

Project Title

Results of Open, Tubular and Bi-Portal Endoscopic Decompression for Lumbar Spine Degenerative Disorders - A Regional Hospital Experience

Project Lead and Members

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Organisation(s) Involved

National Healthcare Group institutions – Khoo Teck Puat Hospital, Woodlands Health

Healthcare Family Group(s) Involved in this Project

Medical

Applicable Specialty or Discipline

Orthopaedic, General Surgery

Project Period

Start date: January 2021

Completed date: May 2022

Aims

We aim to review the results of lumbar spine decompression surgeries across open discectomy/decompression (OD), tubular microdiscectomy/decompression (TM), and biportal endoscopic discectomy/decompression (BE) in our hospital.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

Bi-portal endoscopic spine surgery is a relatively new technique to local spine surgeons and its efficacy and safety profile against existing surgical techniques should be established for our population. We found no difference in efficacy between the 3 different surgical techniques to address lumbar degenerative disorders and they had similar complication rates in the short-term follow-up. The advantage of having the shortest length of stay compared to current established surgical techniques is consistent with published literature from other spine centres internationally. Additional costs of equipment for this technique has to be taken into account in the climate of value-driven care and the future direction to investigate cost-effectiveness should be considered.

Conclusion

See poster appended/ below

Additional Information

Singapore Health & Biomedical Congress (SHBC) 2022: Singapore Young Investigator Award (Clinical Research) (Oral category)– (Bronze Award)

Project Category

Applied/ Translational Research

Quantitative Research

Care & Process Redesign

Value Based Care, Length of Stay

Keywords

Evaluation Research, Endoscopes, Lumbar Spine Decompression Surgery, Bi-Portal Endoscopic (BE) Spine Surgery, Open Discectomy/Decompression (OD), Tubular Microdiscectomy/Decompression (TM)

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Results of Open, Tubular and Bi-Portal Endoscopic Decompression for Lumbar Spine Degenerative Disorders - A Regional Hospital Experience

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INTRODUCTION

Endoscopic spine surgery to address lumbar degenerative conditions receives increasing attention and is postulated to offer advantages over existing techniques. A steep learning curve deters its uptake but bi-portal endoscopic techniques¹ may offer a more intuitive approach to utilize advantages of endoscopic spine surgery.



AIM

We aim to review the results of lumbar spine decompression surgeries across open discectomy/decompression (OD), tubular microdiscectomy/decompression (TM)², and biportal endoscopic discectomy/decompression (BE) in our hospital.

