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POSTER SECTIONS

Coverpage

Learning objectives

Background

Findings and procedure details

Conclusion

Personal information and conflict of interest

References

ECR 2026 / C-18873

Abdominal Ultrasound Phantom – A Potential Training Tool

Congress:

ECR 2026

Poster Number:

C-18873

Type:

Educational Exhibit

Keywords:

Abdomen, Radiographers, Ultrasound, Education, Education and training

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DOI:

10.26044/ecr2026/C-18873

DOI-Link:

https://dx.doi.org/10.26044/ecr2026/C-18873

Learning objectives

Purpose and Learning Objectives Purpose The purpose of this educational intervention was to evaluate the effectiveness of abdominal ultrasound phantoms as a simulation-based learning tool in the training of Medical Imaging and Radiology students. Abdominal ultrasonography is a highly operator-dependent modality, yet undergraduate training is often limited by restricted patient access, ethical considerations, and reduced opportunities for supervised practice [3,6]. Simulation-based learning offers a safe and reproducible environment for hands-on training, supporting experiential learning and skill acquisition [3,4].By using a high-fidelity abdominal ultrasound phantom (Kyoto...

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Background

Background and MethodsAbdominal ultrasonography is an essential diagnostic modality but remains highly operator-dependent, requiring well-developed technical, spatial, and interpretative skills. In undergraduate health education, training is frequently constrained by limited patient access, ethical considerations, and reduced opportunities for supervised practice, which may compromise students' preparedness for clinical ultrasound examinations [3,6]. Simulation-based learning, grounded in experiential learning theory, provides a safe and effective alternative by enabling repeated, hands-on practice without risk to patients [3,4].Ultrasound phantoms replicate anatomical structures and tissue echogenicity, allowing learners to practice image...

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Findings and procedure details

The implementation of simulation-based training using the abdominal ultrasound phantom demonstrated positive educational outcomes across technical, cognitive, and affective domains. Comparative analysis of pre- and post-training assessments revealed a substantial improvement in students' theoretical knowledge and practical performance following the supervised simulation sessions.Students showed marked progress in the identification of abdominal anatomical structures and simulated pathological findings across multiple acoustic windows. Post-training results indicated improved accuracy in recognizing organs such as the liver, gallbladder, pancreas, kidneys, and major vascular structures, as well as increased consistency...

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Conclusion

This study demonstrates that simulation-based training using an abdominal ultrasound phantom is an effective and valuable educational strategy in the training of Medical Imaging and Radiology students. The use of a high-fidelity phantom enabled meaningful improvements in anatomical recognition, technical performance, and learner confidence, while providing a safe and controlled environment for repeated practice.The findings support the role of ultrasound phantoms as a complementary tool to traditional teaching methods, particularly in early stages of training where access to patients and supervised clinical practice may be...

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Personal information and conflict of interest

J. Pinheiro: Nothing to disclose A. D. M. Ribeiro: Nothing to disclose L. P. V. Ribeiro: Nothing to disclose

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References

Anand R, Swain BP, Nag DS, Patel R, Gope RL. Do-it-yourself ultrasonography phantom model for improving hand skills: a technical report. Cureus. 2024;16(2):e54750. doi:10.7759/cureus.54750. Fenech M, Burke T, Arnett G, Tanner A, Werder N. Sonographic localisation of lymph nodes suspicious of metastatic breast cancer to surgical axillary levels. J Med Radiat Sci. 2024. doi:10.1002/jmrs.840. Gibbs V. The role of ultrasound simulators in education: an investigation into sonography student experiences and clinical mentor perceptions. Ultrasound. 2015;23(4):204–211. doi:10.1177/1742271X15597343. Kolb DA. Experiential learning: experience as the source of...

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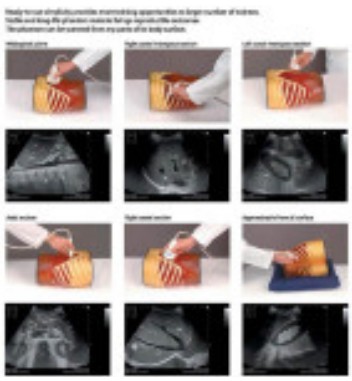

Fig 1: *Examples of Acquisition Planes*

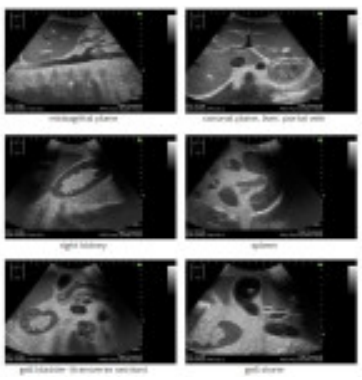

Fig 2: *Anatomical structures and pathologies found in the phantom*

Fig 3: *Example Training*

Fig 4: *Example Training Session*

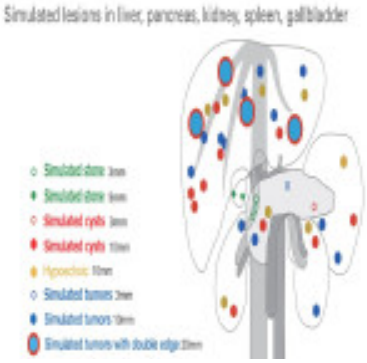

Fig 5: *Simulated Images*

Anatomical Structures	On Phantom (n=80) %	On Student (n=40) %	Pearson*	P
Liver	100	100	0.98	0.01
Liver segmental anatomy,	87	75	0.88	0.48
Liver portal and hepatic venous systems,	88	83	0.80	0.45
Liver ligamentum teres and ligamentum venosum	89	78	0.79	0.42
Biliary tract (gallbladder)	100	100	0.99	0.01
Biliary cystic duct,	93	88	0.89	0.48
Biliary tract (intrahepatic and extrahepatic bile ducts)	92	78	0.81	0.48

*sig <0.05

Table 1: *Anatomical Structures on both phantom and on students.*

Pathologies:	On Phantom (n=80) %
Hepatic Lesions (cystic and solid),	89
Gallbladder and bile duct stones,	85
Pancreatic tumors (one invading the portal vein),	75
Splenic lesions,	79
Both kidney lesions, and left adrenal tumor.	79

Table 2: *Pathologies detected on Phantom*

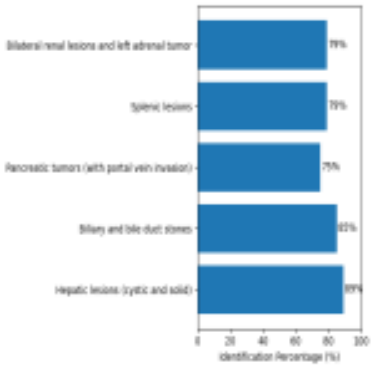

Fig 6: *Identification of Pathologies on Phantom*