

‘BREAST SURGERY GOES WIRELESS’: Evaluation of RFID Tags for Localisation of Non-palpable Breast Lesions at Medway Maritime Hospital

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Background

- As early breast cancer detection rates have increased, many lesions are small and non-palpable at the time of diagnosis and treatment.
- For this reason, many patients qualify for breast conservative surgery
- Localisation of tumour at the time of surgery then becomes important
- There are many ways to localize a lesion for the surgical team
- Wire localization was predominantly used in the BCU
- Which requires wire placement on the morning of the operation



- RFID TAG is smaller than a coffee bean

- It has a polypropylene cap designed to prevent migration in the breast tissue
- Each TAG has a unique identification number which is displayed on the reader and can be confirmed at the time of surgery
- The TAG can be placed up to 7 days prior to the operation date, allowing it to embed within the tissue, thereby reducing migration.

Methodology

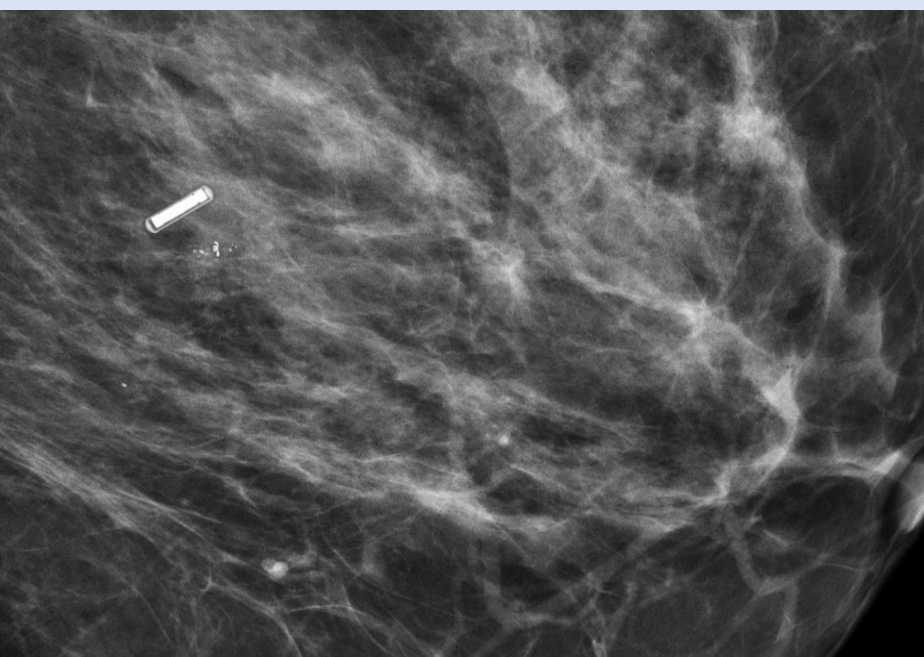
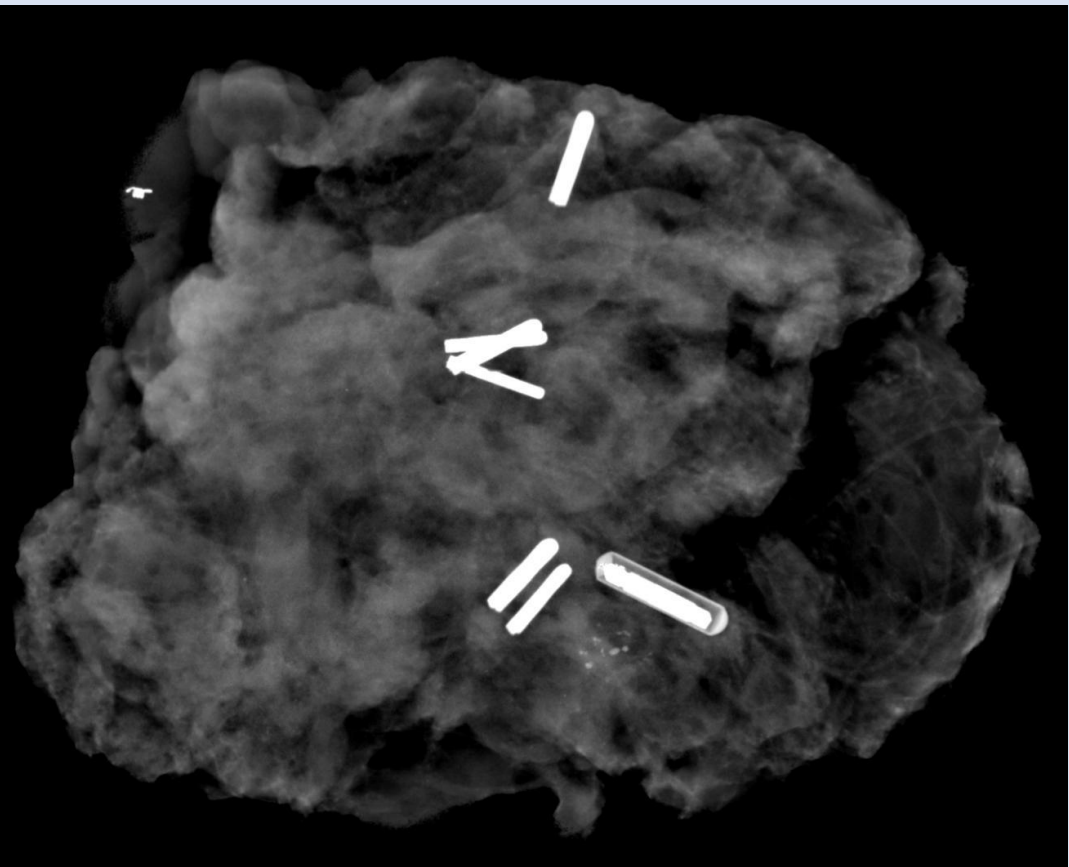
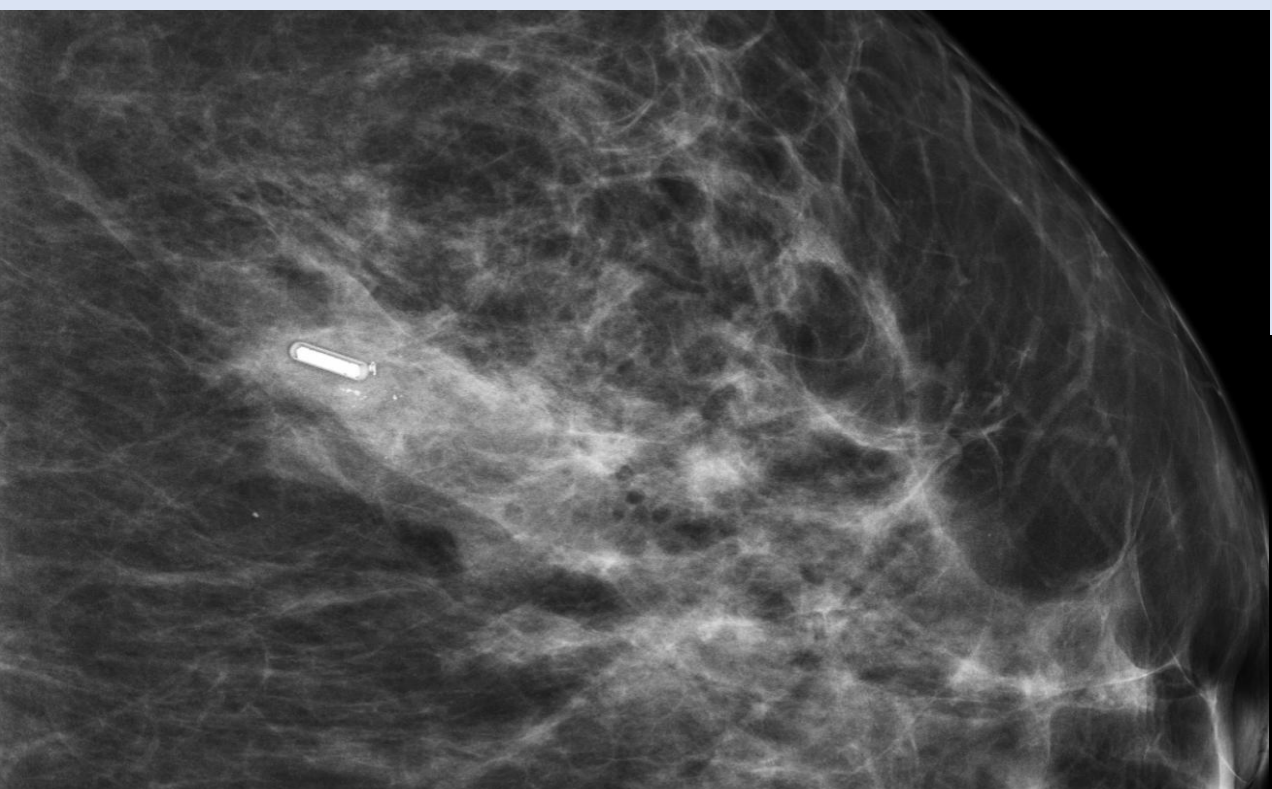
Data was collected in a prospective cohort of the first 100 RFID TAGs that were inserted.

