

Spontaneous resolution of isolated fetal nuchal cystic hygroma in an advanced-age IVF pregnancy

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Case Report

Keywords: advanced maternal age, assisted reproductive technology, IVF, nuchal cystic hygroma, prenatal ultrasound, spontaneous resolution

Posted Date: June 17th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-9653880/v1>

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Additional Declarations: No competing interests reported.

Abstract

Background: Fetal nuchal cystic hygroma represents a common embryonic lymphatic malformation identified in early gestation and is strongly correlated with chromosomal aberrations and adverse pregnancy outcomes. Advanced-age pregnancies conceived through in vitro fertilization (IVF) carry elevated gestational risks. Spontaneous complete late-gestation regression of septated nuchal hygroma remains a rarely documented clinical phenomenon in high-risk IVF pregnancies.

Case presentation: This report describes a 40-year-old multiparous woman with a singleton pregnancy achieved via intracytoplasmic sperm injection and frozen blastocyst transfer. At 12+4 weeks of gestation, ultrasound examination revealed honeycomb-septated nuchal cystic hygroma with a nuchal translucency (NT) of 4.5 mm, which increased to 5.2 mm one week later. Invasive genetic testing confirmed a normal fetal karyotype without pathogenic copy number variations. Serial prenatal ultrasound monitoring demonstrated gradual regression of the cystic lesion, which disappeared completely at 36+3 weeks of gestation. The patient delivered a healthy male neonate at 39 weeks of gestation. The infant exhibited normal physical growth and neurological development during the six-month postnatal follow-up.

Discussion: This case indicates that isolated septated nuchal hygroma with confirmed normal genetics may undergo spontaneous intrauterine resolution in late gestation, even among advanced-age IVF pregnancies. Fetal genetic status, rather than ultrasonic morphological characteristics, serves as the decisive prognostic factor. Continuous ultrasound surveillance combined with expectant management is safe and feasible for such clinical cases.

Conclusion: Genetically normal honeycomb-septated nuchal hygroma can achieve complete spontaneous resolution in late gestation in advanced-age IVF pregnancies. Individualized prenatal monitoring and conservative management may reduce unnecessary pregnancy termination and optimize perinatal outcomes.

Background

Fetal nuchal cystic hygroma is a congenital lymphatic system malformation with a first-trimester incidence of 1/600 to 1/1000. Septated cystic hygroma is defined as a high-risk prenatal ultrasonic marker that is frequently associated with chromosomal abnormalities, fetal hydrops, and structural malformations. A previous cohort study including 294 fetuses with cystic hygroma reported genetic anomalies in 64% of cases, while one-quarter of genetically normal fetuses presented additional structural defects. Non-invasive prenatal testing cannot completely exclude the risk of fetal aneuploidy.

Advanced maternal age and IVF conception are independent adverse factors affecting pregnancy prognosis, often inducing parental anxiety and unnecessary termination of pregnancy in routine clinical practice. Simple nuchal cystic lesions usually regress spontaneously during the second trimester. In contrast, late complete resolution of honeycomb-septated hygroma beyond 36 weeks is rarely reported

in IVF pregnancies, and relevant clinical experience remains limited. This case report aims to enrich clinical evidence regarding the prenatal management of isolated septated nuchal hygroma in high-risk IVF pregnancies.

Case presentation

A 40-year-old multiparous patient (G3P2) achieved pregnancy via intracytoplasmic sperm injection and frozen blastocyst transfer. Both parents had normal peripheral blood karyotypes. The patient had no chronic diseases, gestational infections, teratogen exposure, or adverse obstetric history.

Transabdominal ultrasound at 12 + 4 weeks of gestation detected honeycomb-septated nuchal hygroma with an NT value of 4.5 mm. One week later, the cystic lesion progressed with NT increased to 5.2 mm. Persistent nuchal thickening of 7.0 mm was observed at 15 + 4 weeks. Amniocentesis performed at 18 weeks yielded a normal male karyotype (46, XY), and no pathogenic copy number variations were detected.

