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abstract

Early Diagnosis of Malignant Tumors in Children: Potential and Limitations of Diagnostic Ultrasound

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Introduction: Early detection of malignant tumors in children significantly improves outcomes, allowing for timely treatment. Visualization Methodology: are fundamental to the diagnostic process, with ultrasound being particularly valued for its availability and safety. The paper examines the role of ultrasound in the early diagnosis of childhood malignant neoplasms, its advantages and limitations.

Methodology: Analysis of current literature in terms of the effectiveness of method, development trends, and analysis of the use of ultrasound as an initial diagnostic step at the outpatient level.

Results: The widespread use of ultrasound in pediatric oncology highlights both opportunities and challenges. Its safety and availability position it as an ideal first-line diagnostic tool, especially in settings where access to specialty care is limited. However, its limitations in evaluation of some malignancies reflect the importance of integrating it into a multimodal diagnostic strategy. The diagnostic algorithm may include: initial ultrasound examination for suspected lesions or unexplained symptoms; referral to pediatric oncologists in cases with suspicious diagnostic ultrasound results; and use of imaging techniques for detailed assessment and staging where indicated.

There are limitations due to the operator dependence of the method and the lack of standardized reporting of ultrasound assessments. Consensus solutions suggest training specialists in specialized centers to improve diagnostic accuracy and the development of standardized protocols for ultrasound diagnostic examination results in pediatric oncology. The introduction of advanced ultrasound technologies (e.g., non-Doppler blood flow imaging and Elastography) into routine practice improves the quality of tumor characterization.

Conclusion: Diagnostic ultrasound plays a key role in the early diagnosis of childhood malignancies due to its effectiveness, availability, and safety. Although it has limitations compared to radiographic imaging, it serves as an important step in identifying cases that require further evaluation. Training of specialists, development of standardized protocols, and implementation of technological advances can improve its diagnostic effectiveness.