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Remote Proctorship: Bringing World Class Expertise to Every Operating Table

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To the Editor,

We present our experience of remote proctorship in the expansion of our oncology services, offering our patients advanced minimally invasive therapeutic options and live guidance from international experts.

Tumour ablation is a growing field within Interventional Radiology, expanding treatment options in renal, hepatic, lung and bone lesions [1]. Whilst the procedure is gaining acceptance, the expertise is still largely concentrated within specialist centres. Until recently, the few experienced practitioners could travel to support other clinicians but the recent pandemic led us to explore remote proctorship.

Many teleconferencing programmes are available and were widely utilised by our institution to carry out secure, socially distanced meetings; however, the set up was inadequate for theatre. The novel digital platform, Proximie® (Proximie Limited, London, UK), has previously been used as a teaching tool for surgical trainees [2]. Its use has also been reported in surgical cases [3]. Proximie® is a secure, cloud-based augmented reality platform that allows real time collaboration between onsite operators and remotely located supervisors. A total of 7 cases were performed enabling a specialist in mainland Europe to remotely oversee the procedures. One lung, 1 musculoskeletal and 5 renal cases were performed including 1 paediatric patient (Fig. 1). All cases were treated with cryoablation except the lung lesion which was treated with radiofrequency ablation. The paediatric patient underwent cryoablation for a benign vascular malformation.

Our theatre setup is demonstrated in Fig. 2. Two cameras were used to relay the live operating field and the cryoablation device to the specialist. The intra-procedural CT images displayed in theatre were directly linked. Figure 3 demonstrates intra-procedural theatre setup. The specialist utilised the integrated augmented reality tools to point, annotate and demonstrate on the screen in theatre.

A post-procedural questionnaire was completed by the operators and the proctor. Overall, the operators felt comfortable when using Proximie® and, importantly, felt that patient safety was enhanced by the use of the technology. Patients did not object to the use of teleproctorship. During consent, they were made aware that the purpose of the technology was to provide live expert guidance to increase the likelihood of a successful procedure. The reliance on the local network for bandwidth was the only concern reported. The ability to use augmented reality tools such as live image annotation was deemed very useful. The operators unanimously agreed that it would be useful as a teaching tool.

It has been reported in the literature that teleproctorship results in learning at a similar rate as to direct mentorship. There were some safety concerns specifically with regards to the management of intra-operative complications [4]. If teleproctorship is being considered for the teaching of an entirely new procedure or technique, we suggest using the

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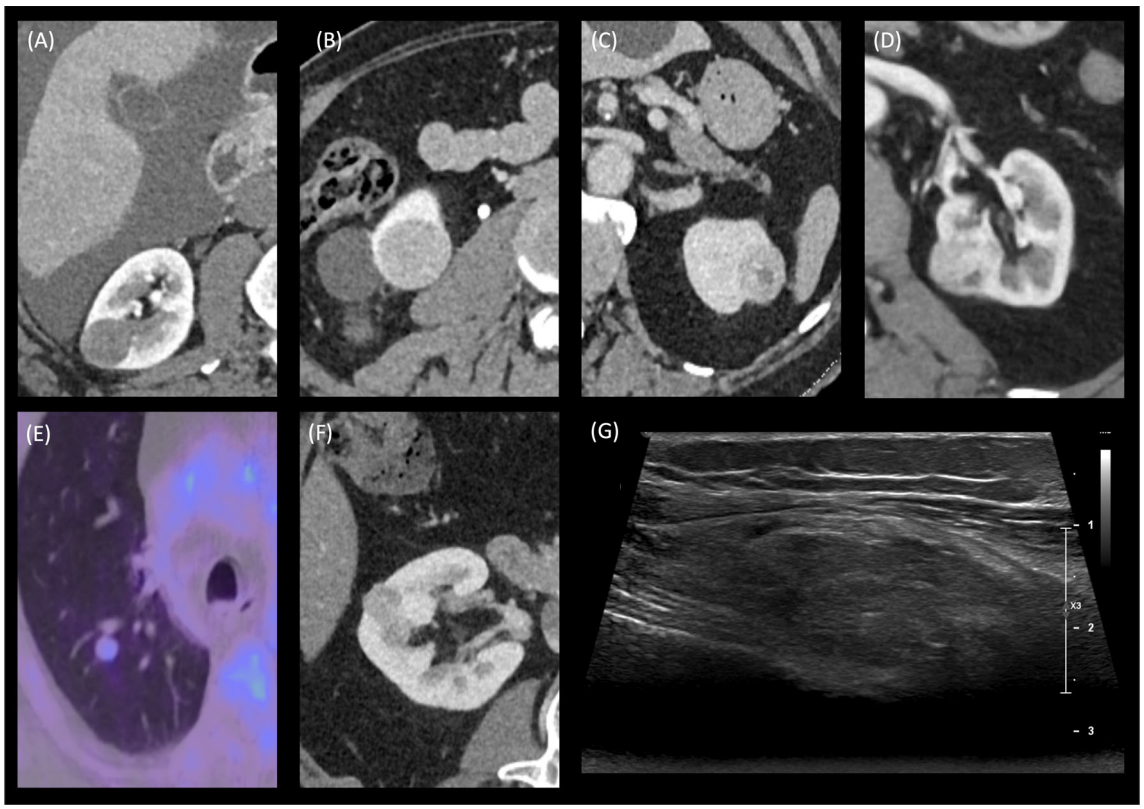