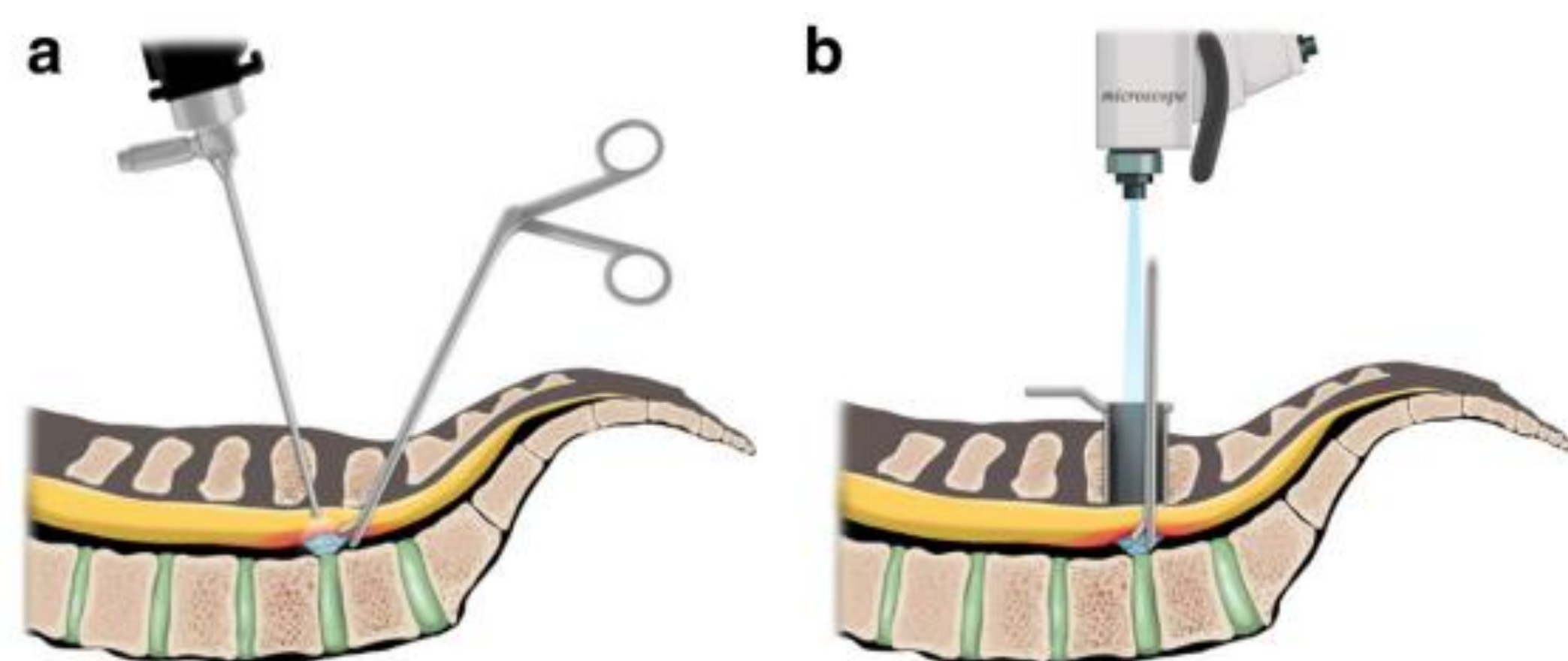


Illustration of **a** unilateral biportal endoscopic discectomy and **b** open microscopic discectomy

METHODOLOGY

Patients were screened from caselog of spine surgeons in our hospital from January 2021 to May 2022 for lumbar spine degenerative disorders and underwent decompression surgeries, which were categorized into discectomy, single-level and double-level decompression. Data analysis was performed using SPSS.

