Radiographer Abnormality Detection Systems: How accurate are we?

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INTRODUCTION

Radiographers' contribution to image interpretation should not be underestimated and work by Berman *et al.* 1985 was some of the first to recognise preliminary image interpretation by radiographers (1). In a study that assessed how accurately staff can recognise and describe trauma, radiographers' scores were statistically higher than Emergency Nurse Practitioners (ENPs). By providing a written comment, radiographers are replacing the ambiguous 'red dot' previously used to highlight abnormal radiographs (2). The aim of this audit was to establish how accurate radiographers are at using a 'red dot' abnormality detection system, with a view to implementing written preliminary clinical evaluation (PCE). This audit was confined to an urgent care centre where it is felt that radiographers are most frequently relied upon for their interpretive opinion (1).
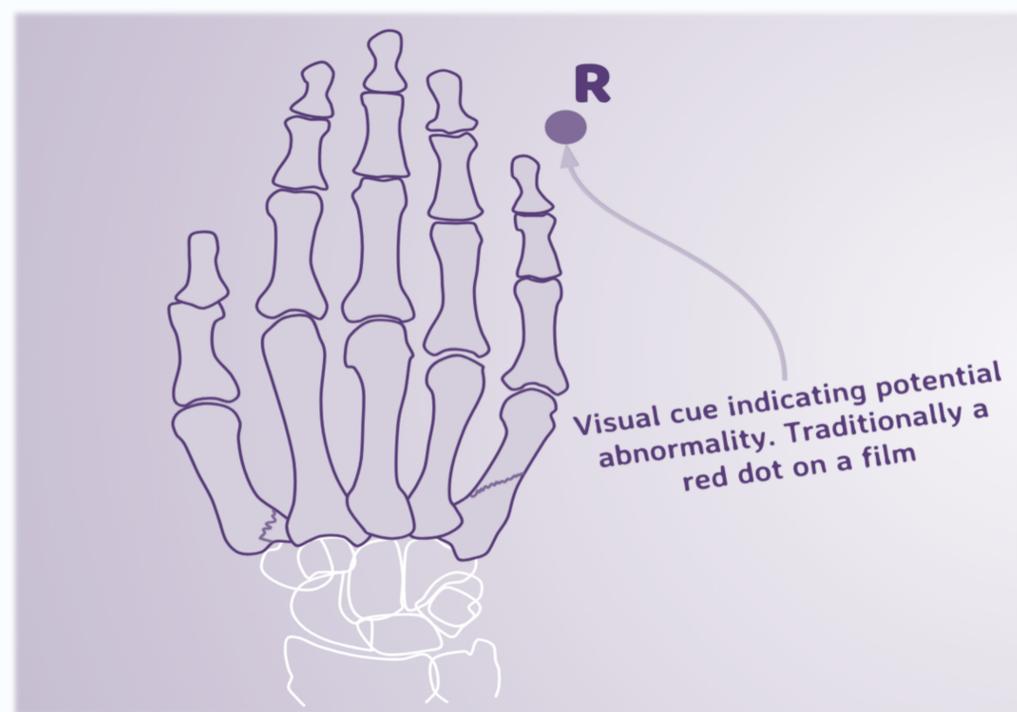
METHOD

The data was taken over a 6 month period from November 2018 to April 2019. The audit included all referrals for either: ?#, ?dislocation or ?FB. All appendicular and axial examinations were incorporated (excluding chest and abdomen).

FINDINGS

- Across the 6 month period, 618 (32%) false negatives (FNs) were identified.
- The majority of the FNs identified were paediatrics. In the immature skeleton, fractures of the metacarpals, phalanges and ankle joint were most commonly missed. Abnormalities of the wrist, elbow and clavicle were most frequently picked up (true positives). In paediatrics, examinations of the ankle were most commonly overcalled as abnormal by radiographers (false positives).
- In the adult skeleton, metatarsal fractures were most frequently missed (FNs), whereas fractures of the wrist, metacarpals and ankle were most commonly identified (TPs). Wrists were also most commonly overcalled as abnormal (FPs).
- For those that successfully identified abnormalities, less than 10% used PACS or a radiology information system to write supporting preliminary comments.

FIGURE 1. RED DOT ABNORMALITY DETECTION SCHEME (3)

