

Online Supplemental Data

Supplemental Table 1:

Refined Neuroimaging Criteria to differentiate Dandy-Walker Malformation, inferior vermian hypoplasia, vermian hypoplasia, Blake's pouch cyst, and vermian hypoplasia with Blake's pouch cyst

Diagnosis	Vermis	TVA	Fastigial recess	Tail sign	TTC/CP
Dandy Walker Malformation (DWM)	IVH	Increased	Obtuse	Present	Down & Out
Inferior Vermian Hypoplasia (IVH)	IVH	Normal	Acute	Absent	Up & In
Vermian Hypoplasia (VH)	DVH	Normal	Acute	Absent	Up & In
Blake's Pouch Cyst (BPC)	Normal	Increased	Acute*	Absent*	Up & In*
Vermian Hypoplasia + _Blake's Pouch Cyst (VH + BPC)	VH	Increased	Acute*	Absent*	Up & In*

DVH=diffuse vermian hypoplasia (not inferiorly predominant), Down=inferiorly displaced, In=medially directed, Out=laterally displaced, TTC/CP=taenia-tela choroidea complex/choroid plexus location, TVA=tegmentovermian angle, Up=cranially directed, *most common but can be variable on fetal MRI.

Supplemental Table 2: Traditional versus Refined Neuroimaging Criteria for the diagnosis of DWM

Diagnostic Criteria	Vermis	TVA	Fastigial recess	Tail sign	TTC/CP	Posterior Fossa	Torcular
Traditional	VH	Increased	NA	NA	NA	Enlarged	Elevated
Refined	IVH	Increased	Obtuse	Present	Down & Out	Variable	Variable

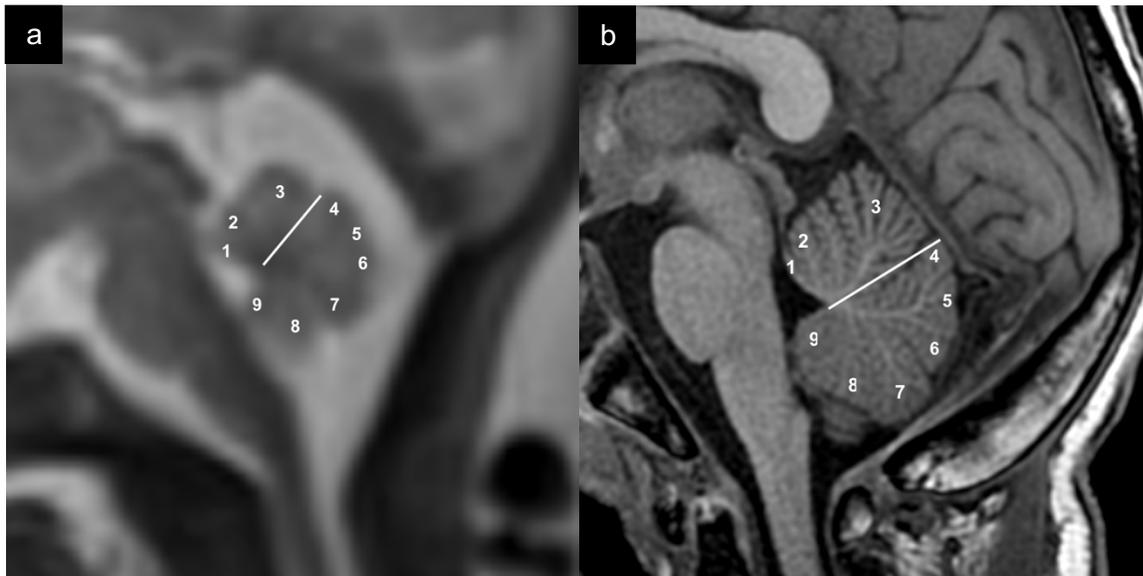
Down=inferiorly displaced, IVH=inferior vermian hypoplasia, Out=laterally displaced, TTC/CP=taenia-tela choroidea complex/choroid plexus location, TVA=tegmentovermian angle, VH=vermian hypoplasia

Supplemental Table 3: Fetal and Postnatal Brain MRI variables differentiating DWM from non-DWM