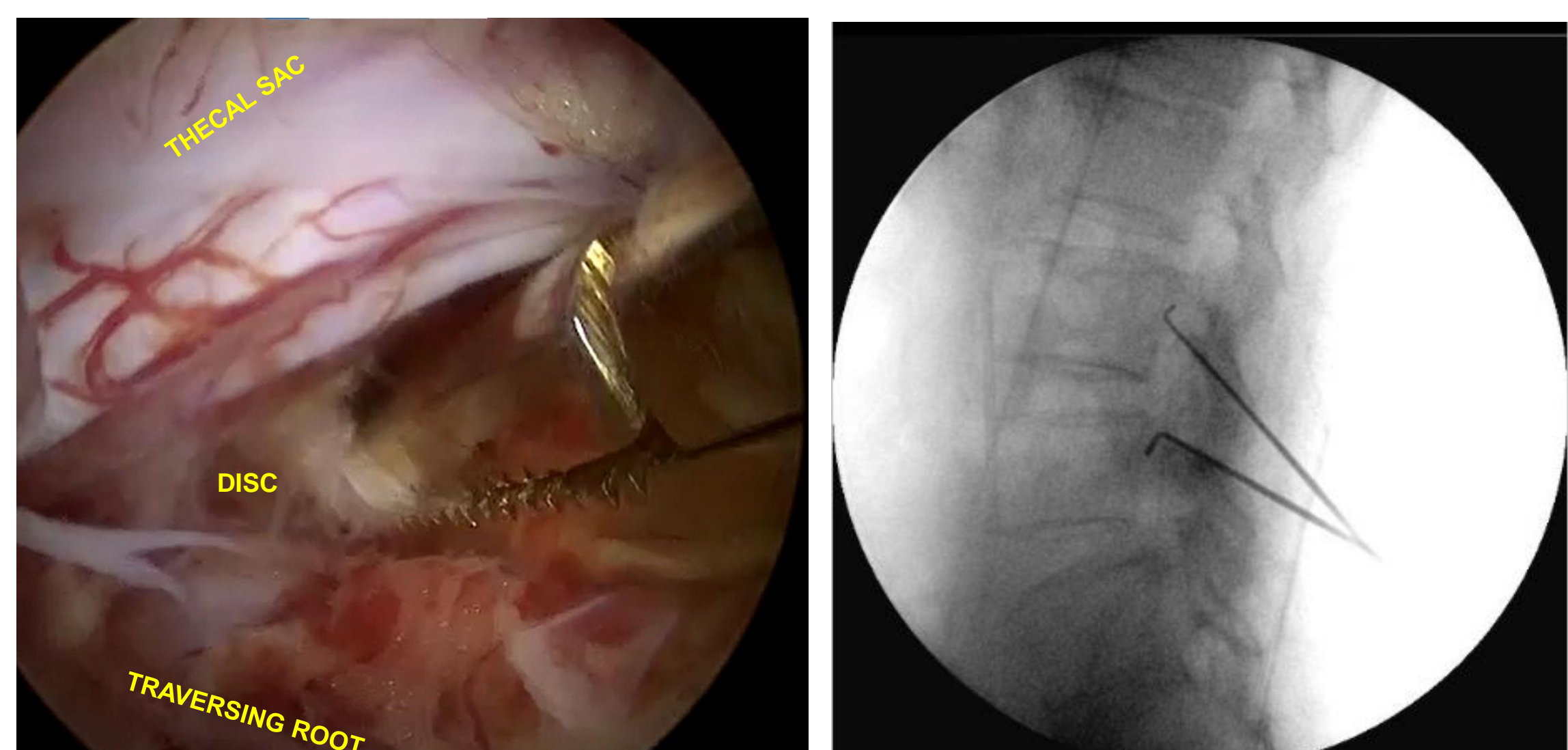
