Lumbar Spinal Stenosis Study Associates Surgical Decompression with Improved Low Back Pain

By: Terry Stanton (/search.aspx?id=32&srchtext=Terry+Stanton)

A study examining the effect of surgical lumbar decompression on low back pain (LBP) in patients with lumbar spinal stenosis (LSS) found that the surgical intervention significantly improved pain at three months, which was maintained 12 and 24 months after surgery in most patients.

The study, presented at the National Association of Spine Surgeons Annual Meeting by Nicolas Dea, MD, MSc, FRCSC, of the neurosurgery division at the University of British Columbia in Canada, was a multicenter, ambispective review of 1,221 spine surgery patients enrolled by the Canadian Spine Outcomes and Research Network (CSORN) between 2014 and 2017. CSORN is a group of more than 50 neurosurgical and orthopaedic spine surgeons from 18 tertiary care academic and nonacademic hospitals across Canada that prospectively collects data on patients with spinal conditions. The database serves as a national registry to help answer research questions and facilitate the implementation of best practices.

The study group comprised consecutive patients who underwent surgical treatment for LSS without instability (level 1–2) at every participating site. The type of surgical intervention was decided by the treating surgeon and included decompression with or without fusion via an open or minimally invasive approach.

Mean age was 63.9 years, and 58 percent of patients were male. Baseline back pain scores were available in 1,133 patients, and follow-up evaluations were available in 968 of those patients (85 percent) at three months, 649 of 903 (72 percent) at 12 months, and 331 of 454 (73 percent) at 24 months. Surgical intervention was predominantly decompression alone (72 percent), but fusion was added in 26 percent of patients. An open approach was employed more often than a minimally invasive approach.

TABLE 1: PATIENT FACTORS INFLUENCING LOWER BACK PAIN

	University Education			NO Claims			NO Narcotics			Health State score			ODI Scores			Severity of LBP		
	Sig	95% CI		Sig	95% CI		Sig	95% CI		Sig	95% CI		Sig	95% CI		Sig	95% CI	
3 months		Upper	Lower		Upper	Lower		Upper	Lower		Upper	Lower		Upper	Lower		Upper	Lower
	.003	1.2	3.2	.068	0.96	3.11	.004	1.2	3.4	.10	0.99	1.02	.014	1.01	1.04	.00	1.523	1.899
12 months				.03	1.04	3.96										.00	1.41	1.82
24 months				.039	1.06	14.3	0.13	0.75	7.8							.00		2.00

Larger image (PDF) (/uploadedFiles/Periodical_Content/AAOSNow/2019/Jan/clinical/article_images/clinical03_t1.pdf)
Courtesy of Vancouver Spine Surgery Institute

Sustained improvement

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The primary outcome measure was a change in LBP as measured by a numeric rating scale (NRS). The investigators found that LBP significantly improved three months after surgery and was sustained at 24 months ($P < 0.001$). Seventy-four percent of patients reached the minimal clinically important difference (MCID) with regard to back pain NRS score at three months postoperatively, and 68 percent remained clinically significantly improved after two years of treatment. The proportion of patients who had no or minimal residual back pain (NRS 0–2) also improved significantly, from 7.5 percent at baseline to 46.4 percent at 12 months and 40.9 percent at 24 months, although a higher number of patients reached the MCID for leg pain than for back pain. At three months, 82.3 percent of patients who had improvement of their leg symptoms also had back pain improvement reaching MCID, and that proportion remained similar at 24 months.

Patient factors that were associated with a higher likelihood of reaching MCID for LBP at three, 12, and 24 months postoperatively were absence of narcotic usage, absence of any compensation claims, and increasing LBP severity prior to surgery (high NRS) (Table 1). Other factors such as college education and better health state score seemed to be associated with improvement in LBP at three months but lost significance at longer follow-up. The type of surgical intervention, the occurrence of intra- or postoperative adverse events, surgical time, or length of stay had no predictive value in the change in back pain scores.

The authors wrote: "Because we considered the change in NRS as opposed to the actual scores, we obtained a more accurate estimate of the treatment effect irrespective of baseline."

Dr. Dea noted that the usual goal of surgery for lumbar stenosis is to address neurogenic claudication in order to improve walking distance and leg pain. "Improvement in back pain is considered unreliable," the authors wrote, "and patients are usually cautioned about their expectations around LBP improvement. In this study, more than three-quarters of patients who had significant leg pain relief had back pain relief as well, verifying that surgical decompression yields better results for leg symptoms than for back pain, but revealing an associated improvement of back pain. Currently available data about LBP improvement is from long-term observational and randomized, controlled trials (RCTs) where the effect of surgical intervention on LBP was usually a secondary outcome measure. In addition, standardized measures of low back pain were lacking and inconsistent."

The presence of significant LBP usually is considered a predictor of poor outcome after surgery for LSS, the authors noted. However, "we found that increased severity of back pain at baseline seemed to be associated with a higher likelihood of reaching the MCID for LBP improvement at both early and late follow-up. It is possible that the benefit of surgical intervention for reducing back pain is highest for patients with worse baseline scores, although this may also reflect a ceiling effect conferred by low NRS scores or a regression toward the mean phenomenon."

Addressing the finding of an association between MCID back pain improvement and the absence of narcotic usage, the authors observed: "There has been recent concern about increased use of opioid analgesia in the treatment of chronic pain not related to cancer. Large population-based studies have found that users of opioid analgesia tend to have a poor health-related quality of life and show poor recovery from any therapeutic intervention. However, long-term longitudinal studies analyzing the effect of opioid usage and recovery from chronic pain are lacking." They also noted that patients with opioid dependence who are on workers compensation have generally poorer outcomes after surgery.

Conclusion

Summarizing the noteworthy findings of the study, Dr. Dea said, "Improvement in back pain as a primary outcome measure has not been investigated so far. In fact, it is usually accepted that, despite adequate surgical treatment, residual back pain is the rule. However, with this study, we are able to show that there is significant improvement in back pain after surgery for lumbar spine stenosis, and this is maintained for up to two years after the procedure."

He added that use of prospectively collected data from CSORN "allows us to report on care as actually provided without rigid inclusion and exclusion criteria. The results of this study are thus representative of real-life clinical practice and complement data from RCTs and other observational studies. Ultimately, this helps surgeons to manage patient expectations and counsel them about potential effects of surgical intervention on their symptoms."

The clinical takeaway, according to Dr. Dea: "Based on the results of this study, surgeons can tell their patients that they have a 74 percent chance of achieving a clinically meaningful reduction in their back pain following surgical intervention for lumbar stenosis. Also, we found no significant correlation with type of surgical procedure performed and LBP improvement."

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