

Agenesis of the Ductus Venosus: The Clinical Significance of Umbilical Portal-Systemic Venous Shunt Status

Hanoch Schreiber^{1,2}, Lior Drukker^{1,2}, Dana Brabbing^{2,3}, Yael Mozer Glassberg^{2,4}, Asaf Romano^{1,2}, Yossi Geron^{1,2}, Ron Charach^{1,2}, Miriam Lopian^{1,2}, Yinon Gilboa^{1,2}, Ron Bardin^{1,2}

¹ Department of Obstetrics and Gynecology, Helen Schneider Women's Hospital, Rabin Medical Center–Beilinson Hospital, Petah Tikva, Israel

² Gray Faculty of Medical and Health Sciences, Tel Aviv University, Tel Aviv, Israel

³ Raphael Recanati Genetic Institute, Rabin Medical Center–Beilinson Hospital, Petah Tikva, Israel

⁴ Institute of Pediatric Gastroenterology, Nutrition and Liver Diseases, Schneider Children's Medical Center of Israel, Petah Tikva, Israel

BACKGROUND & OBJECTIVE

Agenesis of the ductus venosus (ADV) is a rare fetal vascular anomaly. In ADV, placental venous return may be accommodated through alternative pathways, including an umbilical portal systemic venous shunt (UPSVS).

Objective: To compare prenatal findings, genetic evaluation and pregnancy outcomes in fetuses with ADV with versus without an associated UPSVS.

METHODS

Single-center retrospective cohort study of 67 fetuses with prenatally diagnosed ADV, evaluated at a tertiary referral center between 2013 and 2025. Cases were stratified according to the presence or absence of an associated UPSVS after repeated targeted ultrasound assessment of the portal venous system. Fetal growth, hemodynamic findings, structural anomalies, genetic testing and pregnancy outcomes were compared between groups.

COHORT SUMMARY

67 fetuses with ADV



No UPSVS
40/67
(59.7%)

UPSVS present
27/67
(40.3%)

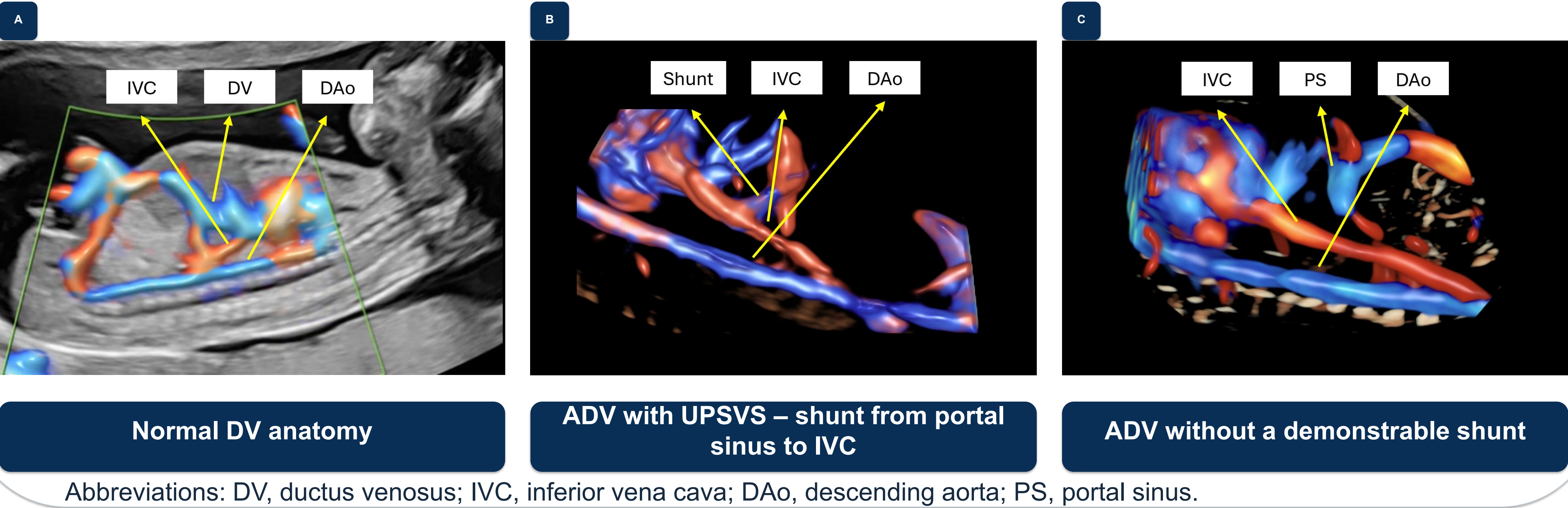
KEY RESULTS

	No UPSVS (n=40)	UPSVS (n=27)	P value
1 No demonstrable shunt was more common than UPSVS	59.7%	40.3%	-
2 Fetal growth restriction	19.4%	55.0%	P=0.015
3 Increased TAPSE	0%	80%	P<0.001
4 Signs of cardiac volume overload	0%	80%	P<0.001
5 Structural anomalies	25.0%	25.9%	P=0.623
6 Any abnormal genetic result among tested cases	15.2%	21.4%	P=0.66

Overall, genetic testing was performed in 47/67 pregnancies (70.1%); abnormal cytogenetic findings were identified in 8.7%, and pathogenic exome variants in 21.1% of those tested.

Hydrops or IUFD occurred only in the UPSVS group: 2/27 (7.4%).

IMAGING



CONCLUSIONS

- ADV without a demonstrable UPSVS may represent a distinct, generally lower-risk phenotype.
- ADV with UPSVS is associated with adverse hemodynamic and growth outcomes.
- Comprehensive portal venous and genetic evaluation should be considered in all cases of ADV, as clinically significant genomic abnormalities may occur even without structural anomalies.

Key novel observation: 59.7% of fetuses had ADV without a demonstrable UPSVS despite repeated targeted venous assessment.