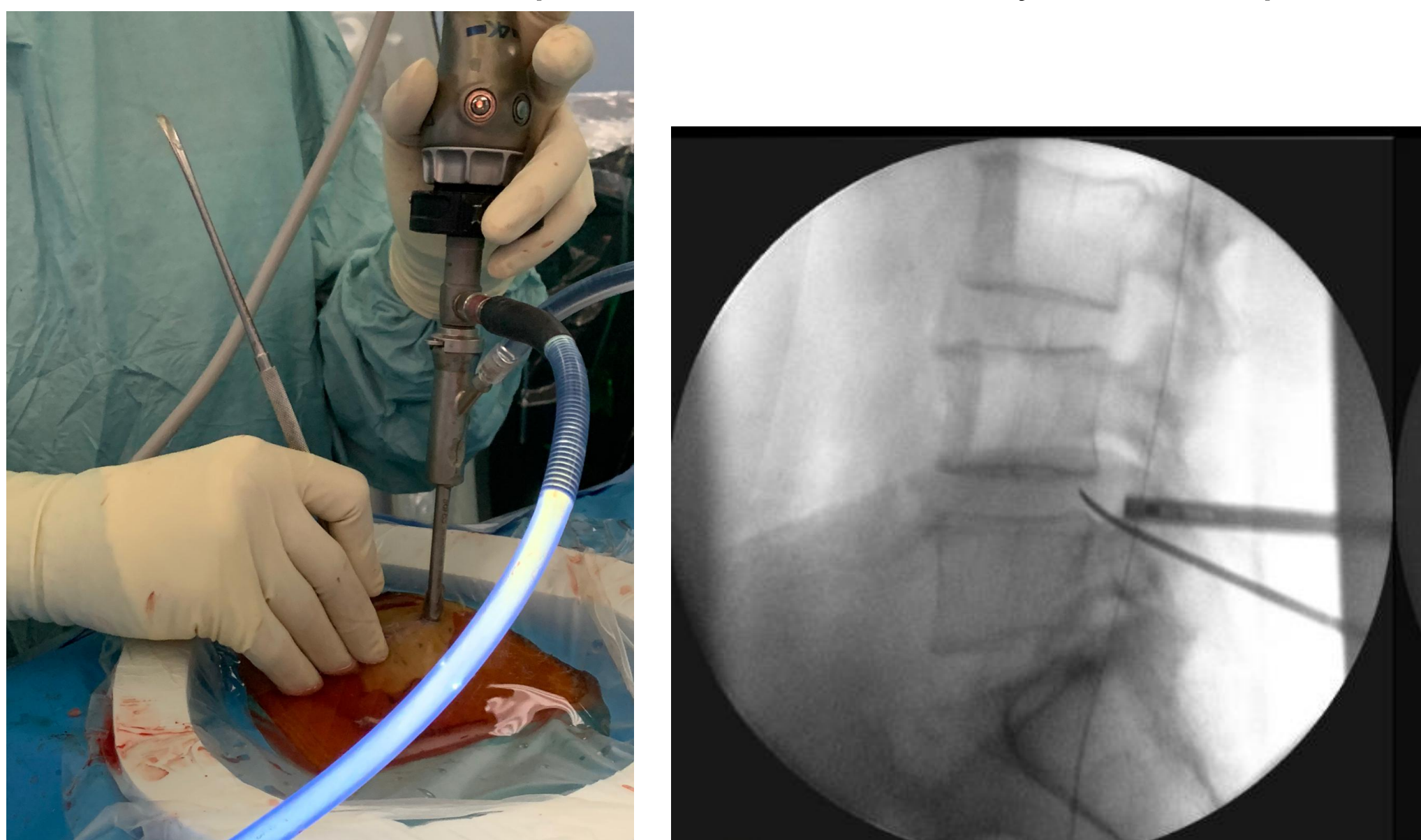


