



# Diagnostic Yield of Fetal Echocardiography Following Normal Detailed Anatomy Ultrasound for In Vitro Fertilization Pregnancies

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## Introduction

- In vitro fertilization (IVF) pregnancies have historically been considered at increased risk for congenital heart disease (CHD), prompting routine referral for fetal echocardiography even after a normal detailed anatomy ultrasound.
- Maternal-fetal medicine (MFM) sonographers who are echocardiography-certified increasingly perform dedicated cardiac views as part of the detailed anatomic survey.
- The incremental diagnostic value of routine fetal echocardiography referral for IVF conception alone, beyond a normal detailed anatomy ultrasound, has not been well established.
- Understanding this diagnostic yield is important given the added cost, time burden, and patient anxiety associated with routine echo referral.

## Objectives

- To evaluate the diagnostic yield of fetal echocardiography after a normal detailed anatomy ultrasound performed by echo-certified MFM sonographers, in IVF pregnancies without additional risk factors for congenital heart disease.
- To characterize the nature and clinical significance of any additional cardiac findings identified on fetal echocardiography.
- To assess whether these findings support reconsidering IVF conception alone as an indication for routine fetal echocardiography referral.

## Materials and Methods

- Retrospective cohort study of IVF pregnancies at a tertiary MFM practice, 2020–2025.
- Eligible: normal detailed anatomy ultrasound performed by echo-certified MFM sonographers; referred for fetal echocardiography based on IVF conception alone.
- Excluded: additional risk factors for congenital heart disease or abnormal anatomic findings on ultrasound.
- Detailed anatomy ultrasound and fetal echocardiogram reports reviewed for concordance.
- Primary outcome: concordance rate between detailed ultrasound and echocardiogram, and characteristics of any discordant echocardiographic findings.

## Results

Table 1. Clinical and Obstetric Characteristics

| Variable                            | N = 378           |
|-------------------------------------|-------------------|
| Maternal age, years, median [IQR]   | 31 [33, 39]       |
| Advanced maternal age               | 245 (64.8%)       |
| Nulliparity                         | 240 (63.4%)       |
| BMI (kg/m²), median [IQR]           | 23.6 [26.8, 36.0] |
| Race / Ethnicity                    |                   |
| White                               | 114 (30.2%)       |
| Hispanic                            | 15 (3.9%)         |
| Black                               | 19 (5.0%)         |
| Asian                               | 68 (18.0%)        |
| Unknown                             | 176 (46.6%)       |
| Insurance / Payor type              |                   |
| Private                             | 364 (96.3%)       |
| Self-pay                            | 8 (2.1%)          |
| Public                              | 1 (0.2%)          |
| GA at detailed anatomy US, weeks    | 20 [19, 21]       |
| GA at initial echocardiogram, weeks | 24 [23, 25]       |

