

MRI for Further Evaluation of C Spine in the setting of Trauma

Do we really need it?

The Problem

- In the setting of trauma, imaging of the cervical spine (principally via computed tomography [CT]) is a key component in the trauma evaluation;
- Despite emerging literature of the high accuracy of CT to exclude even ligamentous injury (Hogan et al, Radiology, 237 (1):106-113, 2005), there are not infrequent recommendations by radiologists for further evaluation with MRI, especially in cases with pre-existing degenerative disk disease (DDD) and no comparison studies available;
- The advanced age in general of the BIDMC patient population results in a significant skewing of the patient population imaged for trauma towards one with much more prevalent DDD;
- Since MRI exams represent additional time (possibly delaying discharge) and increased health care expenditures, limiting the unnecessary use would be beneficial;

Aim/Goal

- As a Departmental Quality Improvement initiative we evaluated the rate of such recommendations made and followed in Emergency Radiology Department of BIDMC and assessed the additional diagnostic information gained by such a practice;
- We aim to collect data that will aid establishment of Departmental guidelines for appropriateness of additional imaging recommendations.

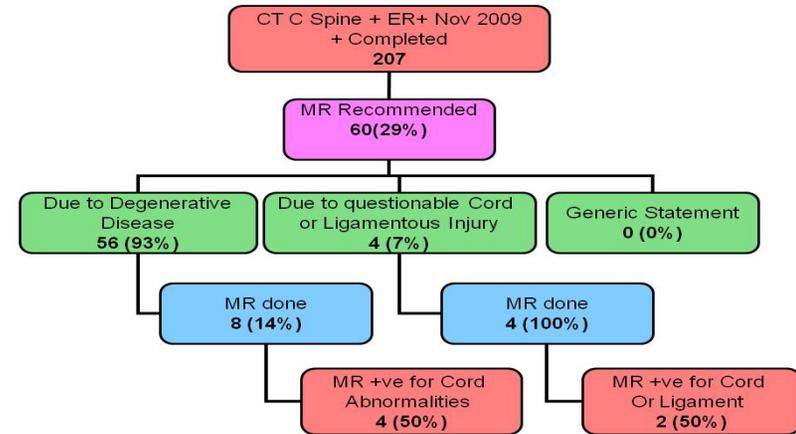
The Team *(all in BIDMC Dept of Radiology, unless stated otherwise)*

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The Interventions

- Initial analyses performed on all C spine CTs performed in the Emergency Department in the setting of trauma in the month of November 2009. Key words in Indication: MVA, Pedestrian Struck or Fall;
- Official Finalized Radiology Reports reviewed for recommendation for further MR and reasons for recommendation if indicated;
- Reviewed Imaging records as available on PACS for subsequent MRI and reported abnormalities.

Progress to Date



Lessons Learned

- Our pilot analysis demonstrated 29% recommendation rate for further imaging with MR after initial CT C Spine was performed as a part of the trauma evaluation;
- Most recommendations were made in the setting of pre-existing DDD that predisposes to cord injury and confounds the evaluation of the spinal canal;
- There was only 14% compliance with recommendations made due to pre-existing DDD versus 100% compliance with recommendations made due to questionable injuries;
- Once MRI was performed there was a 50% likelihood of cord or ligament related abnormalities.

Next Steps/What Should Happen Next

- Extend analyses to larger sample size and evaluate predictors of compliance with recommendations and abnormalities in follow-up MRI;
- Identify specific features of DDD which may improve positive predictive value minimizing unnecessary MR imaging;
- While the results of imaging studies and rate of additional diagnostic information gained is relevant, the resultant impact on patient outcome is unknown;
- As such, a further extension of the pilot data aims to couple with clinical staff in an interdisciplinary manner to help address this issue.

1. Hogan GJ, Mirvis SE, et al. Radiology. 2005 Oct; 237 (1):106-113.
2. Menaker J, Philp A, et al. J Trauma. 2008 Apr;64(4):898-903.
3. Tomycz ND, Chew BG, et al. J Trauma. 2008 May;64(5):1258-63.

