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Title:

- Cost-Effectiveness of Immediate MR Imaging Versus Traditional Follow-Up for Revealing Radiographically Occult Scaphoid Fractures

Objective:

- To show the advantage of MR imaging on initial presentation of suspected scaphoid fracture when no radiologic evidence is found compared to traditional immobilization and radiographic follow-up.

Materials and Methods:

- Fracture identified as linear area of low signal
  - Coronal thin-section T1-weighted MR
  - Fast spin-echo T2-weighted MR with fat saturation
- Review of literature for accuracy
  - Cases from MR imaging database from 1995-2000
    - 334 wrist studies; 17 to rule out scaphoid fracture
- Cost effectiveness

Results:

- MR imaging on initial presentation: $770
- Traditional immobilization and radiographic follow-up: $677 or more
- Positive Predictive Value of clinical exam
  - Weighted average of 21%
  - 4 of 5 patients will not have a scaphoid fracture
- Negative Predictive Value of negative initial radiographs with strong clinical suspicion
  - Weighted average of 74%
  - 3 of 4 patients will have negative findings on initial radiographs and undergo needless immobilization

Conclusion:

- Screening MR imaging recommended based on nearly equivalent cost analysis between the two protocols and loss of productivity in the immobilized group.

Discussion:

- Approximately 7% scaphoid fractures are not visible on initial radiographs
- Second follow-up appointment could cost up to $547 due to repeated diagnostic procedures and recasting
- Bone scanning is more sensitive and more specific
  - Recommended as alternative to immobilization and follow-up
  - Cost $639 approaches that of unnecessary clinical imaging and therapeutic follow-up
    - Further cost with flow studies

    - Not used in emergency room setting
    - Recent studies showing MR is more sensitive and specific (sometimes 100%)
        - Better inter-observer agreement
        - Fewer false-positive results
- Advantages of MR imaging
    - Can identify simultaneous injuries
    - Image through casting
    - Limited study can be performed in 30 minutes

Reference

http://www.ncbi.nlm.nih.gov/pubmed/11717059