

# Spotting Fetal Tumors Early: Enhancing Prenatal Diagnosis with Antenatal Ultrasound

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**Abstract:** *Fetal tumors are rare entities that may significantly influence maternal health, fetal well-being, and perinatal outcome. Early antenatal detection is essential for prognostication, counseling, and multidisciplinary management. Objective of the study is to evaluate the role of antenatal ultrasound in the detection and characterization of fetal tumors and to assess associated outcomes. It is a prospective observational study conducted in the Tertiary Health Care Centre of South Gujarat over a period of 5 months. Seven pregnant women undergoing anomaly scans with detected tumoral lesions were included. Among seven cases, lymphangioma was the most common diagnosis, followed by arachnoid cyst, congenital pulmonary airway malformation, and intra-abdominal cysts likely of gonadal origin. Ultrasound enabled lesion characterization, assessment of vascularity, mass effect, and prognostic indicators such as CVR ratio in CPAM. Conclusion: Antenatal ultrasound plays a pivotal role in early diagnosis, risk stratification, and management planning of fetal tumors. Multidisciplinary collaboration improves perinatal outcomes.*

**Keywords:** Fetal tumors, Antenatal ultrasound, Prenatal diagnosis, Perinatal outcome, Multidisciplinary care

## 1. Introduction

Fetal tumors are rare but clinically significant conditions that may impact pregnancy management and neonatal prognosis. It is essential to distinguish between *fetal tumors* and *fetal malignancies*, as not all tumors are malignant.

Fetal tumors are not usually associated with an underlying chromosomal defect or more complex abnormalities or syndromes with the following noteworthy exceptions:

- Lipoma of the corpus callosum, frequently associated with agenesis of the corpus callosum (ACC).
- Beckwith–Wiedemann syndrome, associated with increased risk of Wilms tumor and hepatoblastoma.

Advances in high-resolution ultrasonography have significantly enhanced early detection, anatomical delineation, and follow-up of fetal masses. In selected cases, fetal MRI serves as a complementary modality for further characterization.

## 2. Materials and Method

This is a prospective observational study conducted at Tertiary Health Care Centre of South Gujarat over a period of 5 months. We included 7 patients in the study.

**Inclusion Criteria:** All consenting pregnant women undergoing anomaly scan with sonographically detected tumoral lesions

Detailed ultrasound evaluation included lesion size, echogenicity, vascularity (color Doppler), anatomical extent, associated anomalies, and mass effect. Follow-up and outcomes were documented where available.

## 3. Case Series

### Case 1

A 20-year-old primigravida presented for anomaly scan. Ultrasound revealed a large multiseptated avascular cystic lesion arising from the right side of the neck, extending to the umbilical cord insertion and involving anterior and lateral thoracic and abdominal walls.



Figure (1-4)

Outcome: Abortus

Diagnosis: Lymphangioma.

### Case 2

A 30-year-old G2P1L1 presented for anomaly scan. A 34 × 21 mm anechoic cystic lesion was noted in the supratentorial region, compressing the left ventricle.



Figure (5-8)

**Impression:** Supratentorial arachnoid cyst.

**Advice:** Postnatal fetal MRI for confirmation and exclusion of associated CNS anomalies.

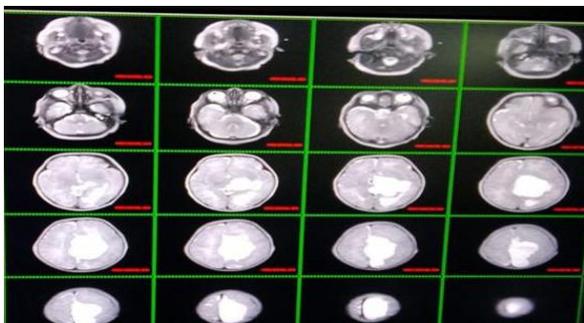


Figure (9)

**Case 3**

A 22-year-old primigravida showed a large multiseptated multicystic irregular mass in the right lateral chest, extending to the right axilla and forearm.



Figure (10-11)

**Impression:** Lymphangioma.

**Case 4**

A 23-year-old primigravida demonstrated a 4.3 × 4.2 × 4.4 cm anechoic avascular cystic lesion in the left lower abdomen, above the bladder and lateral to the left kidney.

