

## Background:

Surgical site infection (SSI) usually occurs through direct inoculation of normal flora during surgery, leading to purulent drainage and/or wound dehiscence. Positive microbial culture of the ligamentum flavum (LF), paravertebral muscles, and nucleus pulposus (NP) but without symptoms is considered as surgical site contamination (SSC). Biportal endoscopic (BE) spine surgery is performed under continuous wound irrigation and is thus expected to have a lower incidence of SSI. This study aimed to evaluate SSC and SSI in patients undergoing BE and open microscopic (OM) transforaminal lumbar interbody fusion (TLIF).

## Methods:

This prospective cohort study included patients who underwent single-level TLIF. BE-TLIF was performed under continuous wound irrigation (90 mL/min) (group A, n=66), whereas OM-TLIF was performed under intermittent wound irrigation (1 L every 20 min) (group B, n=66). LF and NP samples were obtained, homogenized, gram-stained, and cultured in aerobic and anaerobic media for a maximum of 14 days. The culture results of the two groups were compared. Clinical outcomes and complication, including 90-day overt SSI, were investigated.

## Results:

A total of 132 patients were analyzed, of whom 34 (25.6%) had positive microbial cultures. The overall positive culture was significantly higher in group B than in group A ( $p=0.029$ ). The subgroups of positive LF and NP cultures were 18.18% ( $n=24$ ) and 12.88% ( $n=17$ ), respectively; the SSI was 0.76% ( $n=1$ ). The distribution of each subgroup was not different between the two groups ( $p>0.05$ ). However, group A showed a significantly lower subgroup of positive NP culture than group B ( $p=0.035$ ). The OM technique was an independent risk factor influencing positive culture ( $p=0.026$ ). The most common microorganism was *Cutibacterium acnes*. A 78-year-old man who underwent OM-TLIF was diagnosed with overt SSI by *C. acne*, which was the same as that in the positive culture strains of NP and LF, at 7 weeks after surgery.

## Conclusion:

Although the effects of the BE and OM techniques on SSI were not evaluated and the study has a low SSI rate and small sample size, BE-TLIF appears to have a significantly lower risk of SSC.

	Group A	Group B	Total	P-value
Overall positive culture	11 (16.67%)	23 (34.85%)	34 (25.6%)	0.029
Subgroup of LF Positive culture	8 (12.12%)	16 (24.24%)	24 (18.8%)	0.113
- NP positive	1 (1.5%)	6 (9.1%)	7 (5.3%)	0.16
- NP negative	7 (10.6%)	10 (15.2%)	17 (12.9%)	0.6
Subgroup of NP Positive culture	4 (6.06%)	13 (19.70%)	17 (12.88%)	0.035
- LF positive	1 (1.5%)	6 (9.1%)	7 (5.3%)	0.16
- LF negative	3 (4.5%)	7 (10.6%)	10 (7.6%)	0.32
Overall negative culture	55 (83.33%)	43 (65.15%)	98 (74.4%)	
Total	66	66	132	

Patients were classified into four subgroups, the positive culture of LF, the negative culture of LF, the positive culture of NP, and the negative culture of NP. Fisher exact test was done in each group