INCLUSION:

- All non-palpable malignant lesions at least 7 days prior to surgery

EXCLUSION:

- Palpable lesions
- Large breasted women– DD cup and up
- Patients' mental health status – i.e. Dementia/mental health issues/medical anxiety



Surgical Specimen

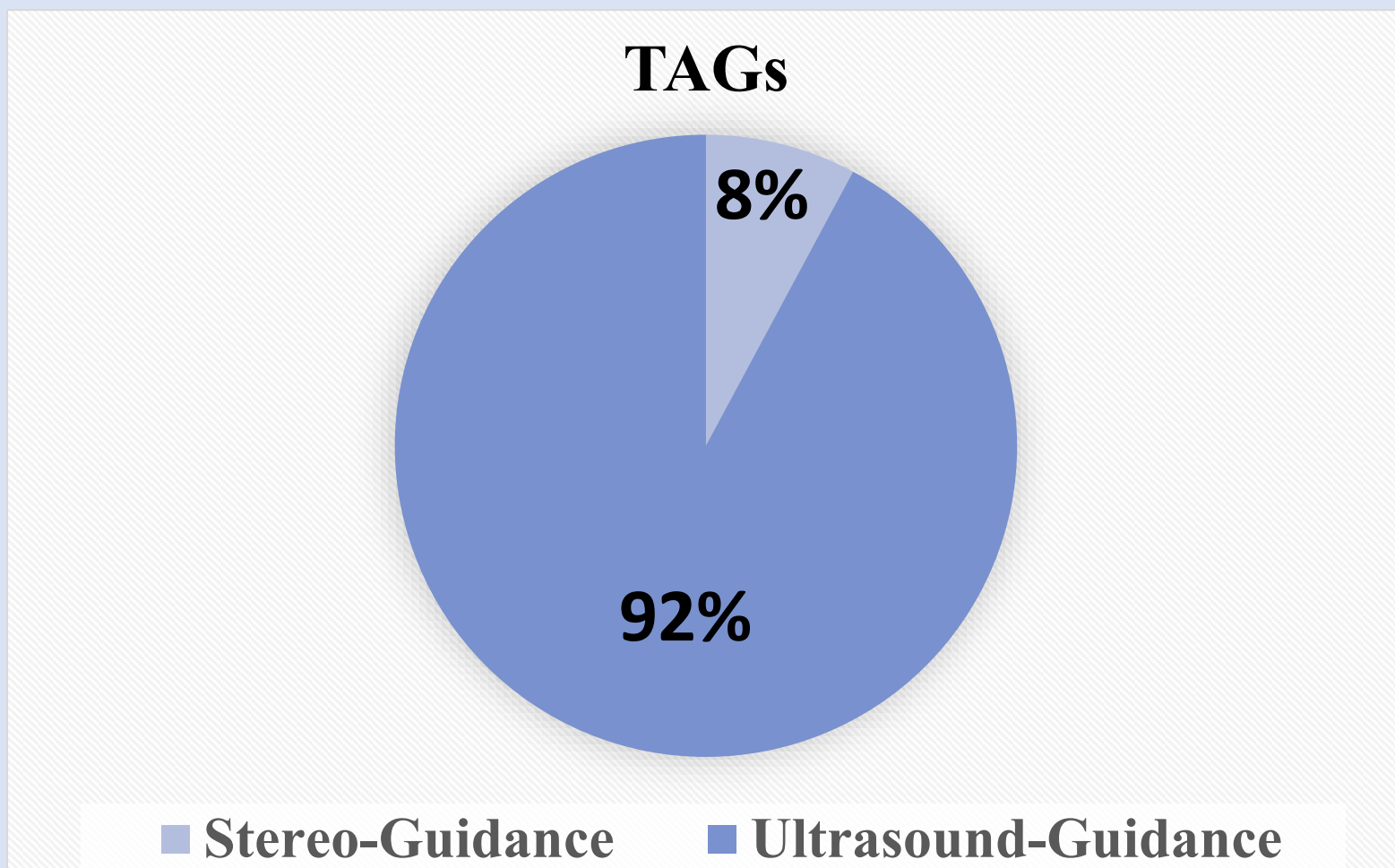
4mm Calcification

Procedure	Activity	Cost Per Procedure (£)	Total Cost (£)
Wires	248	£80	£19,840
Tags	248	£270	£66,960
		Variance	£47,120

Efficiency	Activity	Cost Per Additional Session (£)	Total Cost (£)
One Stop Reduction	21	£3000	£63,000
Theatre List Reduction	20	£1,150	£23,000
rexcision of margin	10	£1,150	£11,500
Total	41		£97,500

Results

All 100 Tags were successfully deployed
7 were placed under stereo-guidance
1 had migrated, which was placed under stereo-guidance
10 of which needed re-excision of margins
All were successfully retrieved at the time of surgery



Actions

Increased theatre utilisation through improved scheduling with no need to allow for wire insertion before the lists start.

Savings

One extra case per list

62 lists instead of 82 (saving 20 extra lists)

Reduced requirement for additional One-Stop clinics as slots not being blocked for wire insertion

2 clinic slots per clinic

Releasing 496 slots

Increased precision and perception of the lesion has the potential to reduce the number of patients requiring further surgery (reduced by up to 10%) to excise positive margins, reducing demand for theatre capacity.

Possible reduction in demand of 0.5 cases per week

Saving 10 extra lists

💰 **Switching to RFID TAG localization reduces operating costs by £50,380 annually for the NHS, even though TAGs cost more per unit, they save resources through better scheduling and efficiency.** 💰

Overall Experience

Patients:

- Reduced anxiety on the day of the operation resulting in positive patient experience
- Improved patient flow on the day of the operation
- No additional procedural risk to the patient compared to wire insertion
- Improved patient outcome – with reduced re-excision rate.

