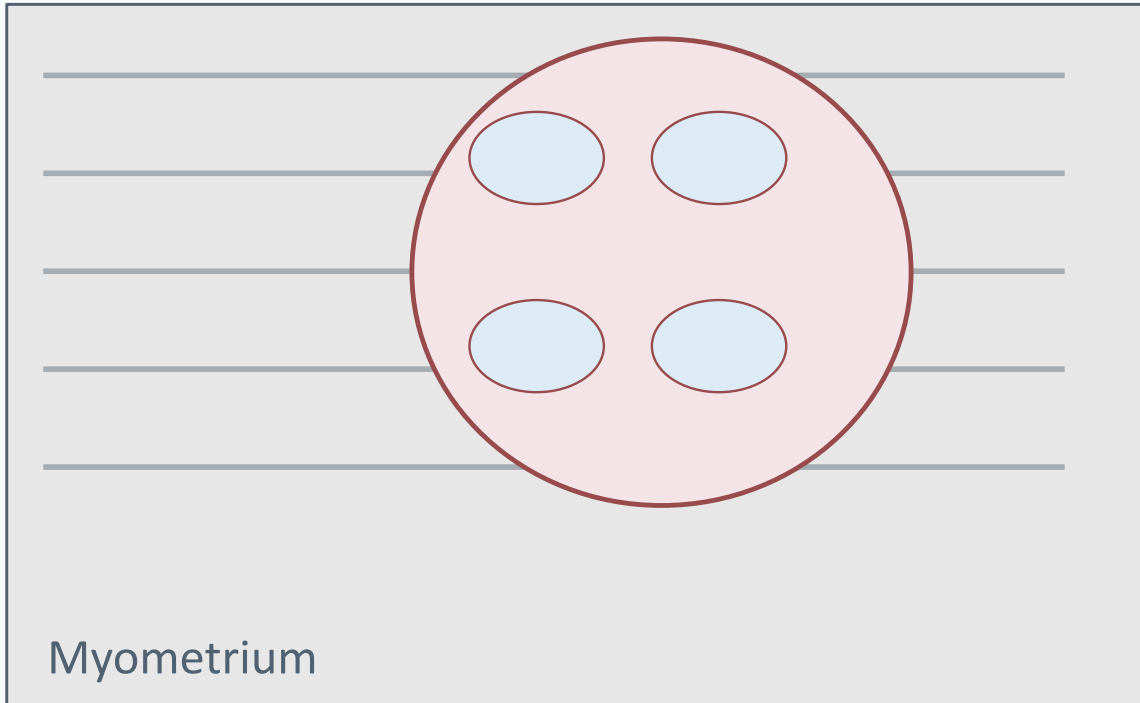
- Abundant mitotic figures are described.
- Some mitoses are abnormal.
- Mitotic appearance is interpreted alongside invasion and villous absence.

Histologic diagnosis is integrative

No single element should be taught in isolation.

- Malignant biphasic trophoblast plus absent villi establishes morphology.
- Hemorrhage and necrosis reinforce the recognition pattern.
- Invasive growth explains clinical behavior.

