**Unilateral biportal endoscopy versus tubular microendoscopy in management of single level degenerative lumbar canal stenosis: A prospective study**

Collected Patient Data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **Table 1** | | | | | |
|  | Surgical Technique | N | Mean | Std. Deviation | Std. Error Mean |
| Gender | UBE | 77 | ,57 | ,498 | ,057 |
| TE | 77 | ,65 | ,480 | ,055 |
| Age | UBE | 77 | 64,64 | 10,090 | 1,150 |
| TE | 77 | 65,01 | 9,237 | 1,053 |
| Body Mass Index | UBE | 77 | 27,6903 | 4,49749 | ,51254 |
| TE | 77 | 27,6956 | 3,78507 | ,43135 |
| Diabetes Mellitus | UBE | 77 | ,22 | ,417 | ,048 |
| TE | 77 | ,17 | ,377 | ,043 |
| Hypertension | UBE | 77 | ,22 | ,417 | ,048 |
| TE | 77 | ,19 | ,399 | ,045 |
| Inflammatory Disease | UBE | 77 | ,08 | ,270 | ,031 |
| TE | 77 | ,09 | ,289 | ,033 |
| Smoker | UBE | 77 | ,39 | ,491 | ,056 |
| TE | 77 | ,31 | ,466 | ,053 |
| Duration | UBE | 77 | 57,7013 | 11,05853 | 1,26024 |
| TE | 77 | 65,3117 | 9,29100 | 1,05881 |
| Bleeding | UBE | 77 | 49,4678 | 9,12436 | ,98456 |
| TE | 77 | 53,5714 | 8,01385 | ,91326 |
| Hospitalization Time | UBE | 77 | 1,1182 | ,27755 | ,03163 |
| TE | 77 | 1,2896 | ,52103 | ,05938 |

Data Analysis

### Table 2

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Surgical Technique | Periods | ODI | | | | | | |
| N | Mean | Std. Deviation | Min | Max | Kolmogorov-Smirnov | |
| Statistic | P |
| UBE | Preop | 77 | 53,18 | 9,95 | 29 | 71 | 0,079 | 0,20\* |
| Immediate Postoperative | 77 | 19,68 | 4,10 | 10 | 31 | 0,131 | 0,00 |
| 1'st month | 77 | 14,99 | 3,81 | 6 | 25 | 0,151 | 0,00 |
| 3'rd month | 77 | 12,69 | 3,90 | 5 | 22 | 0,141 | 0,00 |
| 6'th month | 77 | 11,66 | 3,70 | 4 | 20 | 0,128 | 0,00 |
| 12'th month | 77 | 9,78 | 3,83 | 4 | 21 | 0,139 | 0,00 |
| 18'th month | 77 | 8,79 | 3,48 | 3 | 22 | 0,147 | 0,00 |
| 24'th month | 77 | 8,26 | 3,48 | 3 | 20 | 0,202 | 0,00 |
| TE | Preop | 77 | 51,39 | 10,89 | 32 | 80 | 0,103 | 0,04 |
| Immediate Postoperative | 77 | 25,29 | 3,40 | 17 | 38 | 0,157 | 0,00 |
| 1'st month | 77 | 16,61 | 3,83 | 10 | 26 | 0,135 | 0,00 |
| 3'rd month | 77 | 15,51 | 3,78 | 6 | 25 | 0,162 | 0,00 |
| 6'th month | 77 | 13,99 | 3,52 | 5 | 23 | 0,102 | 0,04 |
| 12'th month | 77 | 13,13 | 4,54 | 1 | 26 | 0,103 | 0,04 |
| 18'th month | 77 | 12,35 | 3,89 | 4 | 24 | 0,107 | 0,03 |
| 24'th month | 77 | 10,66 | 4,16 | 5 | 20 | 0,124 | 0,01 |
| TOTAL | Preop | 154 | 52,29 | 10,43 | 29 | 80 | 0,075 | 0,03 |
| Immediate Postoperative | 154 | 22,48 | 4,69 | 10 | 38 | 0,107 | 0,00 |
| 1'st month | 154 | 15,80 | 3,89 | 6 | 26 | 0,116 | 0,00 |
| 3'rd month | 154 | 14,10 | 4,08 | 5 | 25 | 0,113 | 0,00 |
| 6'th month | 154 | 12,82 | 3,79 | 4 | 23 | 0,094 | 0,00 |
| 12'th month | 154 | 11,45 | 4,51 | 1 | 26 | 0,095 | 0,00 |
| 18'th month | 154 | 10,57 | 4,09 | 3 | 24 | 0,110 | 0,00 |
| 24'th month | 154 | 9,46 | 4,01 | 3 | 20 | 0,120 | 0,00 |