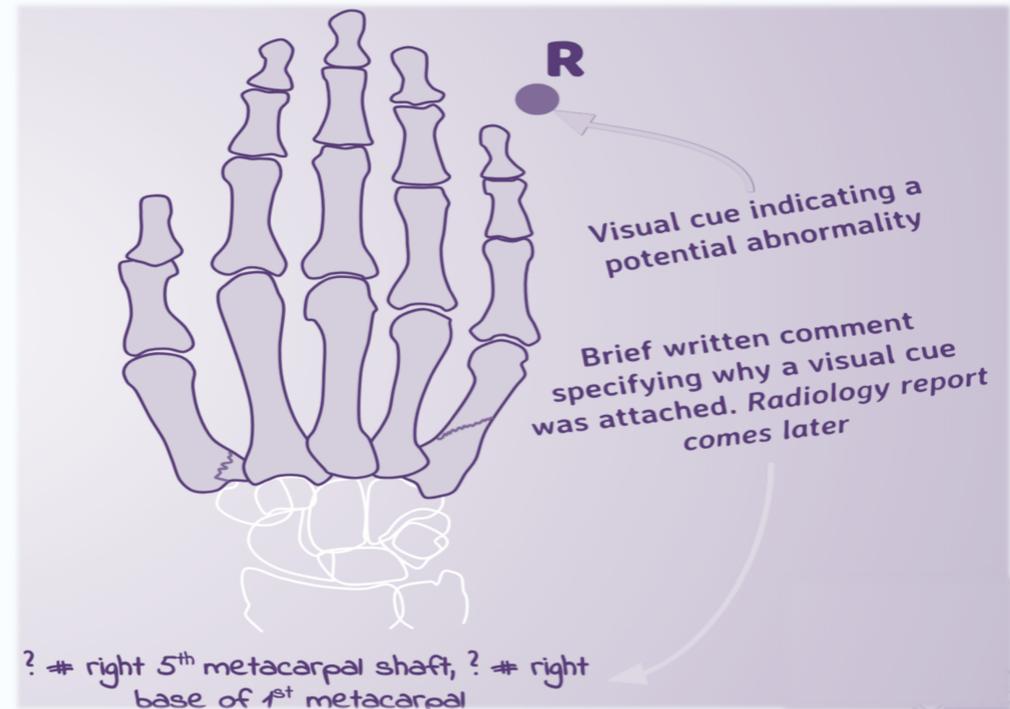Visual cue indicating potential abnormality. Traditionally a red dot on a film

DISCUSSION

One of the key benefits of the red dot system is the increased level of communication between the radiographer and the referring clinician. Images with a red dot seek greater scrutiny by the referrer which has found to reduce the overall number of errors in the emergency department (4). Nevertheless, red dot systems do not specify what potential abnormality the radiographer is flagging, which poses a considerable degree of ambiguity. Furthermore, the relatively informal nature of the red dot system, and its often optional approach, are inconsistent with delivering reliable outcomes for patients and referrers (5).

PRELIMINARY CLINICAL EVALUATION (PCE)

The College of Radiographers (CoR) expects those services operating 'red dot' systems to phase them out in favour of writing informed, clinical comments, also known as preliminary clinical evaluation (PCE) (6). Since 2006, universities have included the principles of image assessment and reporting in pre-qualifying education programmes to ensure that at qualification, radiographers are competent to provide written preliminary comments. It is important to remember therefore, that the CoR considers PCE as a core competency of the profession. Furthermore, section 13.21 of the Standards of Proficiency states that radiographers must recognise common pathology (7). It is fundamental therefore that these skills are continually developed and assessed and act as a major focus of a radiographer's continuing professional development (CPD) (8).

FIGURE 2. PRELIMINARY CLINICAL EVALUATION (3)

Visual cue indicating a potential abnormality

Brief written comment specifying why a visual cue was attached. *Radiology report comes later*

? # right 5th metacarpal shaft, ? # right base of 1st metacarpal

Results of this audit provide strong evidence to suggest that radiographers can successfully recognise abnormal radiographs in the trauma setting. Since hot reporting services are not always guaranteed, implementing PCE would be of significant benefit in the primary care setting, helping to reduce the number of patients discharged without appropriate management (9). Ongoing in-house training and education lead by reporting radiographers would help to maintain and improve radiographers' skills in this area.

RECOMMENDATIONS FOR FUTURE PRACTICE

Continuous individual and group based audit to identify areas for development

Scheduled sessions with reporting radiographers
- Increase understanding of radiographic pathology and disease
- Appreciate the importance of good radiographic technique

Electronic communication system to discuss PCE
- Many departments attach a 'sticky note' on a PACS system to inform referrers of any suspicious findings. Many clinicians however do not view images on PACS. Instead, images are viewed on a central patient administrative system. Subsequently, it would be beneficial to develop software which allows comments to feed from the radiology information system to the central program used by the majority of referrers. Ideally, referrers would be able to acknowledge any PCE made by the radiographer. Preferably, the radiographer would then receive a notification to say the clinician had acknowledged their comments.

Scheduled teaching sessions with other multidisciplinary professionals
- Increase understanding of radiographic pathology and disease
- Importance of providing a good clinical history for the reporting clinician

Monthly CPD lectures (topic dependent on areas identified for improvement)
- E.G. In March, a lecture on hand trauma due to high number of FNs that month

Study events
- Red dot/PCE study events regularly advertised through the SCoR

Access to E-Learning for Health modules

Descriptive posters behind control panel with terminology that can aid in PCE
- E.G. transverse, oblique, spiral fracture

CONCLUSION

Maximising the contribution of all members of the diagnostic team is central to improving capacity, efficiency and patient experience. It also supports the national values outlined by Health Education England in supporting the development of Advanced Clinical Practice (10)(11). It is hoped that through implementing these recommendations, staff feel engaged and begin to take ownership in some of their everyday practice. This will ensure high standards are maintained. Furthermore, with cancer workforce plans set to include the appointment of 300 reporting radiographers by 2021, this is an exciting time for staff to develop and extend their role (11).

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