Myometrial invasion

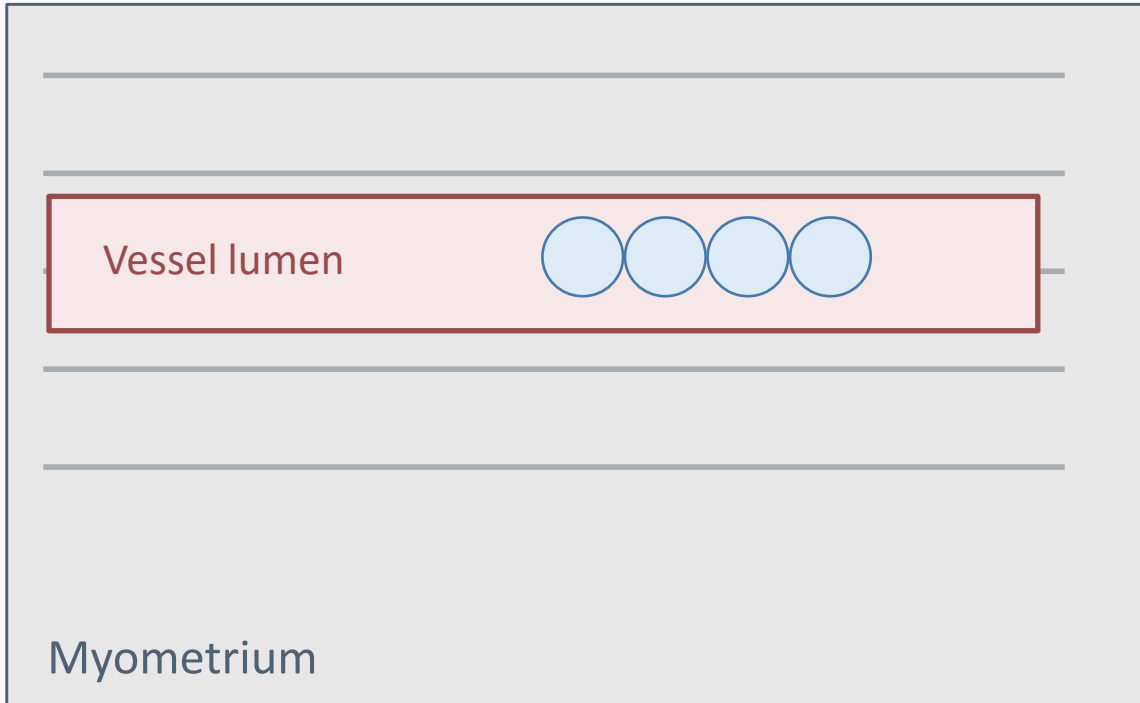


SCHEMATIC — not a histologic specimen

Tumor breaches underlying uterine wall

- Tumor infiltrates the myometrium.
- Invasion is destructive rather than limited to a luminal mass.
- The lesion may progress to deep mural involvement.

Vascular invasion



SCHEMATIC — not a histologic specimen

Blood-vessel penetration is frequent

- Tumor frequently invades maternal blood vessels.
- Vascular access supports hematogenous dissemination.
- An aggressive local lesion may already have distant deposits.

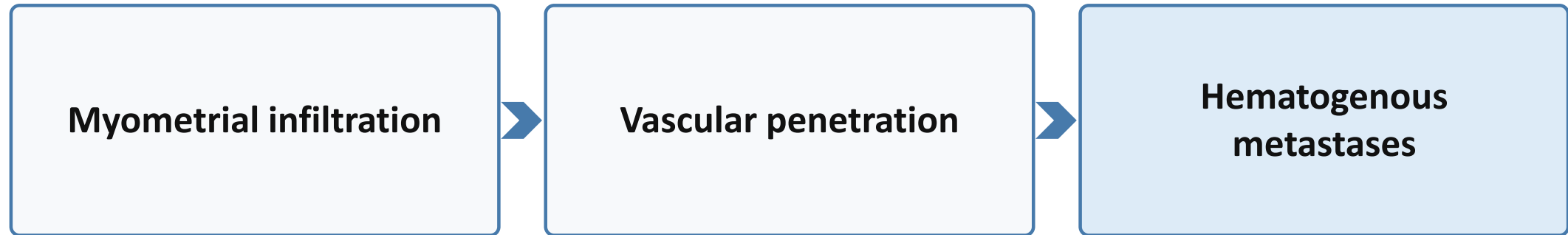
Extent beyond the uterine wall

Advanced direct extension is anatomically possible.

- The neoplasm may reach the uterine serosa.
- Adjacent structures may be involved in some cases.
- This is additional to, not equivalent to, distant hematogenous metastasis.

Local invasion to systemic dissemination

Causal sequence supported by the invasive and blood-borne behavior described.



Typical presentation: Irregular vaginal spotting

The symptom can follow multiple pregnancy scenarios.

- Vaginal spotting may be bloody or brown.
- It may occur in an apparently normal pregnancy.
- It can present after miscarriage or uterine curettage.

Bleeding character and tissue injury

The characteristic discharge is a clue, not a standalone test.

- Discharge of bloody, brown fluid.
- Extensive hemorrhage is a dominant gross pathology feature.
- Clinical symptoms must be integrated with HCG, history, and pathology.

Timing of clinical recognition

Latency does not eliminate a gestational relationship.

Pregnancy or pregnancy
loss

Curettage / delivery may
occur

Symptoms may arise
months later



A normal antecedent pregnancy does not exclude it

Postpartum or postgestational presentation can be misleading.

- About 22% follow normal pregnancies (Robbins).
- Clinical appearance may be delayed for months.
- A pregnancy history remains relevant even without a prior mole.

HCG is typically markedly elevated

The endocrine signal often supports the clinical suspicion.

- Values are typically greater than those seen with hydatidiform moles.
- Persistent elevation after a molar pregnancy may suggest ongoing trophoblastic disease.
- Absolute thresholds are not specified in the supplied section.

Low HCG does not exclude choriocarcinoma

Exceptions prevent rigid threshold-based thinking.

- Occasional tumors produce relatively little HCG.
- Extensively necrotic tumors can have low HCG levels.
- Robbins does not define a universal minimum diagnostic concentration.

