

## Selective radiographic assessment of acute ankle injuries in the emergency department: barriers to implementation

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**D**espite numerous articles in the medical literature focusing on the overuse of radiography in the assessment of acute ankle injuries, the practice continues. The failure of these studies to significantly alter the practice behaviour of the physicians concerned suggests that they were inconclusive or failed to address other relevant issues. Practice design and patients' expectations appear to act as barriers to physician motivation and to the implementation of any conclusive study results.<sup>1</sup>

The clinical literature does not consistently identify specific signs and symptoms, or combinations of signs and symptoms, as valid discriminators between bony and soft-tissue injury in the ankle. Brand and colleagues<sup>2</sup> concluded that point tenderness was the only valuable discriminator between bony and soft-tissue injuries distal to the knee. Vargish and associates<sup>3</sup> looked at 24 separate signs and symptoms and concluded that tenderness over the lateral aspect of the ankle below the malleolus, with some ability to bear weight at the time of examination, was consistent with a 97.5% probability of isolated soft-tissue injury. The latter investigators disagreed with the former about the value of point tenderness as an indicator of bony injury. However, they agreed with Brooks and coworkers,<sup>4</sup> who concluded from a prospective study that localized tenderness over the anterior fibres of the talofibular ligament is consistent with soft-tissue injury and does not warrant radiographic assessment. In a retrospective study of 100 acute

ankle injuries and 93 cases of ankle fracture, de Lacey and Bradbrooke<sup>5</sup> developed the maxim "no swelling adjacent to a malleolus, no radiograph". Cockshott and collaborators,<sup>6</sup> in a study of 242 consecutive ankle radiographs of patients with acute ankle injuries, agreed with de Lacey and Bradbrooke that soft-tissue swelling was the most valuable indicator of bony injury. The observations of Vargish and associates<sup>3</sup> and Brand and colleagues<sup>2</sup> were not in agreement with this finding.

The character and design of emergency medical practice are unique. The transient nature and high patient volume fragment the relationship between the patient and physician, and this creates problems. The fragmented, transient doctor-patient relationship is an important factor in the defensive nature of emergency medical practice.

The design of emergency practice does not encourage patients to return for reassessment. The physician tends to perform a more aggressive investigation to arrive at a definitive diagnosis before the patient leaves the department. When a patient is sent home, it is important (if not essential) to have ruled out life-threatening problems and to have labelled any untoward sequela or expected debility, because the physician's direct involvement in care of the patient is finished.

Transient doctor-patient relationships and the lack of follow-up by the emergency physician are major factors in the high use of radiographic assessment in the emergency department. Patients appear far more willing to accept a negative radiographic report than the clinical assessment of a physician they do not know; they rarely argue with a negative report but frequently challenge the emergency physician who suggests they do not need radiographic assessment. Patients are also more likely to bring a complaint or malpractice suit against a physician they do not know than one

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they do know. Although Brand and colleagues<sup>2</sup> and Cockshott and collaborators<sup>6</sup> suggested that successful malpractice actions are unlikely if physicians follow their protocols, the various screening protocols in the literature outline different significant clinical discriminators for differentiating between bony and soft-tissue injury.

High patient volume and patients' expectations also influence the emergency physician's practice. In our technologically sophisticated society, patients expect to benefit from technology. They come to the emergency department expecting to have a radiographic examination, and if their expectation is not met, they occasionally respond "If I didn't want an x-ray, I would have gone to my family doctor." In a busy emergency department one of the least rewarding and most time-consuming activities is explaining to a patient why he or she does not need a radiographic examination. This time expenditure and the ultimate lack of patient satisfaction generally sway the physician toward routine radiographic assessment.

The first step toward bringing about a change in the emergency physician's practice is to produce clinical studies that verify the role of specific signs and symptoms in the discrimination between bony and soft-tissue injuries. The next step is to address other barriers that discourage a physician from relying on clinical assessment alone.

The greatest barrier to altering practice behaviour is the doctor-patient relationship in the emergency setting. This barrier could be removed first by recognizing the problem and then, when possible, by having the patient's family doctor provide follow-up assessment of injuries that are clinically localized to soft tissues as a sensible alternative to routine radiographic assessment. This would remove some of the pressure on the emergency physician to obtain an x-ray film for such injuries. It would also allow time for underlying bony injuries (usually small avulsion fractures that require no change in management<sup>2,4</sup>) to become apparent and for most soft-tissue injuries to improve without further medical intervention. Involving the family physician in the patient's care would not only ensure more complete medical service but also save health care dollars by reducing the number of unnecessary radiographic assessments in this patient population.

The study by Drs. Beaulieu, Corriveau and Nadeau in this issue of *CMAJ* (starting on page 1003) demonstrates a creative effort to address current issues associated with acute ankle injuries. The authors attempt to resolve the problem of inconsistent results in the literature on the significance of specific signs and symptoms in the differentiation between soft-tissue and bony injuries. The study also deals with the treatment and clinical evolution of these injuries and is thus different from most studies to date. However, the methods, the way the retrospective and prospective data were combined and the inconsistency of the information in the retrospective data make it

impossible to draw any reliable conclusions from the study.

The findings of Beaulieu and colleagues are in agreement, some in part and some in whole, with previous findings and may provide direction for future research. Their conclusion that soft-tissue swelling is an indication of bony injury is in agreement with the conclusions of de Lacey and Bradbrooke,<sup>5</sup> Cockshott and collaborators,<sup>6</sup> and Garfield.<sup>7</sup> Their observation that the probability of fractures is increased with inability to bear weight, age over 40 years and direct trauma agrees in part with the results of the study by Vargish and associates.<sup>3</sup> Those results, however, do not support the conclusion that swelling corresponds to bony injury.

The consideration of treatment and the clinical evolution of these injuries in the study of Beaulieu and colleagues is an important addition to the literature. The study, however, is not as valuable for its conclusions (owing to problems in methods) as it is for its posture toward follow-up as an alternative to routine radiographic assessment. While not conclusive, it reaffirms the need for evaluation of the role of clinical examination in this patient population.

While the literature is consistent in its call for less radiographic assessment of patients with acute ankle injuries, the data are inconclusive. There is a need for further research on this subject. Until clear data are available to guide physicians in their clinical assessment, little change in practice can be expected. However, follow-up achieved through close collaboration with the patient's family doctor could reduce the number of routine radiographic examinations in patients with clinically minor injuries.

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