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Opioid Usage and Clinical Outcomes After Minimally Invasive Surgery (MIS) Versus Open Lumbar Fusions

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Opioid Usage and Clinical Outcomes After Minimally Invasive Surgery (MIS) Versus Open Lumbar Fusions

Introduction:

Minimally invasive (MIS) lumbar fusion surgery continues to gain popularity with promising clinical results, such as better functional mobility, and decreased hospital stay. As being opioid-naive has been described as a protective risk factor for postoperative opioid consumption, the objective of this study is to determine the differences in long-term opioid usage between Minimally Invasive Transforaminal Lumbar Interbody Fusion (MIS TLIF) versus traditional open lumbar interbody fusions. We hypothesize that patients undergoing MIS surgery will have a greater degree of pain control compared to open surgical cases.

Methods:

All lumbar fusion surgeries performed between 2019 and 2021 were reviewed independently for opioid morphine milliequivalent (MME) requirements from 6 months pre-operatively to 1 year post-operatively. The Michigan Spine Surgery Improvement Collaborative (MSSIC) was utilized for all patient outcomes.

Results:

Of the 292 patients included, 71 patients had MIS-TLIF while 221 patients underwent open lumbar interbody fusions. 66 (23%) had at least one opioid prescription 6-12 months post-surgery. There were no differences in opioid prescription rates between the two groups. Among patients with an opioid prescription, MIS-TLIF patients had lower daily MMEs when compared to open cases at 6-12 months post-surgery ($p=0.048$). Patients with opioid prescriptions also had higher rates of DVT, history of depression, history of anxiety, COPD, PHQ2 depression at baseline, reported pre-op daily use of opioids, longer duration of symptoms and lower baseline PROMIS physical function scores. No statistically significant differences were observed for patient satisfaction at 1 & 2 years or MCID PROMIS at 90 days and 1 year after surgery. Length-of-surgery, estimated blood loss, and length-of-hospital stay were significantly lower for MIS TLIF compared to open surgery.

Conclusion:

Although there were no differences in opioid prescription rates, the daily opioid consumption of 6-12 months after surgery was lower for MIS-TLIF cases. There were no differences in long-term functional outcomes between open and MIS-TLIF surgeries.

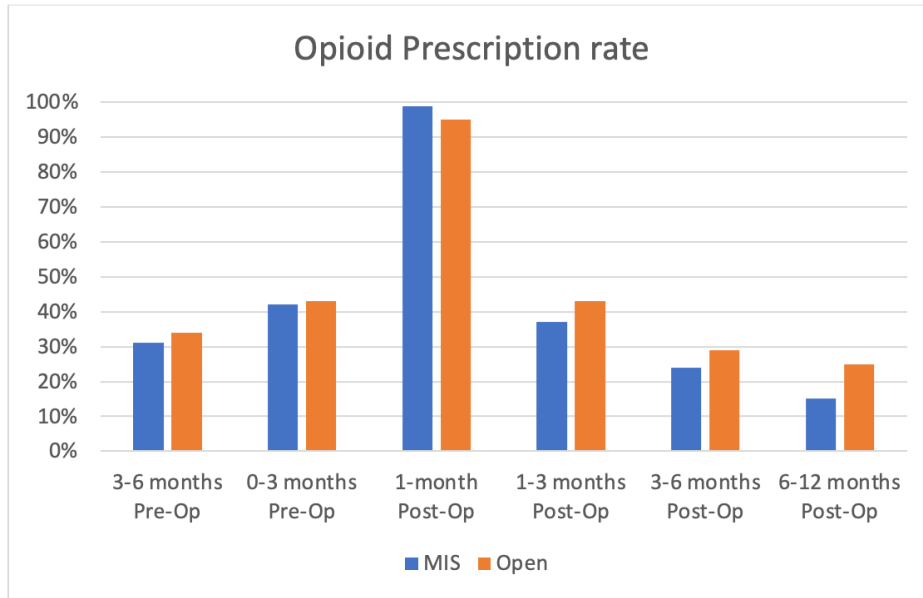


Figure 1. Opioid prescription rate between MIS-TLIF and Open lumbar fusions. No statistically significant difference was observed between the two groups.

Time	MIS			Open			p-value
	N	Median	IQR	N	Median	IQR	
Pre-op 3-6 months	22	0.34	0.22, 0.05	75	0.36	0.22, 0.6	0.639
Pre-op 0-3 months	30	0.25	0.17, 0.43	94	0.33	0.19, 0.53	0.290
Post-op 1 month	70	2	1, 3.125	211	2.33	1.5, 3.58	0.162
Post-op 1-3 months	26	0.7	0.33, 1.17	94	0.65	0.31, 1	0.391
Post-op 3-6 months	17	0.47	0.21, 0.67	64	0.33	0.17, 0.625	0.301
Post-op 6-12 months	11	0.17	0.15, 0.25	55	0.375	0.17, 0.67	0.048

Table 1. Comparing daily MME between MIS-TLIF and Open lumbar fusion surgeries for patients with an Opioid prescription at various peri-operative periods. The number of patients, median MME and interquartile range was noted.

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