HCG interpretation: Common pattern and exception

Typical biochemical pattern

- Elevated HCG, often above molar values.
- Follow-up after evacuation is relevant.
- An elevated level raises concern with compatible findings.

Important exception

- Some tumors secrete little HCG.
- Extensive tumor necrosis may lower measured HCG.
- Low HCG alone cannot refute convincing morphology.

Postmolar follow-up has a diagnostic purpose

Persistent HCG may signal clinically important residual disease.

- After molar evacuation, HCG is followed to nonpregnant levels.
- Continued elevation raises concern for invasive mole or choriocarcinoma.
- The parent section describes monitoring for 6 months to 1 year.

HCG in choriocarcinoma versus PSTT

Choriocarcinoma

- Usually very elevated HCG.
- Some low-HCG exceptions exist.
- Marked hemorrhagic, destructive invasion.

Placental site trophoblastic tumor

- HCG is moderately elevated.
- Mononuclear or binucleated extravillous trophoblasts.
- Vascular tropism without similarly destructive hemorrhage.

Disseminated disease may be present early

Local tumor bulk is not a reliable surrogate for spread.

- Widespread metastases are characteristic.
- Chest and bone imaging may disclose distant deposits at presentation.
- Invasion of blood vessels provides a mechanism for early metastasis.

Lungs: The most common metastasis

50%

Of choriocarcinoma cases

Hematogenous spread explains lung involvement.

- Lungs are the leading metastatic site cited.
- The percentage represents the source description; It is not a staging criterion.

Vagina: Another frequent metastatic site

30–40%

Reported frequency

Vaginal metastasis is especially important to recognize.

- It is the second commonest site listed.
- It may coexist with metastasis to distant organs.

Additional sites: Ordered metastatic pattern

Order after lung / vagina	Site
Next	Brain
Next	Liver
Next	Bone
Next	Kidney

Descending order follows the source, which provides no specific percentages for these four sites.

Hematogenous spread: Clinicopathologic logic

An explanatory schematic; Not a quantitative model of organ-specific probabilities.



Clinical evaluation: Imaging of spread

The metastatic pattern informs the reported imaging findings.

- Chest imaging may reveal metastatic lesions.
- Bone imaging may also detect distant disease.
- The source excerpt does not prescribe a particular staging-imaging algorithm.

Intraplacental choriocarcinoma

A tumor may be present within the placenta during pregnancy.

- It may appear as a grossly identifiable placental mass.
- It may also be associated with widespread metastatic disease.
- This presentation differs from a tumor recognized months after delivery.

Occult primary tumor hypothesis

A small placental primary may escape recognition at delivery.

- Robbins suggests postgestational tumors probably originated in the placenta.
- The hypothesis is that small lesions were unrecognized at birth.
- This is presented as likely, not as proven for each patient.

Placental masses require histology

An important pathology practice implication follows.

- Intraplacental choriocarcinoma may be grossly visible.
- Gross findings alone cannot settle the diagnosis.
- Careful histologic examination of placental masses.

Choriocarcinoma and invasive mole

Choriocarcinoma

- No chorionic villi.
- Marked destructive hemorrhage and necrosis.
- Malignant syncytio- and cytotrophoblasts.

Invasive mole

- Hydropic villi persist within invasive lesion.
- Villous trophoblast infiltrates uterine wall.
- Elevated HCG and vaginal bleeding can overlap.

Choriocarcinoma and PSTT

Choriocarcinoma

- Biphasic cytotrophoblast / syncytiotrophoblast.
- Destructive, hemorrhagic invasion.
- HCG commonly very high.

PSTT

- Mononuclear / binucleated extravillous trophoblast.
- Infiltration with less destruction or hemorrhage.
- HCG often moderately elevated.

Choriocarcinoma and ETT

Choriocarcinoma

- Two malignant trophoblastic populations.
- Prominent vascular and destructive invasion.
- High propensity for widespread metastasis.

Epithelioid trophoblastic tumor

- Mononuclear trophoblastic tumor cells.
- Often abundant clear cytoplasm.
- Less overt invasion than PSTT, but can metastasize.

Four-entity differential: Decisive features

Entity	Villi	Dominant neoplastic cells	Behavior
Invasive mole	Present	Villous trophoblast	Myometrial invasion; emboli possible
Choriocarcinoma	Absent	Cyto- + syncytiotrophoblast	Hemorrhagic vascular invasion
PSTT	Absent	Extravillous mononuclear cells	Vascular tropism; less hemorrhage
ETT	Absent	Mononuclear cells; often clear	Metastatic potential

Villi status and cellular phenotype are pathology-oriented discriminators.

Therapy depends on stage

The source describes management as stage dependent.