Thereby optimising theatre capacity

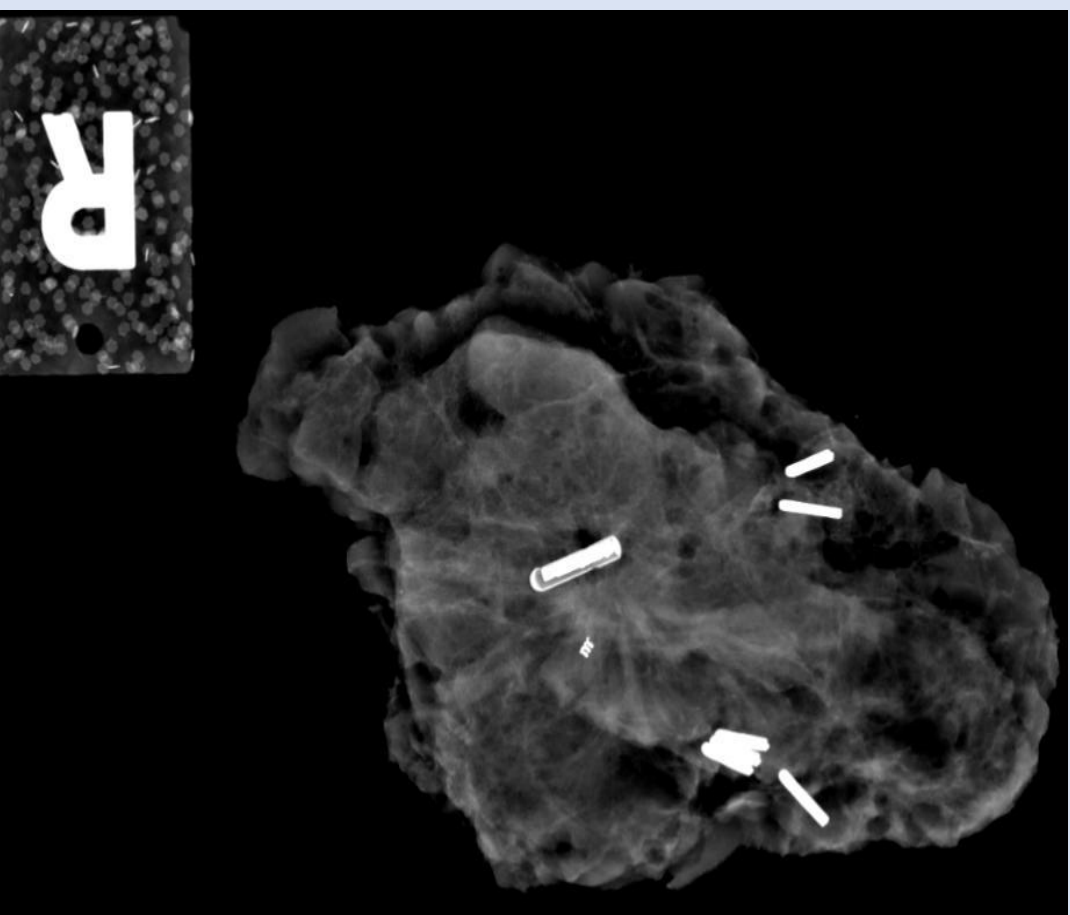
Clinical side:

- Surgeons have reported excellent intra-operative detection rate and retrieval
- Better cosmetic outcome
- Reduced administration and less time constraint on the day of the operation
- Effective and time efficient practice benefitting both the radiology and surgical team
- Gain in both One-Stop slots and surgical slots
- Optimising theatre capacity
- Improving breast cancer standards as a whole.

References:

- Use of Hologic LOCALizer radiofrequency identification (RFID) tags to localise impalpable breast lesions and axillary nodes: experience of the first 150 cases in a UK breast unit. Lowes, S. et al. Clinical Radiology, Volume 75, Issue 12, 942 – 949.
- Heywang-Koebrunner, S. H., Schreer, I. and Barter, S. (2014) Diagnostic Breast Imaging: Mammography, Sonography, Magnetic Resonance Imaging, and Interventional Procedures.
- Lowes, S., Bell, A., Milligan, R., Amonkar, S. and Leaver, A., 2020. Use of Hologic LOCALizer radiofrequency identification (RFID) tags to localise impalpable breast lesions and axillary nodes: experience of the first 150 cases in a UK breast unit. Clinical Radiology, 75(12), pp.942-949.
- Hologic.com. 2021. LOCALizer™ Wire-free Guidance System. [online] Available at: <https://www.hologic.com/hologic-products/breast-health-solutions/localizer-wire-free-guidance-system> [Accessed 2 May 2021].

ACCEPTABLE PLACEMENT



TAG lies just outside the lesion but is still acceptable, as it is less than 5mm away from lesion. Completely removed with no involved margins.