

# Relaxation of the cervical spondylotic myelopathy histodynamic strain: Protocol for a retrospective cohort study addressing differences between anterior and posterior surgical approach.

<b>Submission date</b> 15/01/2016	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered
		<input type="checkbox"/> Protocol
<b>Registration date</b> 21/01/2016	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
<b>Last Edited</b> 24/03/2016	<b>Condition category</b> Musculoskeletal Diseases	<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Cervical spondylotic myelopathy (CSM) is a condition caused by the wearing down (degenerative changes) of the discs and joints in the cervical spine (neck). It is the most common cause of functional problems of the spinal cord (known as myelopathy) and it is caused by compression of the spinal cord. Expansile cervical laminoplasty (ECL) and anterior cervical corpectomy and fusion (ACCF) are two surgical procedures used to treat CSM. This study looks at data from patients that have had one of these two procedures and compares them to see which leads to the most improvement.

### Who can participate?

Adults with CSM that have had either ECL or ACCF surgery.

### What does the study involve?

This study takes data from patients that had either ECL or ACCF between 2008 and 2013, and looks at clinical findings before surgery and then two years after surgery. This includes looking at the cervical spine using kinetic magnetic resonance imaging (kMRI), comparing how well each group of patients walked before and after their surgery and the length of their spinal cord.

### What are the possible benefits and risks of participating?

Not provided at time of registration

### Where is the study run from?

University Hospital Centre Zagreb (Croatia)

### When is the study starting and how long is it expected to run for?

September 2008 to July 2016

Who is funding the study?  
Eurospine (Switzerland)

Who is the main contact?  
Professor Marin Stančić  
marin@stancic.eu

## Contact information

**Type(s)**  
Public

**Contact name**  
Prof Marin Stančić

**ORCID ID**  
<https://orcid.org/0000-0002-6169-0776>

**Contact details**  
Kišpatićeva 12  
Zagreb  
Croatia  
10000  
+38512376328  
marin@stancic.eu

## Additional identifiers

## Study information

**Scientific Title**  
Neutralization of a spondylotic cervical myelopathy dynamic compression effect: Impact of two different surgical strategies.

**Study objectives**  
Cervical spondylotic myelopathy (CSM) backward shifting and dissociation of motion noticed following expansile cervical laminoplasty (ECL) are indicators of spinal cord relaxation. However, the two phenomena are not noticed following anterior approach surgeries. Retrospective ECL and ACCF (anterior cervical corpectomy and fusion) cohorts will include patients with long tract symptoms and signs and tethering. Improvements of walking ability, spinal cord lengths (SCLs) and PEAs will be compared between ECL and ACCF group.

**Ethics approval required**  
Old ethics approval format

**Ethics approval(s)**  
Zagreb University Hospital Centre Ethics committee, 12/01/2016, ref: 02/21 AG

**Primary study design**

Observational

## Study design

Retrospective cohort study

## Study type(s)

Treatment

## Health condition(s) or problem(s) studied

Cervical spondylotic myelopathy

## Interventions

This study uses retrospective data from patients with cervical spondylotic myelopathy that had been treated with one of two surgical procedures - either expansile cervical laminoplasty or anterior cervical corpectomy and fusion - over a 5 year period starting from September 2008. This includes investigating preoperative clinical findings assessed according to Nurick scale, modified Japanese Orthopedic scale and Walking track analysis. Patients also underwent kinetic magnetic resonance imaging (kMRI); this was used for 3-D reconstruction for detecting tethering of the spinal cord and measurement of subaxial spinal cord length and Pia mater envelope area. All patients are then followed up for 2 years using the same clinical tests.

## Intervention Type

Procedure/Surgery

## Primary outcome(s)

1. Walking track time, assessed as time needed to pass 30 m with one turn, preoperative, follow-up
2. Walking track steps, assessed as number of steps needed to pass 30 m with one turn preoperative, follow-up
3. Spinal cord length (SCL), assessed as the length of the central spline of the 3-D spinal cord cylinder (SCC) rendered model
4. Pia mater envelope area (PEA), assessed as the envelope area of the 3-D SCC rendered model

Measured before surgery and at follow up.

## Key secondary outcome(s)

1. Functional disability, measured by the mJOA grade by 2 independent investigators
2. Functional disability, measured by the Nurick scale by 2 independent investigators
3. Backward shift, comparing between preop (before surgery) and follow-up MRIs
4. Subsidence, comparison between preop and follow-up MRIs

Measured before surgery and at follow up.

## Completion date

01/07/2016

## Eligibility

### Key inclusion criteria

#### 1. Clinical inclusion criteria:

CSM classified as Nurick 3-5 in whom left sided C3-C7 open door ECL or ACCF were done for decompression

2. Radiological inclusion criteria were preoperative tethering detected by kMRI 3-D reconstructions. In addition, the patients' postdecompression spinal cords were untethered, spinal cord shifted backward and the spinal cords dissociated motion from vertebral canal. Spinal cord and brainstem transverse sections obtained from kMRI were used to render 3-D reconstructions of lower part of the brainstem and cervical and upper thoracic spinal cord. Pons to T5/T6 models were used according to the following criteria:

3. Spinal cord tethering: At the point of maximum compression canal compromise is graded 3 (pincer effect); through extension to flexion neck movement the two separate segments of the spinal cord changes the length. Pincer effect divides this two segment.

4. Spinal cord untethering and dissociation of motion: The spinal cord and subarchnoidal space are without compression and therefore graded as 0. The spinal cord homogeneously increases its length from extension to flexion. Preoperative spinal cord 3-D model represents original spinal canal and is compared with postoperative. Dissociation of motion is considered when postoperative 3-D model does not cover pre-opartative, but is shorter and less curly.

5. Backward shift: Preoperative subaxial spinal cord central spline was superposed on the central spline created on the postoperative images. Backward shift is considered when instead of superposing of two lines the postoperative central spline is placed porsterior to the preoperative

#### **Participant type(s)**

Patient

#### **Healthy volunteers allowed**

No

#### **Age group**

Senior

#### **Sex**

All

#### **Key exclusion criteria**

Patients with:

1. Kyphosis more than 10 degrees
2. Instability
3. Metabolic or inflammatory bone disease
4. Tumor
5. Multiple sclerosis
6. Anterolateral sclerosis
7. Toxic-metabolic myelopathies

#### **Date of first enrolment**

01/09/2008

#### **Date of final enrolment**

31/08/2013

#### **Locations**

## Countries of recruitment

Croatia

## Study participating centre

University Hospital Centre Zagreb

Kišpatićeva 12

Zagreb

Croatia

10000

## Sponsor information

### Organisation

University Hospital Centre Zagreb

### ROR

<https://ror.org/00r9vb833>

## Funder(s)

### Funder type

Government

### Funder Name

Eurospine (Switzerland)

## Results and Publications

### Individual participant data (IPD) sharing plan

### IPD sharing plan summary

Data sharing statement to be made available at a later date