Serial prenatal ultrasound examinations were conducted throughout gestation. At 22 + 3 weeks, residual nuchal cystic changes and an isolated left ventricular hyperechoic focus were identified without additional structural malformations. The lesion remained stable until 26 + 3 weeks and began to regress gradually from 32 + 3 weeks onward. Complete disappearance of the nuchal hygroma was confirmed at 36 + 3 weeks of gestation (Fig. 1).

Figure presentation

The patient underwent uncomplicated vaginal delivery at 39 weeks of gestation. The male newborn weighed 3400 g, with Apgar scores of 10 at 1 min and 5 min. Postnatal physical examination revealed no congenital malformations. Six-month outpatient follow-up confirmed normal physical growth and neurological development without developmental abnormalities.

Discussion

Fetal nuchal cystic hygroma originates from embryonic lymphatic drainage dysfunction, resulting in subcutaneous fluid accumulation in the fetal cervical region. Septated cysts, increased nuchal translucency, and persistent nuchal thickening are traditionally regarded as poor prognostic indicators, which may lead to elective termination, especially in advanced-age IVF pregnancies. Previous studies have demonstrated that fetuses with cystic hygroma and NT ≥ 4.03 mm have an increased risk of adverse perinatal outcomes. Chromosome microarray analysis and whole-exome sequencing have been widely applied for precise prenatal genetic diagnosis. Compared with isolated NT thickening, cystic hygroma is correlated with a higher incidence of adverse gestational events.

Clinically, septated nuchal hygroma is considered unlikely to regress in late gestation and is commonly associated with unfavorable fetal prognosis. Nevertheless, the present case proves that genetically

confirmed honeycomb-septated hygroma can achieve complete late intrauterine resolution even in high-risk IVF pregnancies. Fetal genetic status exerts a more decisive influence on pregnancy prognosis than ultrasonic morphological manifestations. First-trimester detected cystic hygroma necessitates standardized genetic assessment and long-term prenatal surveillance.

For advanced-age IVF pregnancies complicated with isolated cystic hygroma without fetal hydrops or structural malformations, invasive genetic testing is essential to exclude genetic defects. Once chromosomal abnormalities are ruled out, continuous ultrasound monitoring and expectant management are clinically safe. A long-term retrospective study covering 405 fetuses with cystic hygroma verified that genetically normal isolated hygroma frequently resolves spontaneously with favorable neonatal outcomes. Standardized prenatal follow-up can avoid unnecessary medical intervention, alleviate parental anxiety, and improve overall perinatal prognosis.

Conclusions

Genetically normal honeycomb-septated nuchal cystic hygroma can achieve complete spontaneous resolution in late gestation among advanced-age IVF pregnancies. Standardized prenatal ultrasound surveillance combined with individualized expectant management is a reliable clinical strategy to ensure favorable maternal and neonatal long-term outcomes.

Declarations

Ethics approval and consent to participate

This case report was conducted in accordance with the Declaration of Helsinki. Ethical approval was waived by the institutional ethics committee due to its retrospective nature and fully anonymized clinical data. Written informed consent was obtained from the patient for manuscript publication and relevant ultrasonic image release.

Consent for publication

Written informed consent was obtained from the participant for publishing this case report and all associated images. All personal identifiable information was completely anonymized to protect patient privacy. The signed consent form is securely stored in the hospital medical record system.

Author contributions

ZYZ: Literature collection, data sorting, manuscript drafting and revision. **XFG:** Ultrasound examination, image collection and clinical observation. **QW:** Study design, genetic counseling, manuscript review and supervision. All authors have read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

Funding

No funding was received for this study.

Data availability

The datasets generated and analysed during the current study are not publicly available due to patient privacy restrictions. Anonymized raw data are available from the corresponding author on reasonable request.

