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Struma ovarii

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Abstract
Struma ovarii is a rare and specialized variant of ovarian teratoma composed predominantly of mature thyroid tissue. It represents approximately 1-5% of ovarian teratomas and less than 1% of all ovarian tumors. Although most cases are benign and asymptomatic, a small proportion may produce thyroid hormones leading to hyperthyroidism or undergo malignant transformation into papillary or follicular thyroid carcinoma. Struma ovarii usually occurs in women of reproductive age and is commonly unilateral. Clinical presentation varies from an incidental pelvic mass to pelvic pain, abdominal distension, menstrual irregularities, or thyrotoxic symptoms in functioning tumors. Diagnosis relies on imaging studies and laboratory findings, with confirmation by histopathology. Management primarily involves surgical excision, while malignant or metastatic cases may require thyroidectomy and radioactive iodine therapy. The prognosis is generally favorable, but long-term follow-up is recommended due to the risk of recurrence and rare complications.

Keywords: Struma ovarii, ovarian teratoma, thyroid tissue, hyperthyroidism, malignant transformation, ovarian tumor, thyrotoxicosis, surgical management

Introduction
Struma ovarii is a rare, specialized form of ovarian teratoma composed predominantly of mature thyroid tissue. It accounts for approximately 1-5% of all ovarian teratomas and <1% of all ovarian tumors. Although typically benign, struma ovarii can occasionally undergo malignant transformation, most commonly to papillary or follicular thyroid carcinoma. Recognition of this entity is clinically significant due to its unique endocrine and radiologic feature.

Definition
Struma ovarii is a rare type of ovarian teratoma in which thyroid tissue constitutes more than 50% of the tumor and produce thyroid hormones, sometimes leading to hyperthyroidism.

JiEPIDEMIOLOGY
- Occurs mainly in reproductive age women (30-60 yrs)
- Rare incidenc
- Majority of cases unilateral
- Bilateral involvement <5%
- Hyperthyroidism develops in only ~5-10% of patients

Types of Struma Ovarii
1. Benign Struma Ovarii
- Composed of mature thyroid tissue
- Most common type (≈95%)
- Often asymptomaticMay occasionally cause hyperthyroidism

2. Malignant Struma Ovarii
- Papillary thyroid carcinoma (most common)
- Follicular thyroid carcinoma
- Poorly differentiated or anaplastic carcinoma (rare)
- Potential for metastasis: peritoneum, liver, bones, lungs

3. Functional (Hyperthyroid-producing) Struma Ovarii

- This form actively secretes thyroid hormones
- Leads to hyperthyroidism / thyrotoxicosis
- TSH suppressed, ovarian mass shows radioactive iodine uptake

4. Struma Ovarii within Ovarian Teratoma

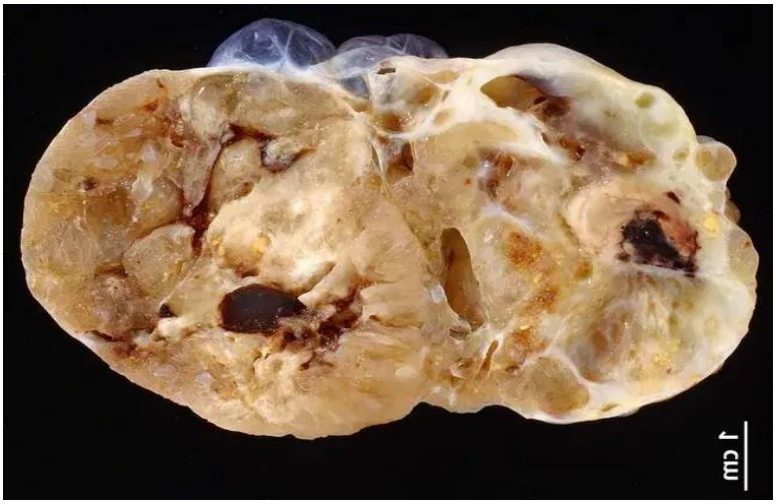
- Mixed mature teratomatous tissues present
- Thyroid tissue ≥50% of the specimen → termed struma ovarii
- Can be benign or rarely malignant

Pathogenesis

Struma ovarii originates from totipotent germ cells within a mature cystic teratoma. These cells differentiate into thyroid follicular epithelium, forming colloid-filled follicles resembling normal thyroid tissue.