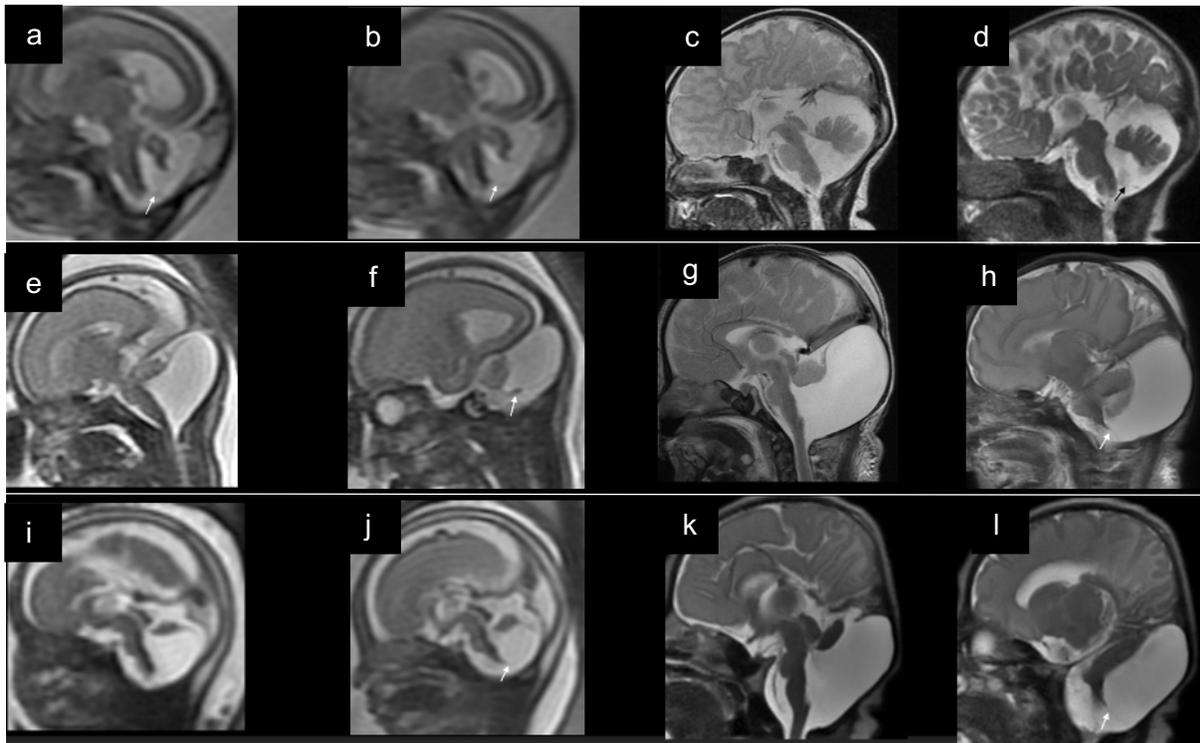
	Prenatal (n=174)	Postnatal (n=272)
Vermian Height	p=0.235	p<0.001
Vermian AP Dimension	p=0.004	p<0.001
Vermian Lobule Number	p<0.001	p<0.001
Vermian Ratio	p<0.001	p<0.001
Fastigial Angle	p<0.001	p<0.001
Cisterna Magna Depth	p<0.001	p<0.001
Tegmentovermian Angle	p<0.001	p<0.001
Superior Posterior Fossa Angle	p=0.092	p<0.001
Posterior Fossa Perimeter	p=0.799	p=0.817
Vascular Injury Evidence	p=0.89	p=0.31

Supplemental Figure 1:

Vermian Ratio. Vermian ratio shown on sagittal midline fetal MRI T2WI (a) and postnatal MRI T1WI (b). Vermian ratio is considered abnormal when the collective size of the posterior and central lobes was less than approximately twice the size of the anterior lobe using a line drawn from the fastigial point to the primary fissure