According to the groups descriptive ODI values statistics. *\*p>0,05: Normal distributions*

### Table 3

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Surgical Technique | Periods | ZCQ | | | | | | |
| N | Mean | Std. Deviation | Min | Max | Kolmogorov-Smirnov | |
| Statistic | p |
| UBE | Preop | 77 | 68,82 | 9,34 | 49 | 94 | 0,112 | 0,02 |
| 1'st month | 77 | 34,78 | 6,78 | 22 | 55 | 0,143 | 0,00 |
| 3'rd month | 77 | 24,78 | 3,98 | 21 | 35 | 0,266 | 0,00 |
| 6'th month | 77 | 17,17 | 4,01 | 9 | 26 | 0,124 | 0,01 |
| 12'th mont | 77 | 16,00 | 4,27 | 5 | 26 | 0,097 | 0,07\* |
| 18'th month | 77 | 15,10 | 4,04 | 7 | 23 | 0,133 | 0,00 |
| 24'th month | 77 | 14,29 | 4,12 | 5 | 22 | 0,163 | 0,00 |
| TE | Preop | 77 | 69,92 | 9,99 | 44 | 88 | 0,095 | 0,08\* |
| 1'st month | 77 | 43,04 | 6,35 | 32 | 64 | 0,149 | 0,00 |
| 3'rd month | 77 | 32,55 | 5,66 | 21 | 48 | 0,124 | 0,01 |
| 6'th month | 77 | 23,96 | 4,10 | 14 | 36 | 0,140 | 0,00 |
| 12'th mont | 77 | 22,94 | 4,55 | 12 | 35 | 0,094 | 0,09\* |
| 18'th month | 77 | 23,00 | 5,07 | 12 | 37 | 0,163 | 0,00 |
| 24'th month | 77 | 22,73 | 4,66 | 15 | 34 | 0,172 | 0,00 |
| TOTAL | Preop | 154 | 69,37 | 9,65 | 44 | 94 | 0,100 | 0,00 |
| 1'st month | 154 | 38,91 | 7,75 | 22 | 64 | 0,110 | 0,00 |
| 3'rd month | 154 | 28,66 | 6,24 | 21 | 48 | 0,169 | 0,00 |
| 6'th month | 154 | 20,56 | 5,29 | 9 | 36 | 0,094 | 0,00 |
| 12'th month | 154 | 19,47 | 5,60 | 5 | 35 | 0,070 | 0,06\* |
| 18'th month | 154 | 19,05 | 6,05 | 7 | 37 | 0,099 | 0,00 |
| 24'th month | 154 | 18,51 | 6,10 | 5 | 34 | 0,088 | 0,01 |

According to the groups descriptive ZCQ values statistics. *\*p>0,05: Normal distributions*

### Table 4

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Surgical Technique | Periods | ODI | | | | | |
| N | Mean | Std. Deviation | Mean Rank | χ2 | p |
| UBE | Preop | 77 | 53,18 | 9,95 | 8,00 | 444,025 | 0,00\* |
| Immediate Postoperative | 77 | 19,68 | 4,10 | 6,86 |
| 1'st month | 77 | 14,99 | 3,81 | 5,52 |
| 3'rd month | 77 | 12,69 | 3,90 | 4,51 |
| 6'th month | 77 | 11,66 | 3,70 | 3,96 |
| 12'th month | 77 | 9,78 | 3,83 | 2,77 |
| 18'th month | 77 | 8,79 | 3,48 | 2,31 |
| 24'th month | 77 | 8,26 | 3,48 | 2,07 |
| TE | Preop | 77 | 51,39 | 10,89 | 8,00 | 421,523 | 0,00\* |
| Immediate Postoperative | 77 | 25,29 | 3,40 | 6,99 |
| 1'st month | 77 | 16,61 | 3,83 | 5,15 |
| 3'rd month | 77 | 15,51 | 3,78 | 4,56 |
| 6'th month | 77 | 13,99 | 3,52 | 3,66 |
| 12'th month | 77 | 13,13 | 4,54 | 3,11 |
| 18'th month | 77 | 12,35 | 3,89 | 2,69 |
| 24'th month | 77 | 10,66 | 4,16 | 1,84 |
| TOTAL | Preop | 154 | 52,29 | 10,43 | 8,00 | 861,549 | 0,00\* |
| Immediate Postoperative | 154 | 22,48 | 4,69 | 6,92 |
| 1'st month | 154 | 15,80 | 3,89 | 5,33 |
| 3'rd month | 154 | 14,10 | 4,08 | 4,54 |
| 6'th month | 154 | 12,82 | 3,79 | 3,81 |
| 12'th month | 154 | 11,45 | 4,51 | 2,94 |
| 18'th month | 154 | 10,57 | 4,09 | 2,50 |
| 24'th month | 154 | 9,46 | 4,01 | 1,96 |

