

SPINAL FUSION OVER SIMPLE DECOMPRESSION FOR DEGENERATIVE LUMBAR SPONDYLOLISTHESIS: WHICH PATIENT GROUPS BENEFIT MORE?

Ananyo Bagchi¹, Marco Teli², Simon Clark²,
Martin Wilby²

- 1) Department of General Surgery, Aintree University Hospital NHS Foundation Trust, Liverpool
- 2) Department of Neurosurgery, The Walton Centre NHS Foundation Trust, Liverpool



Introduction

- ▶ Degenerative spondylolisthesis is vertebral displacement associated with degenerative disc and facet joint changes.
- ▶ Operative management includes decompressive surgery with or without spinal fusion at the affected level.
- ▶ There is no established consensus over which approach delivers superior patient outcomes, which can be measured by the Core Outcome Measures Index (COMI).
- ▶ The COMI is a useful instrument employed to monitor the patient's perspective of outcomes post spinal surgery. It takes into account intensity of pain, function, general quality of life, work and social disability.

Purpose

- ▶ To identify patient groups which are more likely to gain significantly greater symptomatic relief with spinal fusion compared to decompression alone for degenerative lumbar spondylolisthesis.

Method

- ▶ Records from the Spine Tango database for patients who underwent surgical intervention for degenerative lumbar spondylolisthesis at the Walton Centre for Neurology and Neurosurgery between 24 December 2015 and 8 January 2018 were extracted.
- ▶ Patients were stratified according to the intervention they had undergone and their demographic and clinical details.
- ▶ Improvements in COMI score at 3 months and 12 months postoperatively compared to preoperative scores were calculated.
- ▶ Univariate analysis was carried out using SPSS software (Fisher's exact test).

Results (1)

At 3 month follow up

Patient sub-group	Decompressive Surgery only		Fusion± decompressive surgery		P
	No. of patients	Improvement in COMI score	No. of patients	Improvement in COMI score	
Overall	37	3.41±2.72	80	3.49±2.50	0.891
Gender					
Male	16	3.77±2.90	30	2.91±2.75	0.340
Female	21	3.14±2.62	50	3.83±2.29	0.303
Age at time of operation					
<50	1	0.05	21	3.49±1.96	0.102
>50	36	3.51±2.70	59	3.48±2.68	0.971

At 12 month follow up

Patient sub-group	Decompressive Surgery only		Fusion± decompressive surgery		P
	No. of patients	Improvement in COMI score	No. of patients	Improvement in COMI score	
Overall	28	4.54±3.25	50	3.82 ±2.74	0.326
Gender					
Male	11	5.99±2.99	20	3.70±3.16	0.061
Female	17	3.63±3.16	30	3.91±2.48	0.754
Age at time of operation					
<50	1	1.30	11	4.08±3.07	0.407
>50	27	4.66±3.25	39	3.75±2.68	0.217

Results (2)

At 3 month follow up

Patient sub-group	Decompressive Surgery only		Fusion± decompressive surgery		P
	No. of patients	Improvement in COMI score	No. of patients	Improvement in COMI score	
Associated Pathology					
Disc herniation	3	4.55±3.90	17	3.81±2.66	0.744
Central stenosis	21	3.23±1.92	25	3.13±2.11	0.869
Lateral stenosis	21	4.40±2.49	27	3.61±2.38	0.279
Foraminal stenosis	10	4.14±3.19	22	2.86±2.20	0.272
Degenerative disc disease	2	1.28±2.09	6	1.93±2.54	0.751
Facet joint arthrosis	7	5.34±2.34	2	2.00±2.83	0.312
Spondylolisthesis grade					
0	3	1.15±1.81	0	-	-
I	31	3.43±2.72	65	3.46±2.55	0.955
II	3	5.50±2.38	14	3.55±2.42	0.225
III	0	-	1	4	-
IV	0	-	0	-	-
Spondyloptosis (V)	0	-	0	-	-
Previous treatment					
None	16	3.02±2.46	22	3.46±2.56	0.596
Surgical	2	1.70±1.84	4	4.64±3.17	0.233
Conservative <3/12	1	0.95	4	4.61±3.19	0.380
Conservative 3-6/12	2	3.1±0.42	9	2.51±2.18	0.474
Conservative 6-12/12	10	3.95±3.79	19	3.89±2.80	0.9678
Conservative > 12/12	7	4.12±2.20	25	3.26±2.23	0.384

At 12 month follow up

Patient sub-group	Decompressive Surgery only		Fusion± decompressive surgery		P
	No. of patients	Improvement in COMI score	No. of patients	Improvement in COMI score	
Associated Pathology					
Disc herniation	2	0.15±1.63	11	5.27±2.18	0.048
Central stenosis	21	3.81±2.94	12	4.15±2.59	0.736
Lateral stenosis	14	5.90±3.37	17	4.48±2.32	0.193
Foraminal stenosis	7	7.2±2.17	14	3.55±2.62	0.004
Degenerative disc disease	1	4.20	5	4.34±2.55	0.962
Facet joint arthrosis	4	6.71±3.11	1	-0.1	0.145
Spondylolisthesis grade					
0	3	1.58±1.35	0	-	-
I	22	5.01±3.08	40	3.90±2.89	0.171
II	3	4.08±5.03	9	3.91±2.21	0.931
III	0	-	1	-0.1	-
IV	0	-	0	-	-
Spondyloptosis (V)	0	-	0	-	-
Previous treatment					
None	14	4.45±3.66	13	4.36±2.98	0.946
Surgical	2	1.20±1.13	3	3.30±3.39	0.404
Conservative <3/12	1	1.00	4	5.96±2.37	0.159
Conservative 3-6/12	3	6.50±1.41	6	1.98±2.71	0.014
Conservative 6-12/12	3	8.33±1.01	10	3.39±2.82	0.001
Conservative > 12/12	6	3.01±1.59	17	3.69±2.33	0.443

Results- summary

- ▶ There was no overall significant difference in improvement of COMI scores at 3 months and 12 months postoperatively between patients who underwent spinal fusion compared to decompression alone.
- ▶ Patients undergoing spinal fusion had significantly higher reductions in COMI score at their 12-month follow-up if they had associated disc herniation at time of presentation.
- ▶ Benefit from spinal fusion at 12 months was significantly poorer than from decompressive surgery alone in patients who had foraminal stenosis pre-operatively and those who had 3-12 months of conservative management prior to surgical intervention.

Conclusions

- ▶ Spinal fusion may not be the only choice of treatment for certain patient groups with degenerative spondylolisthesis and should not be always favoured above simple decompressive surgery as the latter has safe and equivocal clinical outcomes .
- ▶ Further high-quality studies have to need to be carried out to definitively identify characteristics of patients who are likely to gain greater benefit from spinal fusion and we would suggest this subject form the basis of a clinical trial.

Disclosure

- No conflicts of interest to disclose