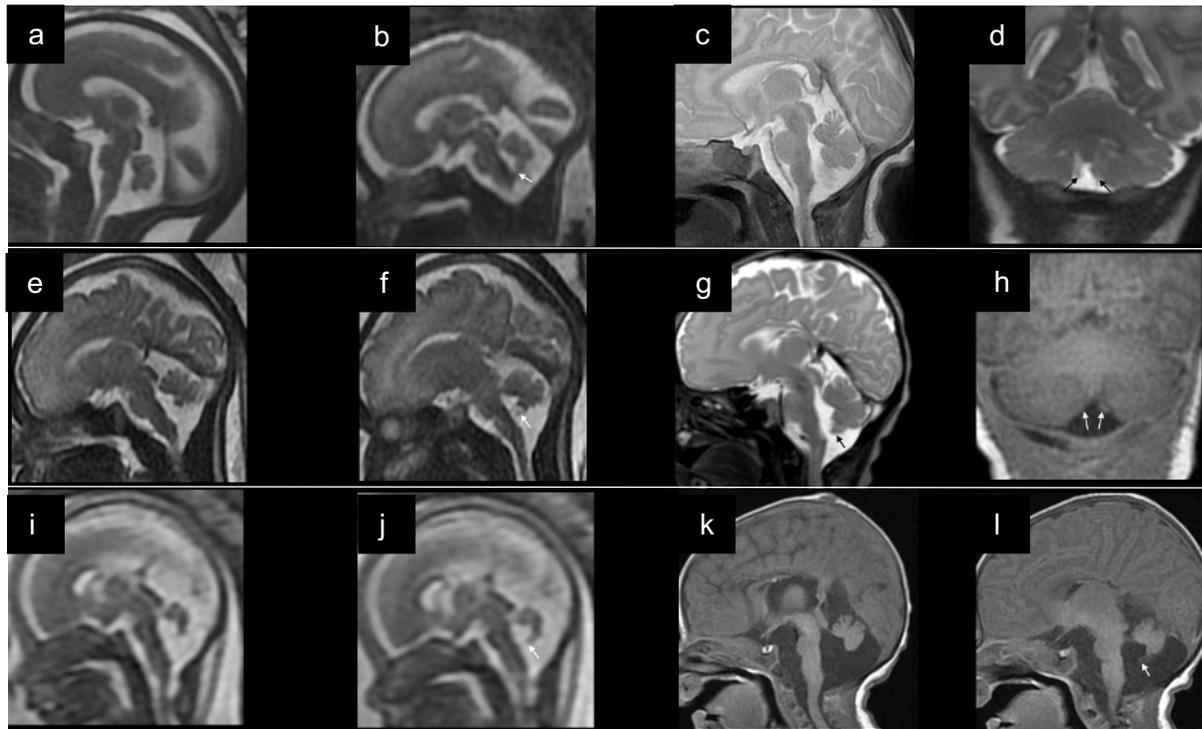


Supplemental Figure 2:



Dandy-Walker malformation: phenotypic range on sagittal T2WI with vermian deficiency/dysgenesis ranging from mild [fetal MRI at 21 weeks GA, a and b; postnatal MRI, c and d (same patient)] to moderate [fetal MRI at 25 weeks GA, e and f; postnatal MRI, g and h (same patient)] to marked [fetal MRI at 26 weeks GA, i and j; postnatal MRI, k and l (same patient)] and variably sized posterior fossae and tegmentovermian angles. TTC and CP are displaced inferolaterally (arrows) and the fastigial angle is variably obtuse in all cases. The tail-sign is only useful when it can be confirmed to represent an unpaired caudal lobule, in which case it is virtually diagnostic; however, the tail-sign may be absent in DWM in some cases (e.g. suboptimal resolution, motion artifact, compression) and present in BPC and BPC + VH on fetal MRI when caused by ectopic location of the choroid plexus and/or rhombic lip. Concurrent corpus callosum abnormalities include agenesis (c and d) and hypogenesis (k and l).

