

MINIMALLY INVASIVE SURGERY: VALUE OF MIS TLIF FOR ELECTIVE SPINE SURGERIES AFTER COVID-19

DISCUSSION

COVID-19 was declared a pandemic on March 13th, 2020, where Canada saw its first case in early January 2020 and has since rapidly increased to 117,939 cases and 9,154 deaths in Canada by August (Government of Canada). One of the impacts of COVID-19 is the cancellation of elective surgeries globally in the interest of minimizing community spread of the virus. In Canada, one study estimated that over 32,000 elective surgeries would be cancelled per week during the peak of COVID-19 (CovidSurg Collaborative et al 2020).

Spine procedures are one of many disciplines in Canada that have been impacted by COVID-19, resulting in significant cancellations of elective spine procedures (El Holou, 2020; Ghogawala et al, 2020). The North American Spine Society and others have developed guidelines on how to triage which spine procedures are emergent or elective (Bono et al, 2020; Donnally et al, 2020). Scheduled or elective surgery is typically for patients whose symptoms are not reasonably managed without the procedure and have failed all reasonable conservative treatment for extended periods of time (North American Society 2020).

It is reasonable to assume that in the future, hospitals will resume these elective spine procedures, and may be faced with a surplus of elective spine procedures due to COVID-19. Therefore, it will be important to consider surgical techniques that will allow efficient treatment with rapid recoveries for patients, without compromising their care, as to address this surplus of elective spine procedures.

Minimally invasive surgeries (MIS) for spine are procedures that aim to accomplish the same operative goals as traditional open spine surgeries which may be relevant to COVID-19. Systematic review and meta-analyses by Dr. Raja Rampersaud from Canada have suggested equipoise to some benefits of MIS compared to open surgery including complication rates, operative time, estimated blood loss, and length of stay (Goldstein et al, 2014, 2016a, 2016b). Recent meta-analyses from 2018 onwards comparing MIS transforaminal lumbar interbody fusion (TLIF) to traditional open TLIF suggest some benefits of MIS TLIF (Table 1). In general, MIS TLIF may offer reduced length of stay (LOS) and blood loss (BL). MIS TLIF may also offer similar or improved outcomes to open TLIF when it comes to procedure / operating room (OR) time, complication rates, and clinical outcomes (pain and disability). The main drawback of MIS TLIF is the potential increase in radiation exposure to the hospital staff and patient. The reduction in LOS, without significantly compromising patient care, is particularly relevant for hospitals looking to reduce the surplus of elective spine procedures due to COVID-19 to ensure hospital resources are kept minimal.

Altogether, MIS TLIF may be an attractive alternative compared to traditional open TLIF in shortening patient hospital stay which may free up critical resource for hospitals as they resume elective spine procedures after COVID-19.



SHORTER LENGTH OF STAY



IMPROVED PATIENT SATISFACTION

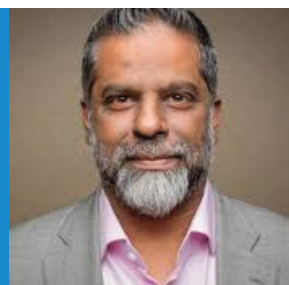


DECREASED BLOOD LOSS

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Paper	Pathology	Studies Analyzed	MIS TLIF Compared to Open TLIF						
			LOS (Days)	BL (ml)	Complication Rate	OR Time (min)	VAS	ODI	Radiation Exp (sec)
Chen 2019	Degenerative Lumbar Diseases	Non-randomized trials (n = 10)	↓	↓	↓	n.s.	n.s.	n.s.	N/A
Hammad 2019	All TLIF spine procedures	Trials (n = 32) included prospective (n = 18), retrospective (n = 13), RCT (n = 1). MIS TLIF (n = 1,285) Open TLIF (n = 1,100)	↓ Mean 5.05 vs 6.92	↓ Mean 247.82 vs 568.18	n.s. 11.3% vs 14.2%	n.s. Mean 214.69 vs 198.03	n.s.	n.s.	↑ Mean 65.4 vs 28.3
Li 2018	Single level degenerative lumbar diseases	RCTs (n = 7)	n.s. WMD -1.63	↓ WMD -291.46	N/A	n.s. WMD -12.89	n.s. WMD -0.19	n.s. WMD 0.20	↑ WMD 35.79
Miller 2020	Single level degenerative lumbar diseases	RCTs (n = 7) MIS TLIF (n = 246) Open TLIF (n = 250)	↓ MD -2.2	↓ MD -200	n.s.	n.s. MD -4	n.s. MD -1	↓ MD -3	↑ MD 48
Qin 2018	Single-Level Spondylolisthesis Grades 1 and 2	Trials (n = 6) included RCTs (n = 2), prospective / retrospective (n = 4) MIS TLIF (n = 182) Open TLIF (n = 212)	↓ WMD -2.15	↓ WMD -281.75	n.s.	↑ WMD 18.04	n.s. WMD -0.35	↓ WMD -1.59	N/A

Summary of meta-analyses comparing MIS TLIF to open TLIF since 2018. LOS, length of stay; BL, blood loss; OR, operating room; VAS, visual analog score; ODI, Oswestry Disability Index score; WMD, weighted mean difference; MD, mean difference.



“MIS can offer improved perioperative clinical outcomes with possible fewer complications, equivalent or improved intermediate patient reported outcomes, and decreased hospital costs by up to 49%.”

Dr. Y. Raja Rampersaud
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