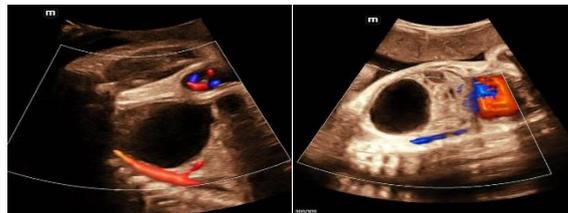
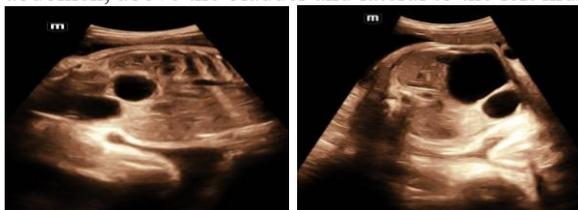


Figure (12-15)

**Impression:** Intra-abdominal cyst; likely gonadal cyst.

**Case 5**

A 20-year-old G2P1L1 presented with a multiloculated cystic lesion in the right lung (29 × 24 × 22 mm), causing contralateral mediastinal shift. A feeding vessel from the pulmonary artery was identified on three-vessel tracheal view.



Figure (16-17)

**Diagnosis:** Congenital pulmonary airway malformation (macro-cystic type).

**CVR Ratio:** 0.47 (favourable prognosis)

**Case 6**

A 20-year-old woman undergoing first antenatal ultrasound showed a 13 × 13 mm anechoic cystic lesion in the lower abdomen near the right bladder wall and lower pole of the right kidney.



Figure (18-19)

**Impression:** Gonadal cyst versus mesenteric cyst.

**Case 7**

A 20-year-old G2P1L1 demonstrated a (37 × 31 × 39) mm multiloculated avascular cystic mass extending from behind the left ear to the left neck and anterior chest.

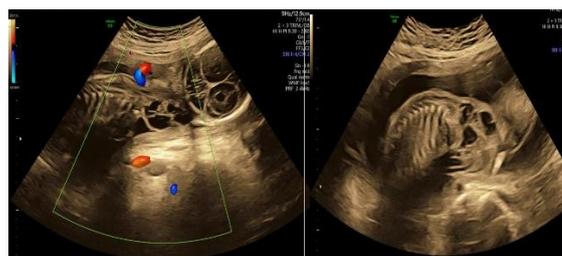
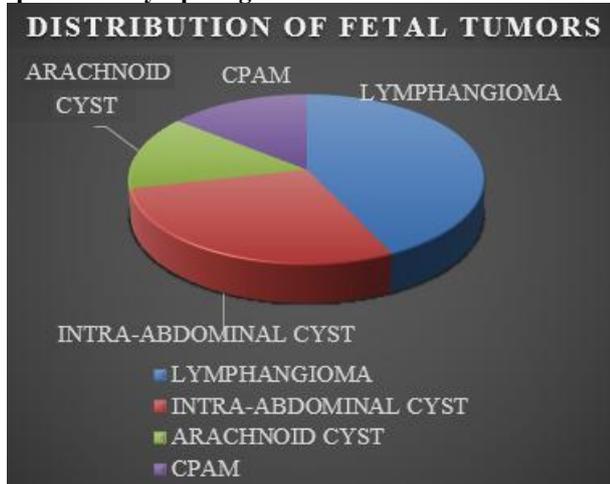




Figure (20-22)

Impression: Lymphangioma.



