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Commentary

Role of Third Trimester Ultrasound in Diagnosing Fetal Urological Abnormalities

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DESCRIPTION

Urological abnormalities are among the most commonly detected fetal anomalies on antenatal ultrasound, accounting for approximately 1% of all prenatal findings. Traditionally, these abnormalities are diagnosed during the second trimester (T2) anomaly scan, typically performed between 18 and 21 weeks of gestation. With the introduction of routine third trimester (T3) ultrasounds in certain healthcare settings primarily intended to monitor fetal growth and detect small-for-gestational-age fetuses clinicians have increasingly observed that these later scans also identify previously undiagnosed fetal abnormalities, including urological conditions. This evolving practice prompts an important question: does the third trimester scan offer any additional value in diagnosing clinically significant urological anomalies?

A retrospective analysis of 8,554 singleton pregnancies provides valuable insight into this query. All women in this cohort underwent both second and third trimester scans at a tertiary-level Fetal Medicine Unit. The study focused specifically on renal and urinary tract anomalies identified during these scans, tracking outcomes through birth and subsequent pediatric urological care. The data sheds light on the incidence, accuracy, and clinical relevance of urological findings detected at each stage of pregnancy.

The results revealed that the second trimester scan detected 76 urinary tract abnormalities, compared to 26 identified during the third trimester. Postnatal confirmation of these findings demonstrated that 47 of the T2 scan anomalies and 18 of the T3 anomalies represented true urological abnormalities. While the raw numbers suggest that the T2 scan identifies more anomalies, the statistical analysis found no significant difference in the types or severity of abnormalities between the two groups.

Commonly identified conditions across both trimesters included hydronephrosis, duplex kidneys, renal agenesis, multicystic dysplastic kidneys, and pelvic kidneys. Importantly, no substantial differences were found in terms of clinical outcomes, such as the need for antibiotics, urinary tract infections, or surgical interventions. For instance, 17 children in the T2 group and 4 in the T3 group required surgical correction, but this was not statistically significant. Likewise, the need for postnatal antibiotics and incidence of urinary infections did not differ meaningfully between the two groups.

This parity in clinical outcomes underscores a key insight: the timing of detection does not necessarily affect prognosis or the need for intervention. However, the study also highlighted an intriguing counterpoint. A greater proportion of abnormalities identified at the T2 scan resolved spontaneously before birth. In contrast, T3 anomalies were more likely to persist and represent true structural abnormalities. This suggests that T3 scans may have a lower false positive rate compared to earlier scans, enhancing their diagnostic specificity.

The discrepancy in false positive rates may reflect physiological development patterns. For instance, transient hydronephrosis seen during the T2 scan could simply be part of normal fetal renal maturation. Echogenicity and resolution of imaging improve with gestational age, which may partly explain the superior predictive accuracy of the T3 scan. In essence, what appears abnormal at 20 weeks might no longer be evident or concerning at 32 weeks. Moreover, differences in the fetal environment and anatomy throughout gestation affect imaging clarity and interpretation.

The third trimester offers a more developed organ system and may allow for better visualization of kidneys, bladder, and urinary flow, potentially explaining why some previously missed or new-onset abnormalities are only detectable at this later stage. Interestingly, the study also revealed a gender-based pattern in anomaly detection. T2 scans identified more anomalies in male fetuses, while T3 scans detected more in females. The significance of this observation is not fully understood, but it may reflect differences in urinary tract development or simply be a function of sample variability. Nonetheless, it raises questions about the sensitivity of ultrasound to gender-specific developmental timelines.

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CONCLUSION

In conclusion, the utility of the third trimester ultrasound should not be dismissed. As fetal imaging continues to evolve, it may be time to reconsider its role not only in growth assessment but also in late-onset or previously missed structural anomaly detection. A more tailored approach reserving third trimester imaging for cases where risk factors, abnormal findings, or growth concerns exist could be a balanced path forward. Further prospective studies are needed to define the most cost-effective and clinically impactful model for integrating third trimester scans into routine prenatal care.