Figure 1. Flow Diagram

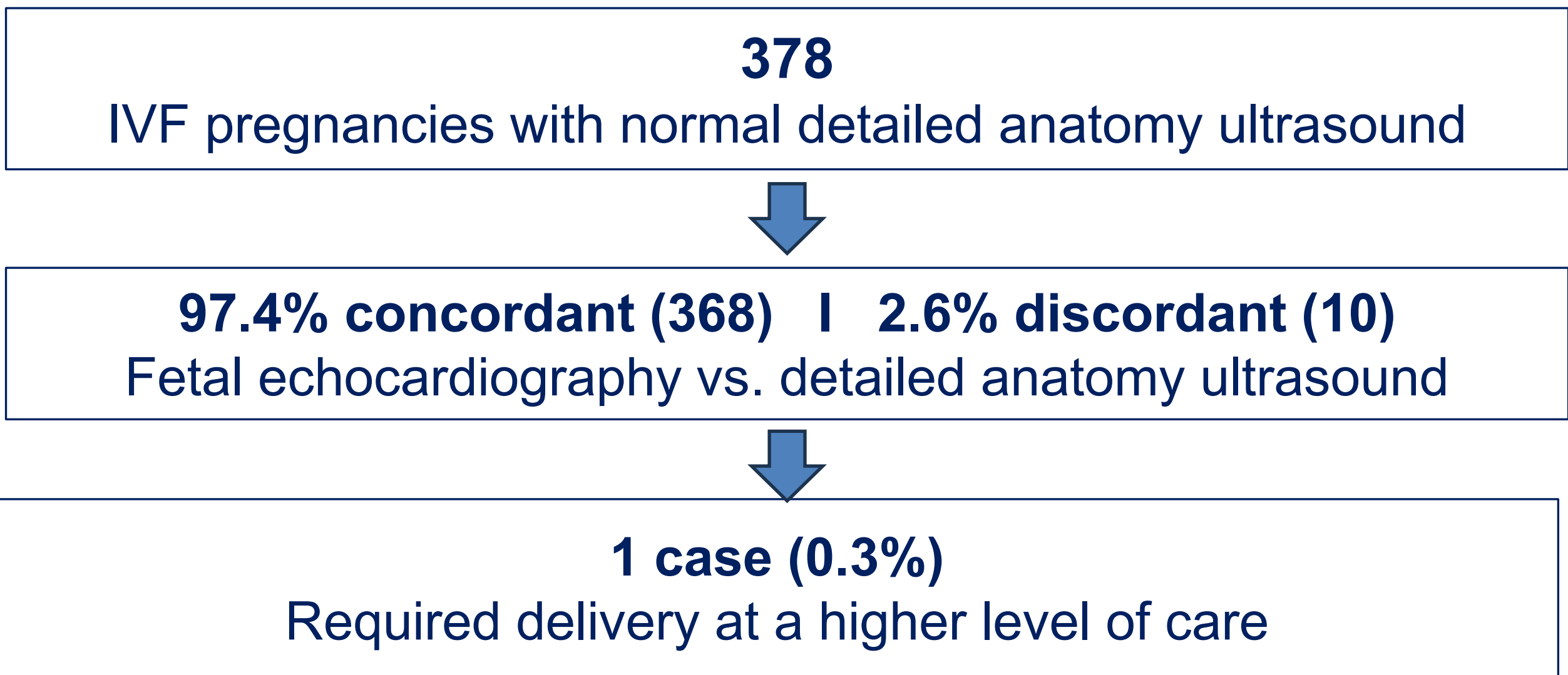


Table 2. Discordant Findings on Fetal Echocardiography Following Normal Detailed Anatomy Ultrasound

| Case | Fetal Echocardiography Finding                       | Postnatal Recommendation               |
|------|------------------------------------------------------|----------------------------------------|
| 1    | Perimembranous / high muscular VSD                   | Postnatal echo                         |
| 2    | Small muscular VSD                                   | Postnatal echo                         |
| 3    | Aortic isthmus with diastolic flow persistence       | Postnatal echo                         |
| 4    | Small LV outpouching                                 | Postnatal echo                         |
| 5    | Mild RV hypertrophy                                  | Postnatal echo                         |
| 6    | Aneurysmal atrial septum bowing into the left atrium | Routine evaluation                     |
| 7    | Increased velocity in the PDA                        | Routine evaluation                     |
| 8    | Increased velocity in the PDA                        | Routine evaluation                     |
| 9    | Increased velocity in the PDA                        | Routine evaluation                     |
| 10   | Concern for coarctation of the aorta                 | Level 3 NICU, ductal arch surveillance |

## Conclusions

- A normal detailed anatomy ultrasound performed by echo-certified sonographers demonstrates high concordance with fetal echocardiography.
- Discordant findings may have benefited from greater gestational age at echocardiogram.
- Routine referral for fetal echocardiography in tertiary MFM practices may offer limited additional diagnostic value while increasing cost, time burden, and patient anxiety.
- These findings support reconsideration of IVF conception alone as an indication for fetal echocardiography.
- Future prospective studies should assess concordance with postnatal echocardiographic findings, evaluate cost-effectiveness, and further explore patient perspectives.