

Replacing contrast CT with CEUS in follow-up of renal tumors

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Common themes identified were that students:

- Appreciated their encounter with ultrasound since they knew they would need it in their future careers.
- Students lamented the infrequency of ultrasound sessions and requested more.
- Enjoyed the clinical contextualization which ultrasound added to anatomy teaching.
- Reported that ultrasound highlighted the anatomical relationships between structures, enabled anatomical differences between individuals and/or pathologies to be seen, reinforced knowledge of cross-sectional anatomy and demonstrated the dynamic nature of living anatomy.
- Found ultrasound conceptually difficult, although students who scanned each other found image orientation easier with practice and requested more scanning opportunities.
- Often struggled with image and probe orientation. Simplified instruction from experienced tutors assisted students with these challenging concepts.
- Suggested that an extended introductory teaching session on knobology and ultrasound physics would have aided their conceptual understanding.
- Reported that, depending on the body region, they were reasonably comfortable being scanned in front of their peers during teaching sessions.
- Consistently preferred small group teaching for ultrasound activities. There was mixed feedback from students regarding the suitability of the learning environment.

Overall, students valued their undergraduate ultrasound encounter highly and they support the introduction of ultrasound into the undergraduate medical curriculum.

References:

Glaser, B.G. and Strauss, A.L. (2007) *The Discovery of Grounded Theory*. Piscataway, NJ: Aldine Transaction.

Renal ultrasound

Ultrasound imaging of renal transplants, C Harvey, Hammersmith Hospital, London

Ultrasound is the initial imaging modality employed in the evaluation of renal transplants. However, ultrasound faces limitations in the assessment of the renal microcirculation, cortical perfusion and focal complex cysts and masses. Microbubbles can be used to overcome these problems. Microbubbles are extremely safe/well tolerated pure intravascular agents and can be used in renal failure and obstruction where CT and MR contrast agents may have deleterious effects. Real-time prolonged imaging can be performed without exposure to ionising radiation and at a lower cost than CT or MR imaging. This presentation covers the EFSUMB guidelines and describes how microbubbles can be used to extend conventional ultrasound and help in everyday problem solving. Ultrasound contrast agents can be used to characterise indeterminate renal lesions, complex cysts and focal inflammatory lesions. Contrast enhanced ultrasound is excellent for assessing the renal vasculature and can be used in the diagnosis of renal artery stenosis, renal infarction, renal arterial/venous thrombosis, trauma, as well as the quantification of cortical perfusion. Future applications of microbubbles include the delivery of therapeutic agents and genes.

Replacing contrast CT with CEUS in follow-up of renal tumours, H Wijkstra, AMC University Hospital, Amsterdam

Stringent imaging follow-up is essential after renal tumor ablation. Drawbacks of post-ablation follow-up (FU) by the normally used contrast-enhanced CT (CECT) are the associated ionizing radiation and nephrotoxic contrast-agent.

Especially in the USA, there is a concern because the annual per-capita effective radiation dose doubled between 1960 and 2006 mainly due to medical imaging. Contrast-enhanced ultrasound (CEUS) has shown potential in imaging the perfusion of the microvasculature without using ionizing radiation or toxic contrast-agents. We used CEUS and CECT in patients undergoing cryo-ablation of renal tumors, before and after the treatment.

Methods:

From 01/2006-01/2009 a CEUS was performed before and after cryo-ablation (up to 12 months) in addition to regular CECT/MRI. Using an enhancement-score the cryo-lesion was assessed by both modalities and concordance of enhancement-score was determined.

Results:

3 months after cryo-ablation: Both modalities were available in 32 cases. Enhancement-score corresponded in 23/32 cases (72%). 7 cases showed enhancement on CECT/MRI with no enhancement on CEUS. 2 cases showed enhancement on CEUS without enhancement on CECT/MRI. 12 months: Both modalities were available in 21 tumors. Enhancement-score corresponded in 19/21 cases (91%). 2 cases showed enhancement on CEUS without enhancement on CECT/MRI.

Conclusions:

This study shows that CEUS is an imaging technique with high concordance of enhancement-score between CEUS and CECT/MRI. CEUS therefore might be used to diminish the radiation burden and use of nephrotoxic contrast-enhanced cross-sectional imaging in the long-term follow-up.

CASE: Paediatric renal vascular injury, GT Yusuf, M Sellars, DY Huang, PS Sidhu, King's College Hospital, London

A 3 year old boy had a weight dropped on his abdomen, while playing in his father's gym. He remained haemodynamically stable and was taken for computerised tomography (CT). The CT showed left renal artery avulsion with complete devascularisation of the left kidney. An ultrasound scan was subsequently performed. Greyscale images revealed irregularity in keeping with traumatic injury. Contrast enhanced ultrasound (CEUS) revealed a completely avascular renal cortex, however the medulla showed preserved vascularity via collateral blood supply. The patient had subsequently been followed up in clinic. This case demonstrates the usefulness of CEUS for dynamic assessment of vascularity, particularly in single organ trauma follow up. In comparison, CT imaging represents an image at a single moment in time and provides a radiation risk while MRI can be prolonged and intimidating for children and may require sedation.

Can a contrast enhanced ultrasound nephrostogram be used instead of a fluoroscopic nephrostogram?: preliminary findings, M Daneshi, K Patel, ME Sellars, PS Sidhu, DY Huang, King's College Hospital, London

The use of contrast-enhanced ultrasound (CEUS) has extended beyond traditional uses, and the possibility to delineate percutaneous tubes and drains is achievable. Percutaneous fluoroscopic nephrostomy (PCN) insertion is the standard of management for an obstructed kidney. We have compared the traditional fluoroscopic nephrostogram using iodinated contrast agents with CEUS nephrostogram to ascertain the accuracy, utility and convenience of the CEUS nephrostogram.