Utility of Repeat MRI in Lumbar Radiculopathy

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Background

- Inappropriate spine imaging leads to increasing health care costs and unwarranted surgeries
  - Healthcare expenditures on low back pain are ~85 billion and account for ~2% of all physician office visits
- MRI use has increased > 300% in the medicare population over a recent 12 year period
  - At least ⅓ of MRIs are felt to be unwarranted based on current practice guidelines
- Increased MRI use has not shown to improve patient outcomes and areas with higher rates of MRI have higher rates of unsuccessful surgery
- *Our study aimed to determine the utility of repeat MRI imaging for lumbar radiculopathy patients in current clinical practice*
  - *What are the common clinical indications for repeating MRI?*
  - *How often is a significant change seen?*
  - *Is there an optimal time interval to repeat imaging?*

Methods

- Retrospective review of 100 patients with repeat MRIs for lumbar radiculopathy within 5 years of each other
  - Patients excluded for trauma or surgery between MRIs and for metastatic cancer to the spine
- Chart review for:
  - Demographics
  - Comorbidities
  - Indication for MRI
  - Cumulative canal & foraminal stenosis severity scores, # of levels of stenosis, and worst stenosis severity on MRIs
    - 0 none, 1 trace, 2 mild, 3 mild-moderate, 4 moderate, 5 moderate-severe, 6 severe
    - Cumulative score = Total score for all lumbar levels combined (0-30)
  - Whether they underwent surgery or intervention after repeat MRI

Results

- 77 patients met inclusion criteria (57.1% female, mean age 58.7, mean bmi 28.2)
- Reported indications for repeat MRI:
  - 53.9% for stable persistent low back pain symptoms, 38.2% for worsening chronic low back pain, 5.3% for new acute low back pain
- Average of 30.5 months between repeat MRIs

Table 1: Comparison of Stenosis Between Initial and Repeat MRI

	Baseline	Follow up	p-value
Foraminal stenosis, Mean (SD)			
Worst severity	3.2 (1.8)	3.4 (1.9)	0.127
Severity score	6.1 (5.3)	7.2 (5.8)	0.003
Number of levels with stenosis	2.0 (1.4)	2.2 (1.4)	0.031
Spinal stenosis, Mean (SD)			
Worst severity	2.2 (2.1)	2.5 (2.1)	0.010
Severity score	3.7 (4.2)	4.5 (4.5)	0.032
Number of levels with stenosis	1.2 (1.2)	1.4 (1.3)	0.023

Results

Table 2: Association Between Worsening Stenosis on Repeat MRI and Change in Treatment

	No change in treatment		Change in treatment		p-value
Worsening of foraminal score					
					0.112
No	22	(51.2%)	21	(48.8%)	
Yes	10	(30.3%)	23	(69.7%)	
Worsening of spinal score					
					0.113
No	24	(50.0%)	24	(50.0%)	
Yes	8	(28.6%)	20	(71.4%)	

- Patients with changes in severity score of stenosis were more likely to undergo follow-up ESI, other interventional pain procedure or surgery

Conclusions

- Ordering repeat MRIs does affect clinician decision making for patients with lumbar radiculopathy
  - MRIs do change significantly over time
  - MRIs guide clinician decisions for further interventions and treatments
- Limitations of study
  - Unable to assess effect of repeat MRI on actual patient outcomes
  - Underpowered to elicit full statistical associations
- Future Directions
  - Assess clinical utility by carrying out prospective study with a control group of patients who do not get a repeat MRI

References

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