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Figures

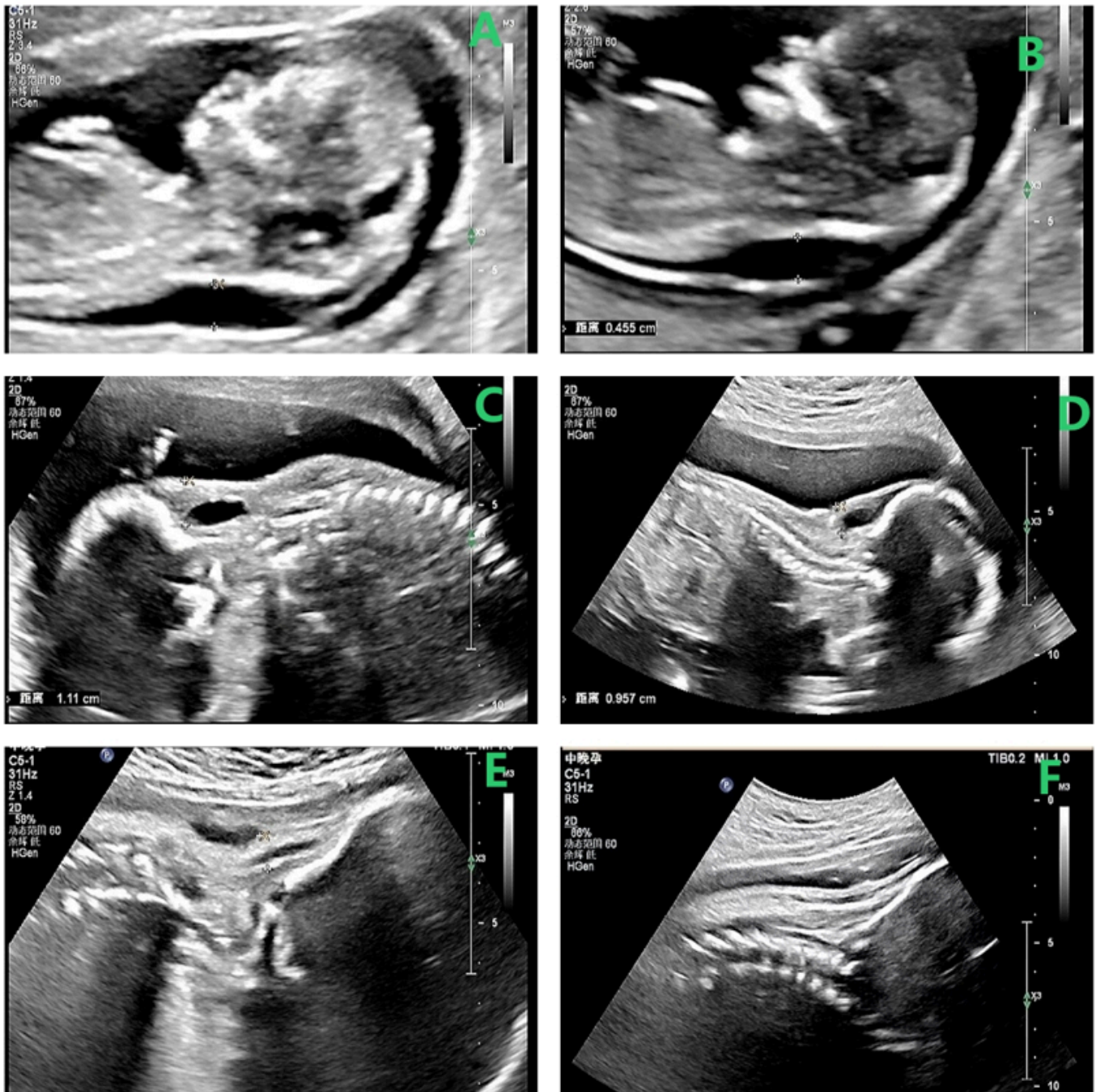


Figure 1

Serial ultrasound images showing dynamic morphological changes and complete spontaneous resolution of fetal honeycomb-septated nuchal cystic hygroma during gestation. (A) 12+4 weeks: Initial septated nuchal lesion with NT = 4.5 mm; (B) 13+1 weeks: Progressive enlargement with NT = 5.2 mm; (C) 15+4 weeks: Persistent nuchal thickening; (D) 22+3 weeks: Residual cystic changes; (E) 32+3 weeks: Significant lesion regression; (F) 36+3 weeks: Complete intrauterine resolution.