- Evacuation of uterine contents is typically part of treatment.
- Chemotherapy is the major effective systemic therapy.
- No regimen, dosage, or stage algorithm is supplied in the chapter excerpt.

Broad treatment pathway

Illustrates reported treatment components, not a prescriptive guideline.



Chemotherapy response

Nearly 100%

Remission reported for
gestational disease

A notably chemosensitive malignant tumor.

- High remission and cure rates.
- This does not justify applying the same prognosis to nongestational disease.

Reproductive outcomes after treatment

Cure often preserves the possibility of future pregnancy.

- Many cured patients subsequently have normal pregnancies.
- Normal deliveries after cure are reported.
- This is a qualitative textbook statement, not an individually predictive rate.

Nongestational tumors are different

The prognostic comparison is biologically important.

- Rare germ-cell-derived tumors may originate in ovary or mediastinum.
- They can be histologically indistinguishable from gestational tumors.
- Poorer prognosis and more difficult treatment.

Case A: Bleeding after complete mole

After evacuation of a complete hydatidiform mole, a patient has persistent vaginal bleeding and HCG remains elevated.

Clinical–pathological reasoning

- Which trophoblastic entities must be considered?
- What histologic finding favors choriocarcinoma over invasive mole?

Case A: Integrated answer

Persistent postmolar disease has more than one morphologic explanation.

- Persistent / invasive mole and choriocarcinoma are both important possibilities.
- Hydropic villi within infiltrating tissue favor invasive mole.
- Malignant biphasic trophoblast without villi favors choriocarcinoma.

Case B: Low HCG with a necrotic tumor

A postgestational uterine mass has extensive necrosis and hemorrhage. The HCG elevation is much less marked than anticipated.

Clinical–pathological reasoning

- Does a relatively low HCG value exclude choriocarcinoma?
- Which morphological features remain critical?

Case B: Integrated answer

Endocrine behavior has recognized pathological exceptions.

- Low hormone output and extensive necrosis are both described exceptions.
- Biphasic malignant trophoblast and absence of villi are decisive clues.
- Vascular / myometrial invasion supports malignant behavior.

Case C: A postdelivery placental mass

At delivery, a placental mass is identified. A later examination reveals a trophoblastic neoplasm and distant deposits.

Clinical–pathological reasoning

- What rare primary tumor must be considered?
- What practice recommendation follows for placental masses?

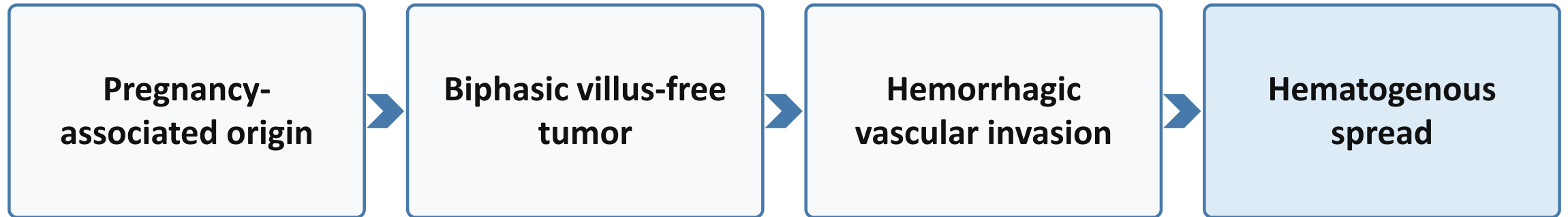
Case C: Integrated answer

Intraplacental choriocarcinoma can be clinically consequential.

- Choriocarcinoma may originate within the placenta during pregnancy.
- It may produce a mass or already disseminated disease.
- Placental masses warrant careful histologic examination.

Integrated disease model

The source-linked conceptual sequence is not an inevitable timeline.



Take-home diagnostic synthesis

The smallest useful set of facts is a morphologic–clinical integration.

- Pregnancy-associated malignant trophoblast: Syncytio- and cytotrophoblast.
- Chorionic villi absent; Necrosis, hemorrhage, mitoses and invasion prominent.
- Irregular bleeding, often high HCG, and metastatic spread are characteristic.
- Gestational choriocarcinoma is highly chemotherapy responsive.

References and image provenance

Primary textbook

- Robbins, Cotran & Kumar: Pathologic Basis of Disease, 11th ed. (2026), Chapter 22: The Female Genital Tract, pp. 939–942.
- Choriocarcinoma section (pp. 940–941); Gestational trophoblastic disease and hydatidiform mole sections (p. 940); tumors of extravascular trophoblasts (p. 942).

Visuals

All diagrams are original editable PowerPoint schematics; no authentic histology or textbook image is reproduced.