Fig. 1 Ablation targets, **A** Right upper pole RCC; **B** Right lower pole RCC; **C** Left lower pole RCC; **D** Left interpolar RCC; **E** Right upper lobe pulmonary nodule; **F** Right interpolar RCC and **G** Paediatric left lower lateral thigh intramuscular fibroadipose vascular anomaly

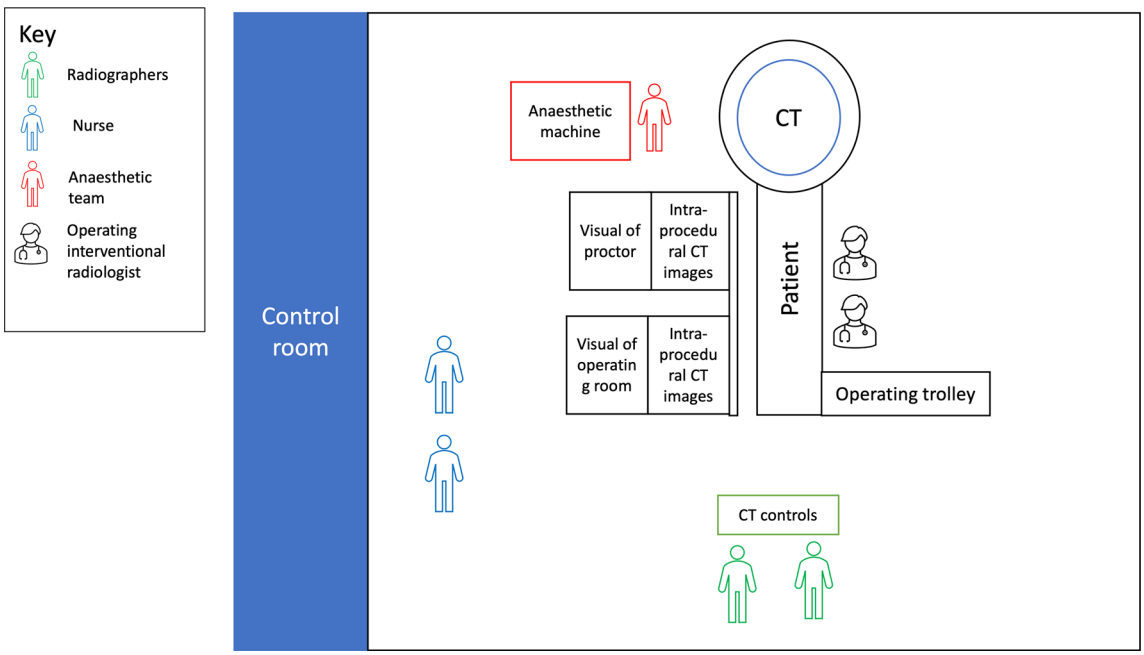

Fig. 2 Schematic diagram of the theatre floor plan

Fig. 3 Intra-procedural theatre set up during CT guided lung lesion ablation

technology in a simulation setting first to ensure adequate familiarity with the procedure and the technology. It is equally important to put in place a clear escalation plan in the event of a complication to ensure there is appropriate support available.

During the pandemic, travel was not an option but even with no travel restrictions, the use of teleproctorship reduces the time and money spent on travel between centres and allows for greater flexibility in patient scheduling. Proximie® has also enabled complex surgical procedures to be performed in war torn countries where the expertise was otherwise unavailable [5].

Our experience with the Proximie® platform, whilst limited, was generally positive. Using this system, the proctor was able to remotely supervise the operating clinicians, increasing their operative experience safely and enabling them to move towards independent practice ultimately resulting in service expansion. The IT capabilities of the hospital and the escalation plans in the event of unexpected complications need to be considered prior to commencing a case. We believe that remote proctorship could have a big impact in the training of Interventional Radiologists around the world.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Consent for Publication Consent for publication was obtained for every individual person's data included in the study.

Informed Consent Consent is filed within patient notes.

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