

Fetus in fetu

Fetus in fetu (FIF) is a rare congenital anomaly where a malformed parasitic twin is incorporated into the body of its normally developing host twin. Unlike teratomas, FIF shows evidence of organogenesis, including vertebral segmentation and limb buds.

Etiopathogenesis

- **Embryological Basis:** FIF is believed to result from **abnormal monozygotic, monochorionic diamniotic twin development**, where **unequal division of totipotent cells** leads to one twin becoming incorporated into the body of the other during **ventral folding** of the trilaminar disc.
- **Parasitic Twin Theory:** Most accepted explanation; a malformed, non-viable twin is enveloped and sustained by the host twin's circulation.
- **Teratoma Theory:** Postulates that FIF is a highly differentiated form of mature teratoma; however, this is less favored due to the organized structure seen in FIF.

Key Differences: FIF vs Teratoma

Feature	Fetus in Fetu (FIF)	Teratoma
Origin	Parasitic twin	Germ cell tumor
Organization	Well-developed axial skeleton and limbs	Disorganized mass of pluripotent tissue
Malignant potential	<i>None</i> (benign)	<i>Potentially malignant</i> , esp. sacrococcygeal
Location	Retroperitoneal (most common)	Can be midline: sacrococcygeal, mediastinal
Vascular supply	From host twin	Autonomously vascularized

Anatomical Sites

- **Most Common:** Retroperitoneal (~70%)
- **Other Sites:** Sacrococcygeal region, intracranial, mediastinal, oral cavity, and scrotum.

Clinical Features

- Usually presents in **infants or young children**
- **Abdominal distension or palpable mass**
- May cause **compression symptoms**: vomiting, constipation, urinary retention
- **No systemic signs of malignancy**

Investigations

Imaging

- **Plain X-ray/CT/MRI:**
 - Shows **well-formed vertebral column** , limb buds, and other skeletal elements
 - **CT scan** is diagnostic: reveals a mass with a well-organized axial skeleton
- **Ultrasound:**
 - May show a heterogeneous mass with cystic and echogenic components
 - Can demonstrate motionless limbs or ossified bones
- **MRI:**
 - Offers detailed soft tissue definition; useful in CNS or mediastinal cases

Differentiating from Teratoma:

- Absence of vertebral axis or limb buds in teratomas
- Lack of organogenesis in teratomas

Histopathology

- Demonstrates **well-differentiated tissues** with evidence of somite segmentation and organ development.
- No evidence of neoplastic features seen in teratomas.

Management

- **Definitive Treatment:** *Surgical excision*
 - Relieves compression, confirms diagnosis
 - Prevents future complications such as hemorrhage, infection, or mass effect
- **Prognosis:** Excellent with complete resection
 - **Recurrence is rare**
 - **Malignant transformation is extremely rare** , unlike teratomas

Differential Diagnosis

- **Teratoma (mature or immature)**
- **Neuroblastoma**
- **Wilms tumor**
- **Mesenteric cyst**
- **Enteric duplication cyst**

Key Points for NCLEX/USMLE

- **FIF is not a tumor** , but a rare form of parasitic twinning.
- **Radiologic hallmark:** Axial skeleton and limb-like structures on imaging.
- **Treatment is complete surgical excision.**
- Always distinguish from **teratoma** due to the latter's **malignant potential** .
- **Most common site:** Retroperitoneum.