ORIGINAL RESEARCH PAPER
Volume - 15 | Issue - 04 | April - 2026 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

OUTCOMES OF THREE DIFFERENT KINDS OF MINIMAL INVASIVE SPINAL DECOMPRESSION TECHNIQUES IN LUMBAR CANAL STENOSIS

Orthopaedics

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KEYWORDS

Objective:-
- Assessment of effects of 3 different surgical approaches for spinal decompression in degenerative lumbar canal stenosis involving multiple level with no instability

Method:-
- 51 patient's with degenerative LCS
- Multi-level involvement
- No Instability
- MLD (17 patient's with 2-3 level stenosis),
- MED-UBF (17 patient's with 1 and 2 level stenosis)
- SPS-MM-multilevel (16 patient's with 2 level, 3 level and 4 level stenosis).
- Preop & Postop : Oswestry Disability Index & VAS
- Preop & Postop : CPK-MB & CRP
- Post-op MRI at 3 months to see multifidus changes
- Blood loss, operative time, hospital stay

Multi-level Micro-Lamino-Foraminotomy
- mid line incision
- Preservation of midline structures
- Bilateral micro decompression
- Widens canal without removing spinous process, interspinous ligaments and total lamina.

Surgical Technique
- Microendoscopic decompression- Unilateral approach bilateral foraminotomy (MED-UBF)
- Unilateral Approach with bilateral decompression.
- Preserves mid-line structures.
- Opposite side muscles preserved
- Paraspinal muscle splitting approach
- Serial dilators used to separate muscle fibers.

Microscope or endoscope used for visualization.

Lumbar Spinous Process Splitting Micro-Decompression (Modified Mermot's Procedure)
- Spinous process splitting approach.
- Para spinal muscles preserved.
- Multifidus muscle insertion on spinous process preserved.
- Surgical procedure remains same as standard surgery.

Table No. 1

Parameters	MICRO UBF	MLD 2-3 Level	SPINOUS PROCESS SPLITTING	Significance
No. of Patients	17	17	16	
Mean Age(Yr)	65.88+- 10.19	58.375+-13.46	66.56+-7.56	P>0.05
Male:Female	10:07	13:04	9:07	P>0.05
Mean of Bloodloss (mL)	59.4	87	93	P>0.05
Mean of Operation time (min)	88	131	136	P<0.05
Mean of Hospital stay (in Days)	6	6	9	P<0.05

Table No. 2

Difference of VAS	MICRO UBF	MLD 2-3 Level	SPINOUS PROCESS SPLITTING	Significance
Pre-op- VAS	8.41	8.59	8.31	P>0.05
Discharge - VAS	7.00	7.41	6.75	P>0.05
6 weeks -VAS	5.71	6.06	5.69	P>0.05
3 months - VAS	4.65	4.00	3.75	P>0.05
VAS after 6 Months	3.65	2.53	2.88	P>0.05

Table No.3

Difference in biochemical markers	MICRO UBF	MLD 2-3 Level	SPINOUS PROCESS SPLITTING	Significance
Pre op CPKMB	15+ - 23	16+-26	16+-28	P<0.05
Pre op CRP	4+-8	4+-6	7+-4	P<0.05
Post op CPKMB	12+-26	10+-30	9+-45	P>0.05
Post op CRP	25+-110	10+-134	4+-150	P>0.05

Table No.4

Difference in MRI Multifidus CSA(sq.cms)	Pre Op		Pre Op	
MED-UBF	5.29±0.55		5.27±0.55	
	Pre Op		Post Op	
	Right	Left	Right	Left
MLD 2-3 Level	5.05±0.65	5.03±0.65	5.03±0.63	4.44±0.73
SPINOUS PROCESS SPLITTING-MM	4.69±0.58	4.69±0.57	4.25±0.53	4.29±0.54

Table No.5

Difference in biochemical markers	MICRO UBF	MLD 2-3 Level	SPINOUS PROCESS SPLITTING	Significance
Pre op CPKMB	15+ - 23	16+-26	16+-28	P<0.05
Pre op CRP	4+-8	4+-6	7+-4	P<0.05
Post op CPKMB	12+-26	10+-30	9+-45	P>0.05
Post op CRP	25+-110	10+-134	4+-150	P>0.05

RESULTS
- VAS and ODI decreased indicating good clinical and functional recovery.
- No immediate post-op infection.
- Multifidus morphology well preserved in MED and SPS-MM, while minimal fatty-atrophic changes in MLD.
- Operative time was less.
- No Blood transfusion required.

Level of Decomp	L1-2, L2-3	L1-5	L2-3, L3-4, L4-5	L3-4, L4-5	L3-4, L4-5, L5-S1	L4-5	L4-5, L5-S1
MED-UBF				5		9	3
MLD 2-3 Level	1		2	8	1		5
SPINOUS PROCESS SPLITTING-MM		1	2	10	1		2
Total	1	1	4	23	2	9	10

CONCLUSION
- All 3 techniques achieve adequate neural decompression without compromising spinal stability.
- SPS-MM can be performed with routine instruments and loupes.

- Quick recovery
- Lesser hospitalization stay

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