

Mid-trimester fetal brain screening by 5 planes for better diagnostic yield

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Objectives Fetal neurological evaluation is always a challenge in mid-trimester. Advanced neurosonogram may need expertise to perform. We wanted to establish methodology of fetal neurological examination for higher detection rate than basic recommended by ISUOG.

Method: We retrospectively analyzed 2,106 patients from 1.1.2023 to 30.06.2025. We modified to trans-ventricular plane, upper trans-cerebellar plane, lower trans-cerebellar plane in axial plane. We added to measure 4th ventricular index and to examine posterior fossa cystic malformation assessment. We added midsagittal plane to evaluate corpus callosum and also posterior fossa for better assessment. We added one coronal plane at the level of thalamus to assess the operculization and germinal matrix.

Results 92 CNS anomalies were detected in the cohort. 4.36% patients were diagnosed. Axial section evaluation diagnosed 63 and suspected additional 15 anomalies. Hydrocephalus, BVM, Acrania, HPE and VGAM were diagnosed on axial section alone. Callosal and posterior fossa were common on suspected group. Adding midsagittal section confirmed Callosal and posterior fossa anomalies, partial ACC, AQ duct stenosis, ponto-cerebellar hypoplasia, septal perforation in septum pellucidum as malformation in 36 patients. (15 anomalies which were confirmed which were suspected in axial evaluation and 21 were only possible to diagnose in midsagittal section. 14 anomalies were diagnosed by coronal section, 5 (6 cases of Absent septum pellucidum (3- isolated ASP2 had SOD and one Pre-septoptic HPE) were suspected by axial section. 9 cases (6 of Malformation of cortical development, 3 IVH grade).

Conclusion: A structured five-plane approach to mid-trimester fetal brain evaluation significantly improves detection. This approach bridges the gap between basic and advanced neurosonography and provides a feasible, high-yield screening strategy for routine mid-trimester fetal brain assessment, particularly in high-volume or referral settings.