Figure 1 shows (top-left) pen-field dissector and 0-degree endoscopic usage through two incisions, (top-right) lateral radiograph shows dissector at L4-5 disc space, (bottom-right) lateral radiograph shows decompression from L3 pedicle to L4 pedicle, (bottom-left) endoscopic view of disc retrieval via nerve root axilla.

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- HOD, Department of General Surgery, Khoo Teck Puat Hospital

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RESULTS

Seventy-eight patients were included with mean age of 55.8, 52.2 and 54.6 years in those who underwent OD, TM and BE respectively. Most of 8 OD (50%) were performed for double-level decompression, while 44.4% of 36 TM and 41.2% of 34 BE were for discectomies. Duration of surgery for discectomies were 3h 41m, 2h 10m, 2h 41m for OD, TM and BE respectively. For single-level decompression, it was 3h 20m, 3h 19m and 3h 9m, and for double-level decompression it was 4h 15m, 3h 44m and 4h 45m. Length of stay was 2.9 days for BE, compared to 3.9 days for TM and 7.6 days for OD with statistical significance ($p = 0.014$). Change of pain score for back and leg pain across the 3 techniques was not statistically significant. Complication rates were similar between TM (17.6%) and BE (13.9%).

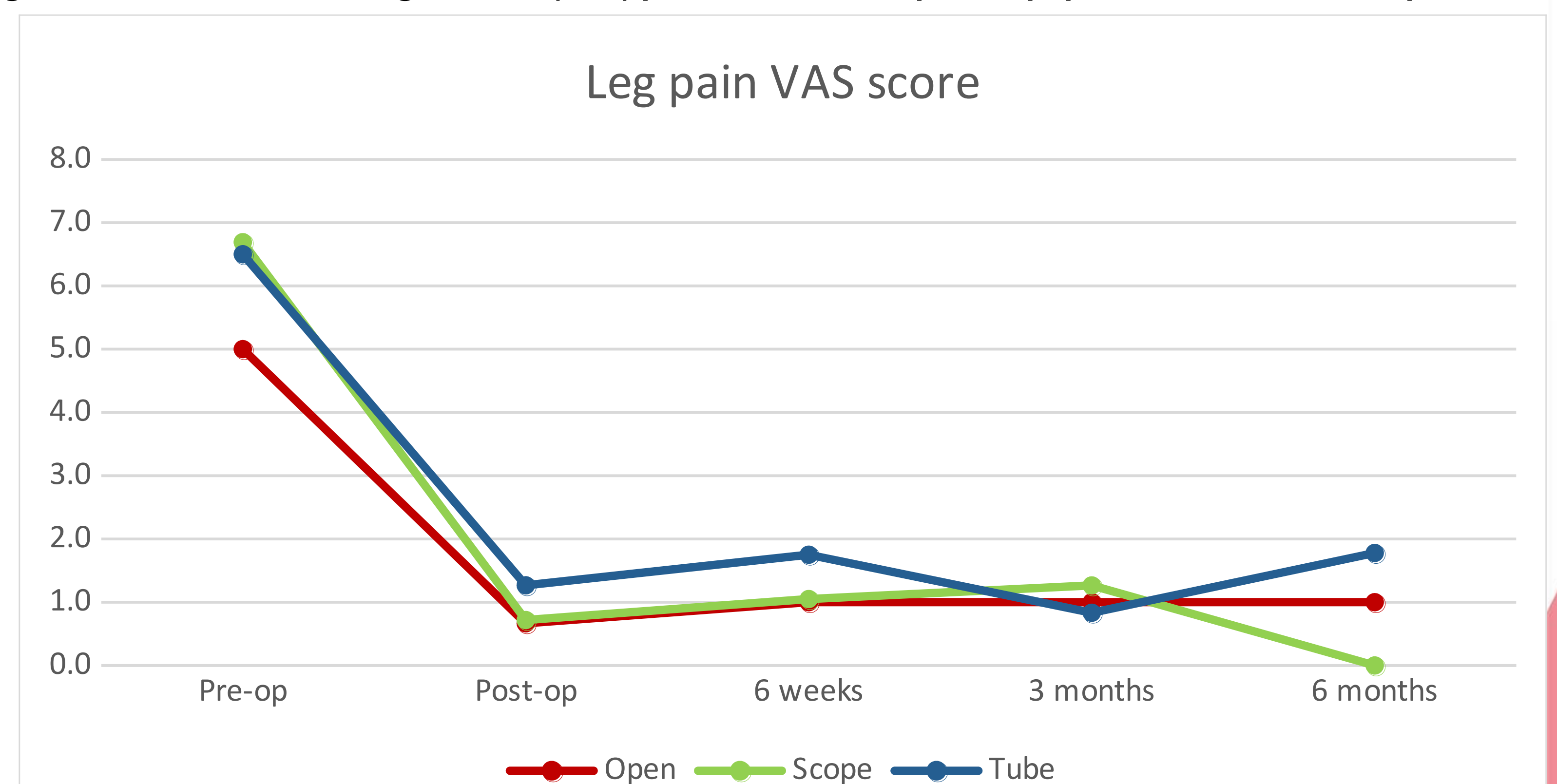
Table 1 shows characteristics of patient populations undergoing open, tubular and biportal endoscopic decompression.

Decompression Technique	Open (OD)	Tubular (TM)	Biportal Endoscopic (BE)	Test of significance, p
Number of cases, N	8	34	36	N.A.
Mean Age (years)	55.8	54.6	52.2	0.74
Pathology				0.15
Discectomy, n (%)	1 (12.5)	16 (44.4)	14 (41.2)	
Single-level stenosis, n (%)	2 (25.0)	13 (35.9)	13 (38.2)	
Double-level stenosis, n (%)	4 (50.0)	6 (16.7)	7 (20.6)	

Table 2 shows outcomes of patient populations.

Decompression Technique	Open (OD)	Tubular (TM)	Biportal Endoscopic (BE)	Test of significance, p
Duration of surgery				
Discectomy	3h 42min	2h 10min	2h 41min	0.06
Single-level stenosis	3h 20min	3h 19min	3h 09min	0.91
Double-level stenosis	4h 15min	3h 44min	4h 45min	0.23
Length of stay (days)	7.6	3.8	2.9	0.01
Number of complications, n (%)	1 (12.5)	5 (13.9)	6 (17.6)	0.884

Figure 2 shows Visual Analogue Scale (VAS) pain score across patient populations over follow-up.



CONCLUSION

There was no difference in efficacy between the 3 different surgical techniques to address lumbar degenerative disorders with similar complication rates. BE spine surgery had the shortest length of stay and might offer potential advantages compared to current established surgical techniques..

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