

Non-Visualization of Fetal Gallbladder: Clinical Implications and Prognosis

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BACKGROUND & OBJECTIVES

- Guidelines Context:** Gallbladder scanning is not a mandatory requirement under current international (ISUOG) "basic" mid-trimester guidelines.
- Clinical Spectrum:** Non-visualization of fetal gallbladder (NVFGB) can be an isolated anatomical variant with normal outcomes or an indicator of severe underlying pathologies, including **Biliary Atresia (BA)** or **Cystic Fibrosis (CF)**.
- Biochemical Marker:** Analysis of amniotic fluid digestive enzymes (AF-DE), particularly **Gamma-Glutamyl Transferase (GGT)**, serves as a marker for digestive tract maturation and patency.
- Study Objective:** To assess postnatal outcomes and evaluate the diagnostic utility of AF-DE testing performed via amniocentesis in fetuses diagnosed with NVFGB.

METHODS

- Study Design:** Single-center retrospective cohort study (2013–2025) conducted at a tertiary Prenatal Hepatology Consult Clinic.
- Study Population:** Cohort of **107 cases** of NVFGB.
- Evaluation:** Cases were stratified according to performance of amniocentesis for AF-DE testing and enzyme percentiles (GGT levels). Prenatal imaging evolution, postnatal sonography, neonatal health, and disease status were systematically compared across groups.

RESULTS: RISK STRATIFICATION BY AF-DE

107

TOTAL COHORT

92.4%

HEALTHY POPULATION

7.6%

SERIOUS DISEASE

AF-DE Subgroup	n	Healthy (%)	Serious Disease (%)
Normal Enzymes	72	100% (72/72)	0% (0/72)
Low (<1st percentile)	8	37.5% (3/8)*	62.5% (5/8)
Borderline (5th %)	1	100% (1/1)	0% (0/1)
Non-AF-DE (Known)	21	81.0% (17/21)	19.0% (4/21)

• Low AF-DE Pathologies (n=5): 3 Biliary Atresia (TOP+PM), 2 Alagille Syndrome (*1 infant had transient bowel obstruction, later healthy).

• Non-AF-DE Group Pathologies (n=4): 2 Biliary Atresia (9.5%), 1 Biliary Cyst (4.8%), 1 Multiple Anomalies (4.8%).

CONCLUSIONS

- Favorable Baseline Prognosis:** Non-visualization of the fetal gallbladder most often results in a healthy postnatal outcome (**92.4% overall healthy**).
- Powerful Prognostic Tool:** AF-DE testing via amniocentesis is highly effective; normal enzyme levels effectively rule out serious disease (**0% risk** in our cohort).
- High-Risk Identification:** Low AF-DE levels (below 1st percentile) identify a high-risk group (**62.5% risk**) for serious pathology such as Biliary Atresia or Alagille Syndrome, necessitating close postnatal follow-up.

ULTRASOUND FINDINGS & EVOLUTION

Prenatal Evolution (N=107):

- Late Gestation Visualization:** 8.4% (9/107) were visualized late in pregnancy.
- Persistent True NVFGB:** 91.6% (98/107) stayed as true persistent NVFGB.

Postnatal US Findings (n=45/98 Persistent):

Postnatal Morphology	n	%
True Agenesis	13	28.9%
Septated Gallbladder	11	24.4%
Normal Gallbladder	10	22.2%
Rudimentary Gallbladder	8	17.8%
Cystic Gallbladder	3	6.7%

★ KEY NOVEL TAKEAWAY

Normal AF-DE enzymes provide 100% negative predictive value for serious disease (0% risk).

Conversely, **low AF-DE levels (<1st percentile) carry a 62.5% risk** of severe biliary or genetic pathology, enabling targeted prenatal counseling and immediate postnatal intervention.