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The novel use of Sentimag to localise metallic foreign bodies in soft tissue

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Background

Foreign body impaction in soft tissues may occur after trauma or self-embedding. Surgical retrieval of these bodies can be technically challenging and requires detailed planning and multiple localisation modalities peri-operatively (1).

Technique

The Sentimag platform (Endomagnetics Ltd., Cambridge Business Park, Cambridge, UK), increasingly used in breast surgery, allows localisation of magnetically susceptible materials by exerting an alternating magnetic field and detecting their induced magnetic field (2-3).

This allows localisation of most metallic/metal-containing objects. The probe device uses a paired sound and numerical signal which changes when the magnetically susceptible material is approximated (3).

Non-metallic reusable surgical instruments are routinely used/available to avoid signal interference.

Discussion

Currently reported intraoperative localisation techniques include fluoroscopy and intraoperative ultrasound, with associated problems being irradiation and inexact localisation, and operator expertise, respectively (1, 4).

Sentimag was developed to localise pre-operatively inserted magnetically susceptible markers, which in turn, is preoperatively used to localise impalpable breast tumours and sentinel lymph nodes (2-3, 5).

In the context of foreign body retrieval, *real-time* feedback and the ability to alter the probe angle and distance within the wound allows for precise siting of skin incision (if required) and foreign objects localisation during dissection. Its use potentially reduces the risk of surgeon injury from blind palpation or inadvertent foreign object migration and consequent iatrogenic injury of adjacent structures.

Many surgical breast units will already have Sentimag readily available for co-use. Its paired audio and numerical feedback signals makes its use intuitive and associated with a short learning curve (5).

Video

Video 1: Using the Sentimag platform to localise foreign bodies (Link:

<https://www.dropbox.com/s/joqu3tczrubh195/Sentimag%20Technical%20Note%20video.mp4?dl=0>)

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