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'Rolling out radioguided occult lesion localisation for breast tumours': moving from ROLL to ROLLIS

Re: Chung, DKV. Rolling out radioguided occult lesion localisation for breast tumours. *J Med Radiat Sci* 2015; **62**(1): 1–2.

We read with interest the editorial by Chung[1] discussing advantages of radio-guided occult lesion localisation (ROLL) over other commonly used pre-operative localisation techniques for breast tumours. While the results from our audited introduction of ROLL[2] support the conclusion that ROLL is "a simple and effective solution for guiding the excision of impalpable breast lesions", two important drawbacks were noted:

(1) The ROLL radiopharmaceutical is not radiopaque. Confirmation of correct lesion localisation prior to surgery is important to avoid a failed operation. While precise needle placement can be confirmed in real time with ultrasound guidance, this is difficult to do when using mammographic guidance unless a marker clip or radiopaque contrast is employed.
(2) Because of the short half-life of technetium-99m (Tc-99m), the ROLL injection must be performed on the day of surgery or the preceding afternoon. This co-dependence between the injection and operation time can cause scheduling conflicts and reduce activity.

Following our experience with ROLL, we performed a pilot study where a low activity iodine-125 seed and a back-up hookwire were inserted into impalpable breast lesions using ultrasound or stereotactic guidance (Radioguided Occult Lesion Localisation using Iodine 125 Seeds, "ROLLIS").[3] The seeds are 0.8 × 4.5 mm radiopaque titanium cylinders containing ~ 2 MBq of I-125 adsorbed onto a silver wire. The energy emitted by I-125 (27 keV) differs significantly from that emitted by the Tc-99m used for sentinel node mapping (140 keV). As most intraoperative gamma probes used for sentinel node localisation can distinguish between them, the same probe can be used to guide excision of both node and breast lesion.

Several studies have reported improved margin status and re-excision rates for ROLL and ROLLIS compared with hookwire localisation[4] however ROLLIS has advantages over ROLL:

(1) I-125 seeds are radiopaque, allowing easy confirmation of placement accuracy on pre-operative mammography.
(2) Unlike hookwires and the liquid form of tracer used in ROLL, I-125 seeds rarely migrate after insertion, providing a stable point source of radioactivity for precise lesion localisation.[5]
(3) The long half-life of I-125 (~59 days) means seeds can be inserted several days before surgery, improving scheduling, efficiency and patient convenience.
(4) After adjusting for tumour size on mammography, specimen weight for DCIS lesions was significantly lower with ROLLIS compared with ROLL.[6]

As noted for ROLL, the learning curve for ROLLIS is short. Radiologists and surgeons found it easier to use than hookwire and were able to depend entirely or to a high degree on the seed to guide surgery in over 80% of our cases. Having now tried hookwire, ROLL and ROLLIS, our radiologists and surgeons prefer ROLLIS.

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