Simple hand-held metal detectors are an effective means of detecting cardiac pacemakers in the deceased prior to cremation

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ABSTRACT

The hazard of undetected cardiac pacemakers exploding in crematoria is well described. This short report describes the use of an affordable hand-held metal detector to detect cardiac pacemakers. Over the course of a year, the metal detector located 100% of cardiac pacemakers in a district general hospital mortuary. A simple model using pigskin and fat is also used to demonstrate the effectiveness in vitro. Commercially purchased hand-held metal detectors should be used in all mortuaries responsible for detection and removal of cardiac pacemakers prior to cremation.

Cardiac pacemakers and implantable cardiac defibrillators are well-known explosion hazards during cremation. The first published account of such an explosion occurred in September 1976 in Solihull, UK.1

News of the incident was reported in medical journals around the world.2–4 Within a month of the explosion, cremation forms were modified such that doctors completing the form had to declare whether a patient has an indwelling cardiac pacemaker and whether it has been removed prior to cremation. Initially described as ‘an interim measure’,2 these statements still exist on current cremation forms in 2010.5

Our mortuary services a busy district general hospital handling close to 3500 bodies per year. All bodies scheduled for cremation are manually palpated to ensure that there is no previously undetected pacemaker present.

Throughout 2009 and the latter half of 2008, the authors have trialled the use of a small hand-held metal detector in conjunction with routine manual palpation. This metal detector has shown excellent sensitivity and has detected 100% of the pacemakers and implantable cardiac defibrillators present.

The device is easy to use, portable, and very affordable. Such devices cost less than £20 at most hardware stores and home DIY stores.

Most have two settings: one to detect metal and the other to detect electrical current. The metal detection setting is sufficient for detecting pacemakers.

In addition to auditing the use of the metal detector over a whole year, we created an in vitro model to further test the efficacy.

Layers of fresh pig skin and fat, supplied by a local butchery, were used to simulate a chest wall.

A wide range of cardiac devices were then placed under the ‘chest wall’ and the metal detector was tested. All were easily detected through both the very thick pig skin and 20 mm of fat, regardless of manufacturer or model (see figure 1).

The use of a hand-held metal detector to locate an impalpable cardiac pacemaker has been previously described in a case report.6

A survey of crematoria in 20027 indicated that many respondents believed that such a device could be useful and that further study was warranted.

We acknowledge that we are not the first to use such a device for this purpose, nor the first to suggest its use for this purpose.6

Its use, however, is not widespread and there do not appear to be any published reports in English medical literature describing their routine use in the mortuary.

With obesity on the increase and technological advances resulting in the decreasing size of the cardiac devices themselves, manual palpation of cardiac pacemakers will become increasingly unreliable. We therefore wish to publicise this simple, yet effective, technique and propose that hand-held metal detectors are used as an adjunct to manual palpation in all mortuaries.

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Figure 1  Testing the detection of numerous models and manufacturers of cardiac pacemaker through pig skin and fat.
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REFERENCES


Take-home messages

- Pacemakers are an explosion hazard if not removed prior to cremation.
- Pacemakers of many manufacturers and models are easily detected by simple hand-held metal detectors.
- Such metal detectors should be used routinely in all mortuaries, especially with increasing obesity in the future and increasingly smaller sized pacemakers.
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