Influence of the morphology of the dural sac on surgical decision making in lumbar spinal stenosis (LSS)

Schizas Constantin, Kulik Gerit
Background

• Published evidence based guidelines:
  Exist for LSS,
  Without radiological severity thresholds

• Radiological measure of LSS:
  DSCA (dural sac area)< 100 mm$^2$ and <75mm$^2$
Grading based on the morphology of the dural sac

• **Prognostic value:** A&B no need for surgery. C&D likely to fail conservative treatment*

• **Less dependent** on image acquisition technique than surface measurements**

*Schizas et al Spine 2010
**Henderson et al ESJ 2011
Hypothesis

Surgeons base their radiological decision making on DSCA measurements

(DSCA commonest used stenosis assessment tool).
Methods

- **Internet survey:**
  Link sent to members of three national or international spine societies

- **20 images to appraise (Morphology grades range A to D):**
  1. Ten axial T2 MRI images  *Presented without DSCA*  
     (ten patients, either low back pain or LSS)
  2. Re-shuffled above MRI images  *Disclosed DSCA*  
     DSCA measurements in mm$^2$ (14 to 226 mm$^2$)

- **Outcome measure:**
  The number of surgeons who would proceed to decompression for a given *grade* or *surface area* (DSCA)
Methods

• **Additional information given:**
  1. Symptoms of neurological claudication were severe enough to warrant surgery
  2. Patients were otherwise fit for surgery

• **Statistical analysis:**
  Fisher’s exact test
Results

- **Responses:**
  137 valid = 2740 clinical scenarios for analysis

- **Physician speciality:**
  100 orthopaedic surgeons, 30 neurosurgeons, 7 others

- **Morphological classification:**
  29 came across beforehand

- **Free text remarks** (41 responders):
  Insisted on patient history & physical examination
Results

- **Operative rate of grade C:**
  Higher for neurosurgeons than orthopaedic surgeons ($p=0.0048$)

- **Operative rate of grade B:**
  57% of surgeons would operate
  88% would operate if $DSCA < 100 \text{mm}^2$
  29% would operate if $DSCA > 100 \text{mm}^2$ ($p=0.0001$)

**No influence:**
- Disclosure of $DSCA$
- Number of years in practice
- Physician density in the country of practice
- Prior knowledge of the morphological grading
Discussion

- surgeons give priority to morphology:
  Responses given to the cases of
  B grade < 100mm\(^2\) and C grade > 100mm\(^2\)

Grade B
70mm\(^2\)
OP rate: 71%

Grade C
126mm\(^2\)
OP rate: 80%
Discussion

• **B grades:**
  B grades do not seem to warrant surgery for an average period of 3.1 years

• No guidelines in surgical indication relative to radiological LSS
Discussion

• **Other factors influencing decision making:** financial, access to health resources etc.

**Present study:**
Unbiased report of current beliefs on surgical indications

• **Response rate (22%):**
Compares with others (15% surgeons, 26% paediatricians)
Methods to improve: Combine internet and surface mailing

• **Further research:**
DELPHI round or RAND UCLA
Conclusion

- Across large geographical European regions:
  Surgical decision based on morphology of the dural sac rather than the DSCA.

- Grading severity of radiological stenosis based on morphology is probably more relevant than measuring DSCA

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