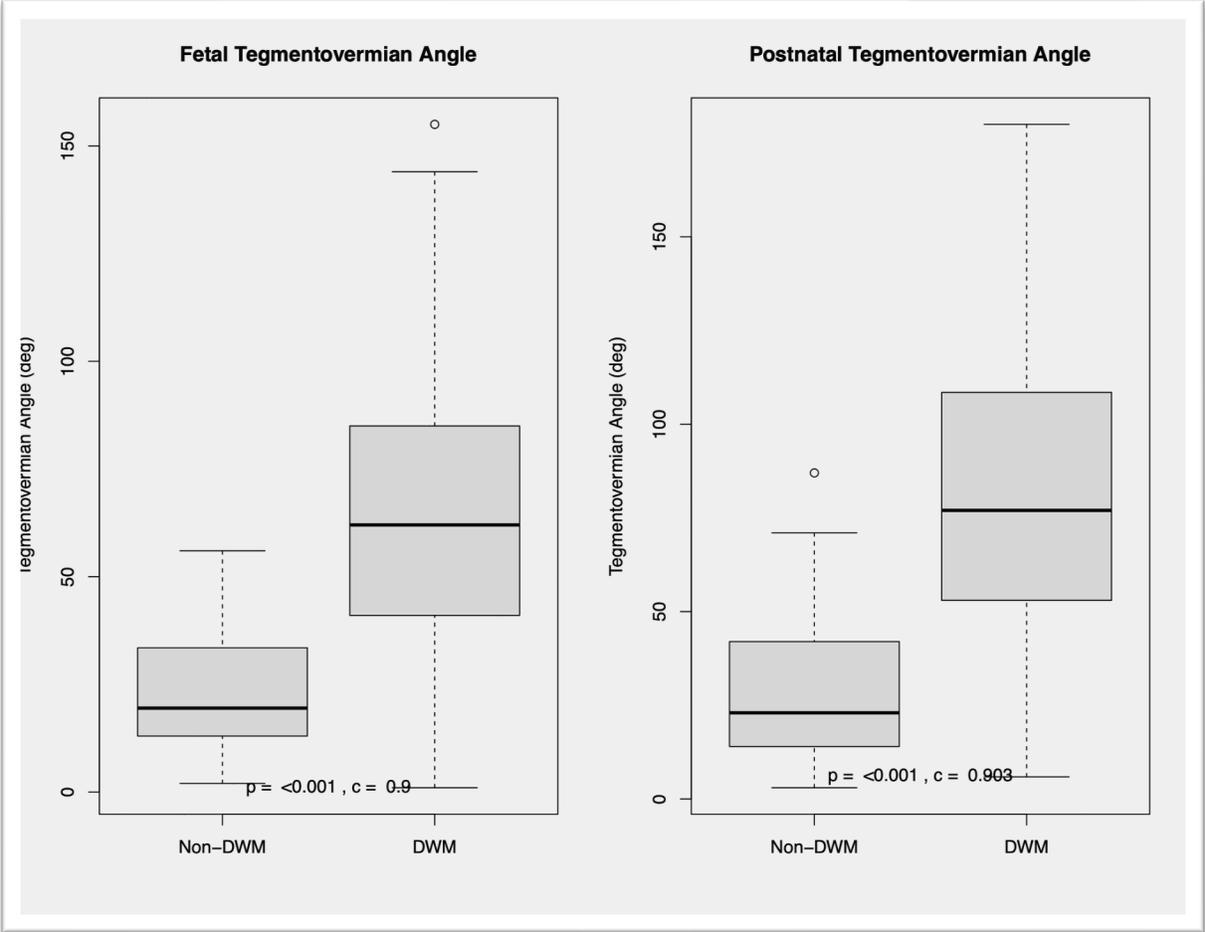
Supplemental Figure 3:



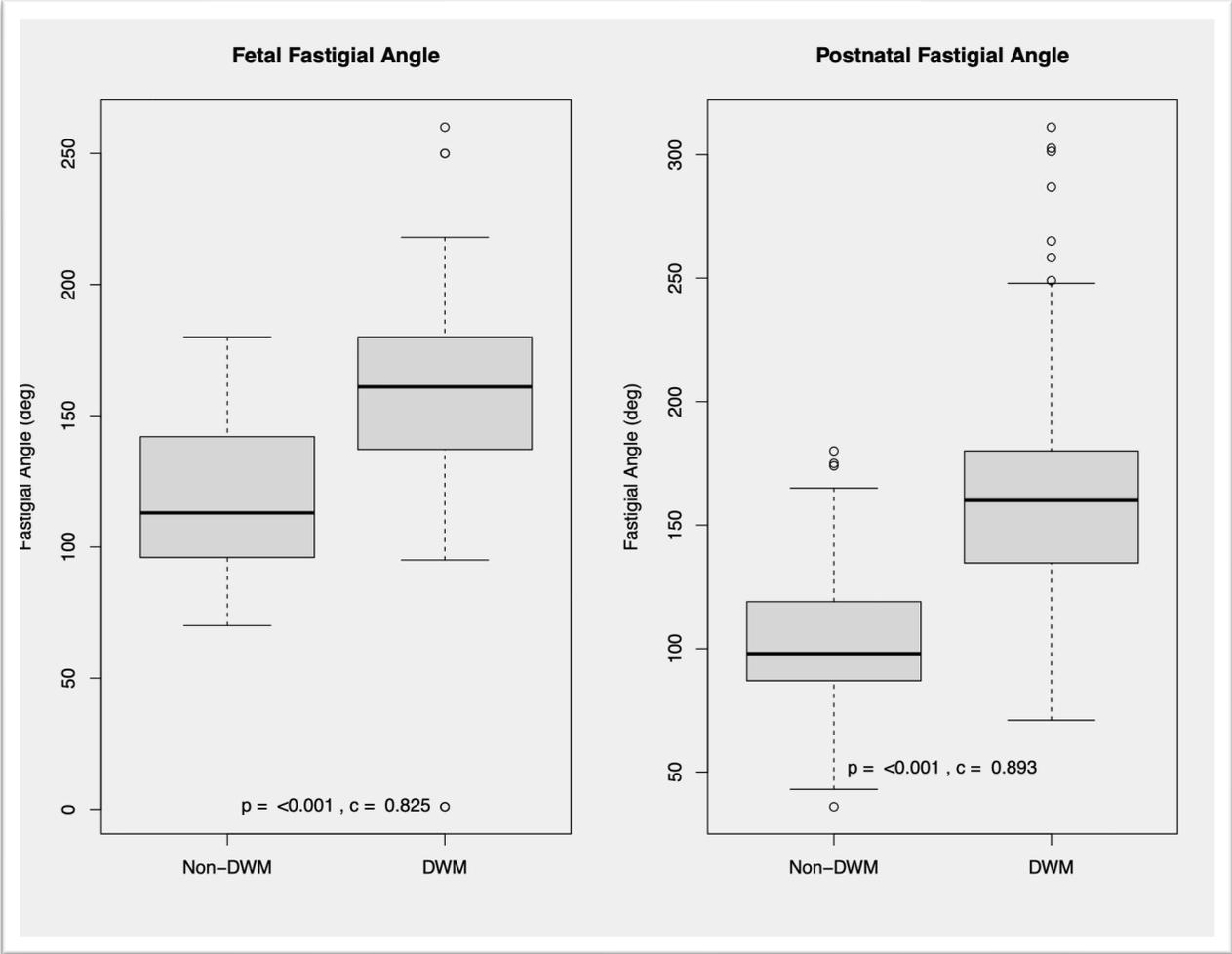
Non-DWM posterior fossa abnormalities on T1WI and T2WI. Blake's pouch cyst [fetal MRI at 28 weeks GA, a and b; postnatal MRI, c and d (same patient)]: the tegmentovermian angle is elevated at 20 degrees (a and c); however, the vermis is otherwise structurally normal - the fastigial recess is sharp, and the taenia-tela choroidea complex and choroid plexus are normally located, extending superomedially along the inferomedial cerebellar undersurface (arrows). Vermian hypoplasia [fetal MRI at 39 weeks GA, e and f; postnatal MRI, g and h (same patient)]: the inferior vermis is hypoplastic with lack of the normal 2:1 posterior to anterior vermis ratio. The fastigial recess is sharp and the taenia-tela choroidea complex and choroid plexus are normally located along the inferomedial cerebellum (arrows). Vermian hypoplasia *and* Blake's pouch cyst: [fetal MRI at 18 weeks GA, i and j; postnatal MRI, k and l (same patient)]: the tegmentovermian angle is elevated, the vermis is hypoplastic, the fastigial recess is sharp, and the taenia-tela choroidea complex and choroid plexus are normally located along the inferomedial cerebellum (arrows).

Supplemental Figure 4:

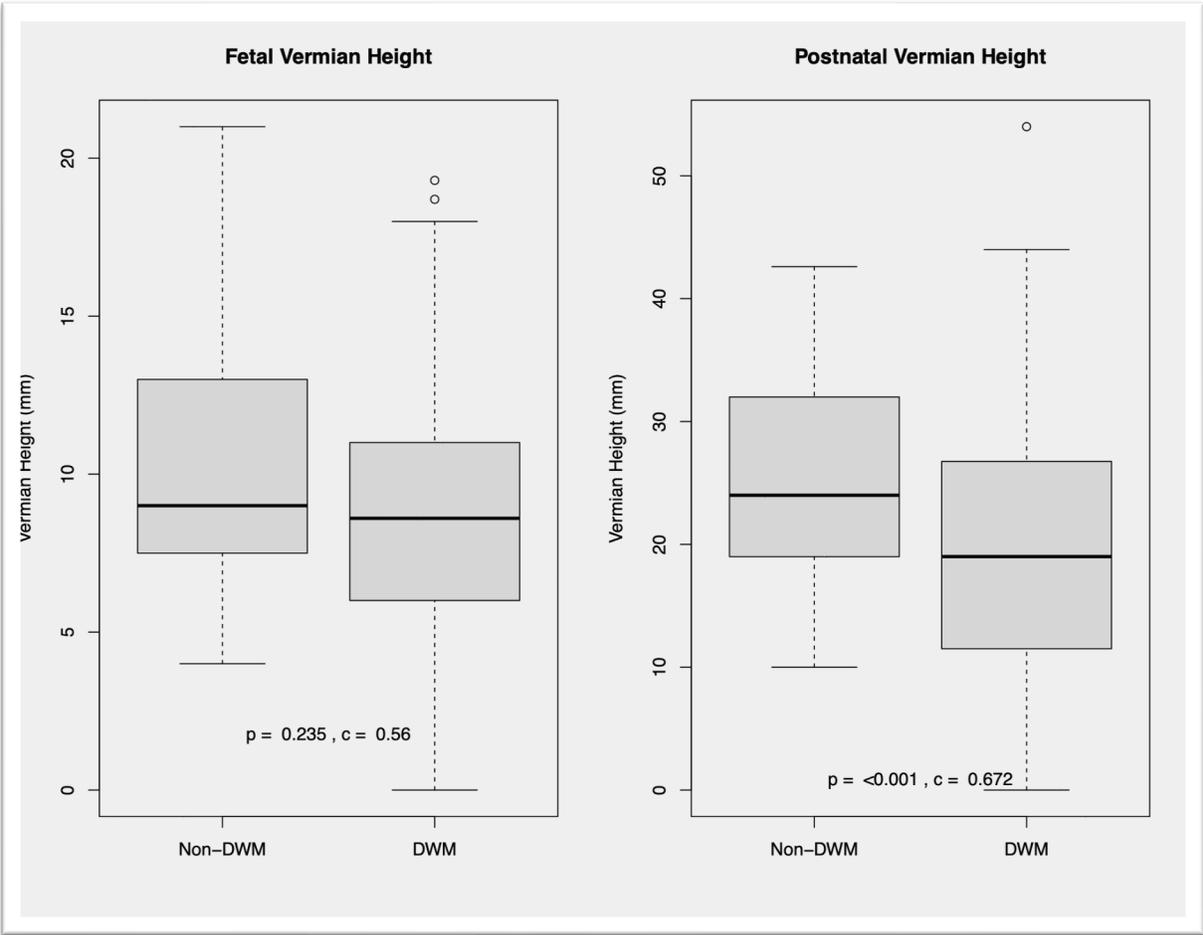
Supplemental Figure 4a:



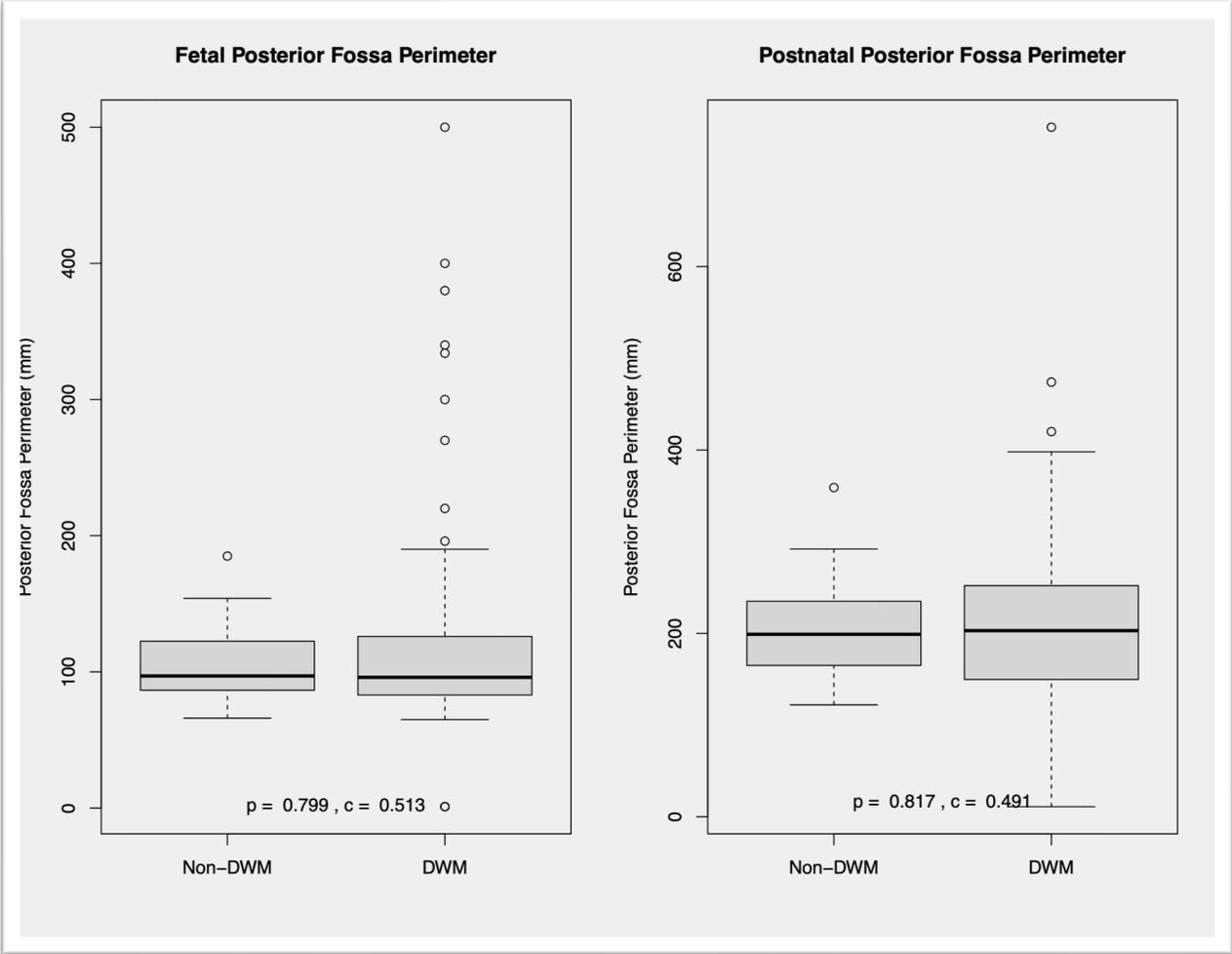
Supplemental Figure 4b:



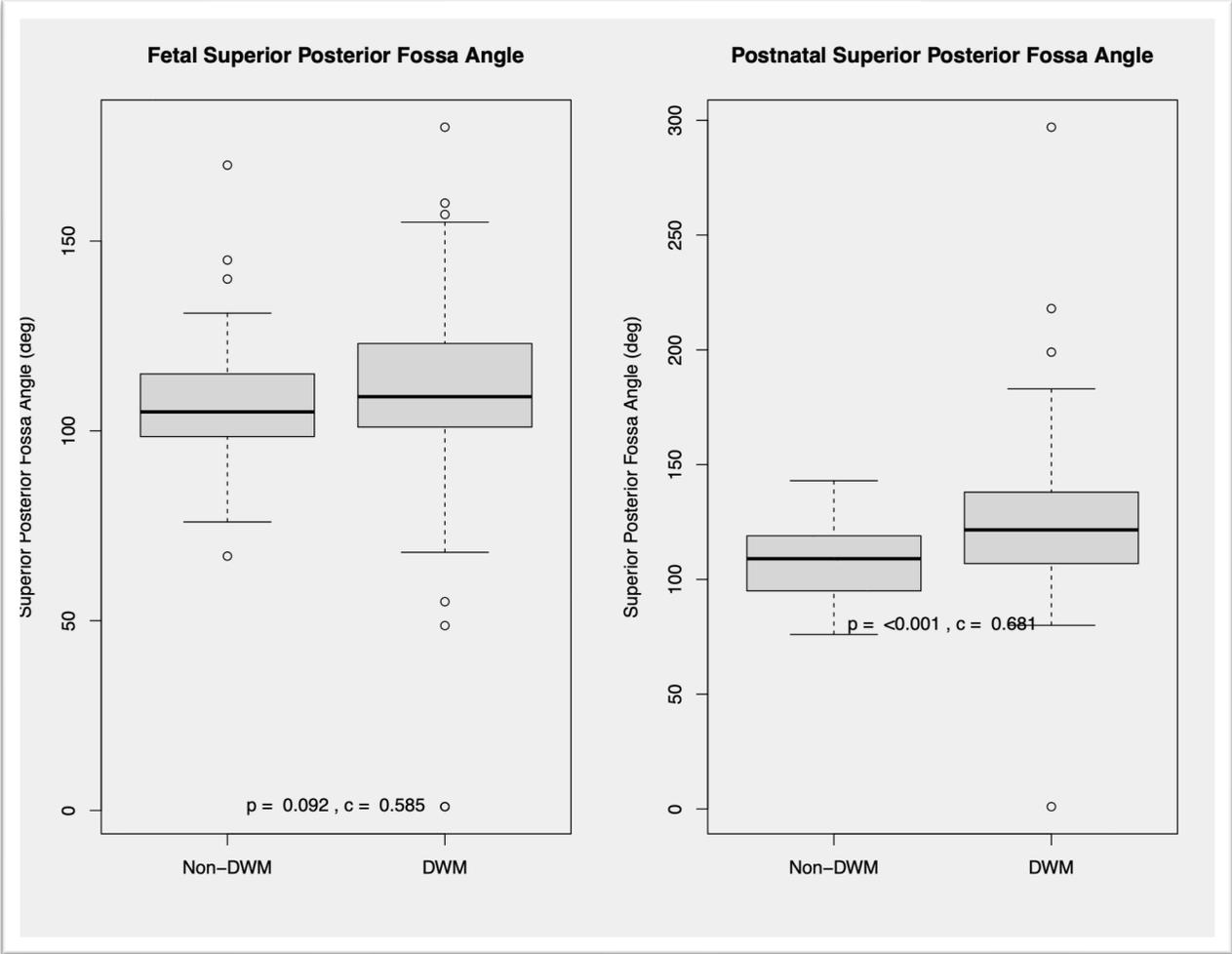
Supplemental Figure 4c:



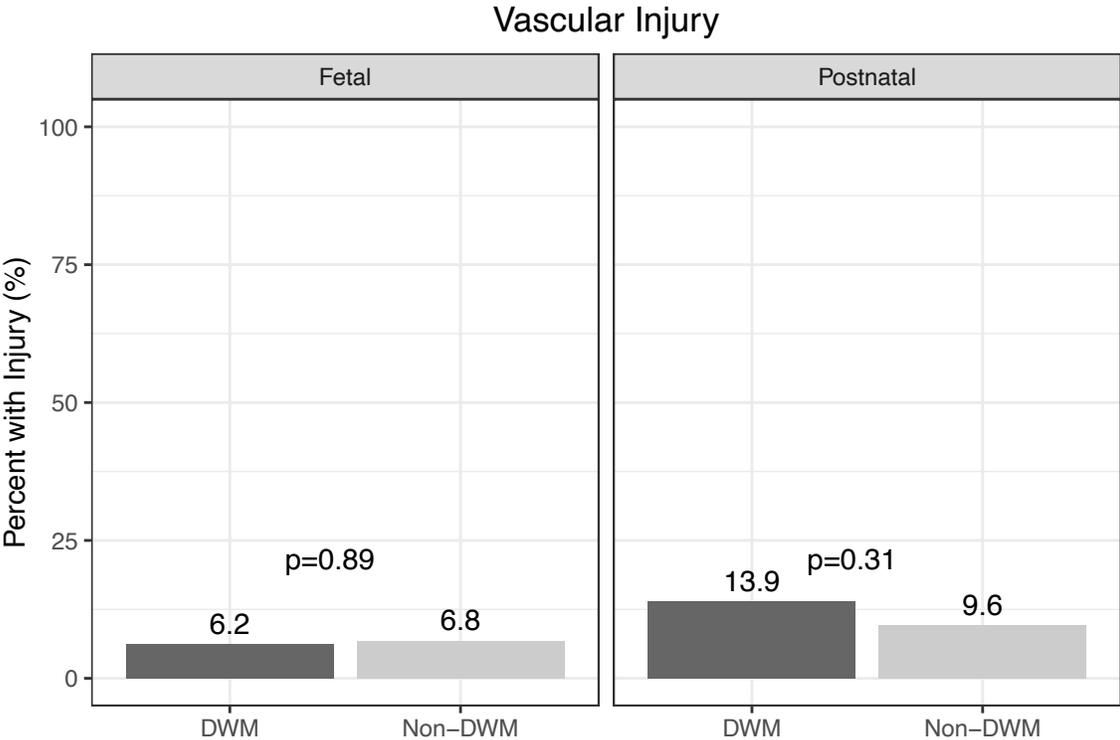
Supplemental Figure 4d:



Supplemental Figure 4e:



Supplemental Figure 4f:



Supplemental Figure 5

Receiver operating characteristic (ROC) curves for the differentiation of DWM from non-DWM using an optimized linear model in prenatal (A) and postnatal (B) cohorts. ROC curves a linear model incorporating age and TVA in prenatal (C) and postnatal (D) cohorts. ROC curve for differentiation of DWM and non-DWM patients using TVA alone resulting in AUC of 0.901 (E).