Malignant progression involves

Genetic instability of teratomatous thyroid cells
Activation of RAS/BRAF pathways in rare malignant variants



Metastasis pattern mimics thyroid carcinomas

Fig 1: Struma ovarii

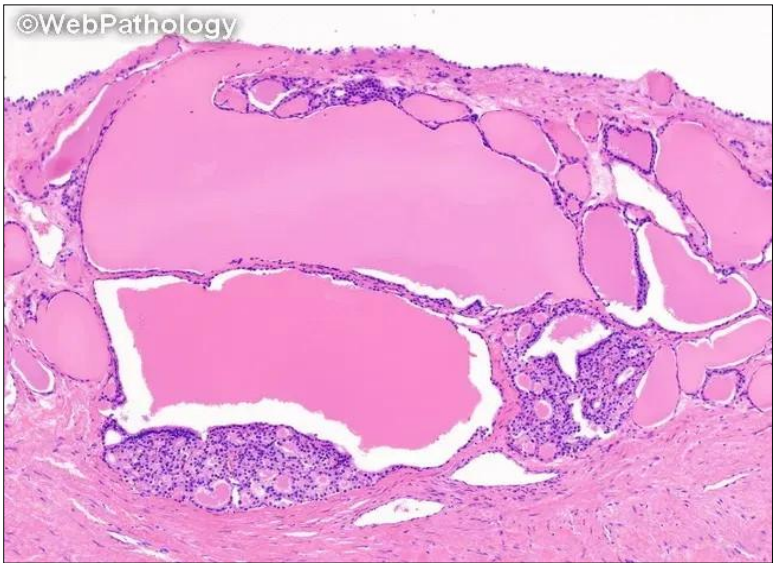


Fig 2: Benign struma ovarii

Pathophysiology

Germ Cell Origin in Ovary
↓
Teratomatous Differentiation
↓
Development of Thyroid Follicular Tissue within Ovary
↓
Functional Thyroid Tissue Produces Thyroid Hormones (T3/T4)
↓
↑ Circulating T3/T4
↓

Negative Feedback Inhibition of Pituitary
↓
↓ TSH Levels
↓
Systemic Hyperthyroid Symptoms (in functioning struma ovarii)
- Tachycardia
- Weight loss
- Heat intolerance
- Anxiety/tremor
Malignant Struma Ovarii Pathophysiology
Struma Ovarii (benign)
↓ (rare malignant transformation)
Genetic Mutations (BRAF, RAS, RET)
↓
Thyroid-type Carcinogenesis within Ovary
↓
Papillary or Follicular Thyroid Carcinoma Features
↓
Local Ovarian Invasion
↓
Lymphatic or Hematogenous Spread
↓
Metastasis (pelvis, peritoneum, bone, lung
Hormone-secreting Variant (Thyrotoxicosis subtype)

Functioning Thyroid Follicles in Ovary
↓
Unregulated T3/T4 Production independent of pituitary control
↓
Peripheral Thyroid Hormone Excess
↓
Suppressed TSH in Pituitary
↓
Systemic Hypermetabolic State

Signs and symptoms
- Gynecologic Symptom
- Pelvic pain
- Abdominal distension
- Palpable pelvic mass
- Menstrual iirregularities

Thyrotoxic Symptoms (if functioning) Tachycardia
- Heat intolerance
- Weight loss
- Anxiety & tremors
- Elevated T4, suppressed TSH

Diagnostic work-up
- Physical Examination
- Pelvic mass on bimanual exam
- Goiter typically absent, unlike systemic hyperthyroidism

Laboratory Findings
Thyroid function tests abnormal only if hormonally active
Serum thyroglobulin may be elevated
Imaging
- **Ultrasound:** complex, cystic-solid ovarian mass
- **MRI:** areas of low signal intensity due to viscous colloid
- **CT:** variable attenuation depending on colloid density

Management
- Benign Struma Ovarii
- Surgical resection
- Cystectomy or unilateral oophorectomy

Malignant Struma Ovarii
1. Surgical staging similar to ovarian carcinoma
2. Total thyroidectomy sometimes recommended
3. Radioactive iodine therapy if metastasis or extra-ovarian spread

Thyroid suppression with levothyroxine.
Prognosis
- Benign cases: Excellent outcome
- Malignant transformation: Rare, but can metastasize
- Long-term survival generally favorable with appropriate management
- Recurrence rate low, but follow-up monitoring recommended.

Complications
- Ovarian torsion
- Rupture
- Malignant transformation
- Thyrotoxicosis and thyroid storm (rare)

Follow-up
- After surgery:
- Monitor pelvic recurrence by imaging
- Thyroid function tests periodically in functioning

variants
- Thyroglobulin monitoring in malignant cases.

Nursing Diagnosis

1. Hyperthermia related to increased metabolic rate secondary to thyroid-hormone-secreting ovarian tumor.
2. Decreased Cardiac Output related to tachycardia and increased cardiac workload.
3. Acute Pain related to abdominal mass effect or post-operative surgical incision.
4. Anxiety related to uncertainty of diagnosis, treatment outcomes, and potential malignancy.
5. Deficient Knowledge related to unfamiliarity with condition, treatment, and long-term follow-up needs.

Conclusion

Struma ovarii is an uncommon ovarian tumor distinguished by its thyroid tissue composition. While typically benign, its unique endocrine capability and potential malignant transformation require careful diagnosis and multidisciplinary management. Awareness of its clinical presentation and imaging-histopathologic correlation is essential for optimal treatment and prognosis.

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