Pie Chart (1): Demonstrating distribution of fetal tumors

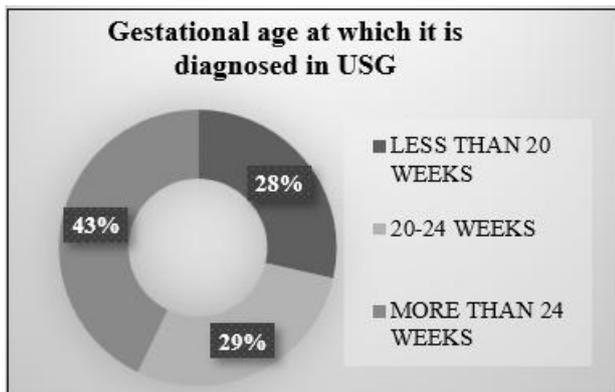
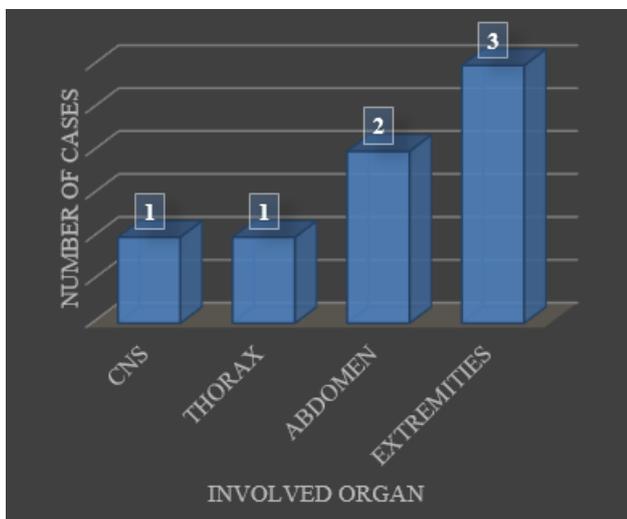


Chart (2): Demonstrating gestational age at which fetal tumors are usually diagnosed on USG



Bar graph (1): Demonstrating distribution of cases according to involved organs

#### 4. Discussion

##### Lymphangioma

Lymphangioma is a rare benign malformation of lymphatic vessels resulting from abnormal embryologic development.

##### Common Locations:

- Posterolateral neck (most common)
- Axilla
- Mediastinum
- Mesentery and retroperitoneum
- Limbs and bones

##### Ultrasound Features:

- Avascular cystic mass
- Thin-walled cysts
- Multiple septations
- Possible echogenic debris if hemorrhage occurs
- May cause compression of adjacent structures

Though benign, large lesions can cause airway obstruction or hydrops fetalis.

##### Arachnoid Cyst

Arachnoid cysts are benign CSF-filled lesions that do not communicate with the ventricular system. They account for approximately 1% of intracranial space-occupying lesions.

##### Typical Features:

- Avascular
- Supratentorial or posterior fossa location
- May cause ventriculomegaly due to obstructive hydrocephalus

##### Prognostic Assessment:

- Presence of associated anomalies
- Ventricular size
- Change in cyst size with gestation

Isolated lesions generally have favorable outcomes. Fetal MRI is useful to exclude associated anomalies such as ACC or cortical malformations.

##### Congenital Pulmonary Airway Malformation (CPAM)

CPAM represents a spectrum of bronchopulmonary foregut malformations characterized by abnormal bronchial proliferation.

According to the Stocker classification, five subtypes exist based on cyst size.

##### Ultrasound Findings:

- Cystic or solid intrathoracic mass
- Mediastinal shift
- Possible hydrops or polyhydramnios
- Identification of feeding vessel

The CVR (CPAM Volume Ratio) helps in prognostication; values <1.6 generally indicate favorable outcomes.

### Management Considerations

Management requires a multidisciplinary team including obstetricians, radiologists, neonatologists, pediatric surgeons, and fetal medicine specialists.

Key considerations include:

- Serial ultrasound monitoring
- Fetal MRI when indicated
- Genetic counseling or amniocentesis if anomalies suspected
- Management of complications (hydrops, polyhydramnios)
- Consideration of intrauterine therapeutic procedures in selected cases
- Delivery planning at tertiary care centre

Decision regarding continuation or termination of pregnancy depends on lesion type, associated anomalies, gestational age, and parental counseling.

### 5. Conclusions

Antenatal ultrasound remains the cornerstone for early detection and characterization of fetal tumors. Accurate lesion identification, assessment of vascularity and mass effect, and recognition of associated anomalies are critical for prognostication and management planning.

Timely diagnosis facilitates appropriate counseling, referral, and multidisciplinary care, thereby improving perinatal outcomes.

**Conflicts of Interest:** There are no conflicts of interest.

### References

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