

Non-Invasive Assessment Tools for Pediatric Head and Neck Lesions - Ultrasound and 3D Printing

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Superficial palpable masses of the head and neck are common in the pediatric population, with the vast majority of the lesions ultimately proven to be benign. Duplex ultrasonography (US) has emerged as the first-line imaging modality for the evaluation of superficial pediatric masses. Without utilizing radiation, iodinated contrast material, or sedation and/or anesthesia, US provides a means for quick and cost-effective acquisition of information, including the location, size, shape, internal content, and vascularity of the mass. In this review, the US findings are described for a variety of common and uncommon pediatric head and neck masses diagnosed in our practice. Our 10 years experiences in pediatric ultrasound about 1500 cases, US findings is very important in determining the most accurate preoperative diagnosis without exposing the children to unnecessary utilizing ionizing radiation or anesthesia. Three-dimensional (3D) imaging has been available for decades, it has helped to better perceive complex anatomic and pathologic relations. Novel 3D printing technologies can transfer virtual anatomic models into true 3D space and produce both patient-specific models and medical devices. Most of the applications are found in cardiovascular, head and neck, temporal bone model, tracheal stenosis. 3D printed model may provide a realistic model to help participants gain experience with anatomic limitations.