Differences of the ODI in preoperative and postoperative periods. χ2: Friedman Test, \*p<0,10

### Table 5

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Surgical Technique | Peridos | ZCQ | | | | | |
| N | Mean | Std. Deviation | Mean Rank | χ2 | p |
| UBE | Preop | 77 | 68,82 | 9,34 | 7,00 | 423,327 | 0,00\* |
| 1'st month | 77 | 34,78 | 6,78 | 5,95 |
| 3'rd month | 77 | 24,78 | 3,98 | 5,00 |
| 6'th month | 77 | 17,17 | 4,01 | 3,34 |
| 12'th mont | 77 | 16,00 | 4,27 | 2,72 |
| 18'th month | 77 | 15,10 | 4,04 | 2,25 |
| 24'th month | 77 | 14,29 | 4,12 | 1,73 |
| TE | Preop | 77 | 69,92 | 9,99 | 6,99 | 382,905 | 0,00\* |
| 1'st month | 77 | 43,04 | 6,35 | 5,92 |
| 3'rd month | 77 | 32,55 | 5,66 | 4,86 |
| 6'th month | 77 | 23,96 | 4,10 | 3,06 |
| 12'th mont | 77 | 22,94 | 4,55 | 2,56 |
| 18'th month | 77 | 23,00 | 5,07 | 2,35 |
| 24'th month | 77 | 22,73 | 4,66 | 2,26 |
| TOTAL | Preop | 154 | 69,37 | 9,65 | 7,00 | 802,319 | 0,00\* |
| 1'st month | 154 | 38,91 | 7,75 | 5,94 |
| 3'rd month | 154 | 28,66 | 6,24 | 4,93 |
| 6'th month | 154 | 20,56 | 5,29 | 3,20 |
| 12'th mont | 154 | 19,47 | 5,60 | 2,64 |
| 18'th month | 154 | 19,05 | 6,05 | 2,30 |
| 24'th month | 154 | 18,51 | 6,10 | 1,99 |

Differences of the ZCQ in preoperative and postoperative periods χ2: Friedman Test, \*p<0,10

### Table 6

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Periods | | ODI | | | | | |
| UBE (N=77) | | TE (N=77) | | TOTAL (N=154) | |
| Z | p | Z | P | Z | p |
| Preop | Immediate Postoperative | -7,625 | 0,000\* | -7,626 | 0,000\* | -10,766 | 0,000\* |
| 1'st month | -7,626 | 0,000\* | -7,625 | 0,000\* | -10,766 | 0,000\* |
| 3'rd month | -7,626 | 0,000\* | -7,625 | 0,000\* | -10,766 | 0,000\* |
| 6'th month | -7,626 | 0,000\* | -7,625 | 0,000\* | -10,766 | 0,000\* |
| 12'th month | -7,626 | 0,000\* | -7,625 | 0,000\* | -10,766 | 0,000\* |
| 18'th month | -7,625 | 0,000\* | -7,626 | 0,000\* | -10,766 | 0,000\* |
| 24'th month | -7,625 | 0,000\* | -7,625 | 0,000\* | -10,766 | 0,000\* |
| Immediate Postoperative | Preop | - | - | - | - | - | - |
| 1'st month | -7,015 | 0,000\* | -7,597 | 0,000\* | -10,407 | 0,000\* |
| 3'rd month | -7,385 | 0,000\* | -7,631 | 0,000\* | -10,615 | 0,000\* |
| 6'th month | -7,622 | 0,000\* | -7,630 | 0,000\* | -10,769 | 0,000\* |
| 12'th month | -7,632 | 0,000\* | -7,629 | 0,000\* | -10,772 | 0,000\* |
| 18'th month | -7,630 | 0,000\* | -7,630 | 0,000\* | -10,773 | 0,000\* |
| 24'th month | -7,631 | 0,000\* | -7,629 | 0,000\* | -10,771 | 0,000\* |
| 1'st month | Preop | - | - | - | - | - | - |
| Immediate Postoperative | - | - | - | - | - | - |
| 3'rd month | -5,867 | 0,000\* | -3,627 | 0,000\* | -6,840 | 0,000\* |
| 6'th month | -6,116 | 0,000\* | -5,946 | 0,000\* | -8,539 | 0,000\* |
| 12'th month | -7,114 | 0,000\* | -6,309 | 0,000\* | -9,585 | 0,000\* |
| 18'th month | -7,410 | 0,000\* | -6,849 | 0,000\* | -10,187 | 0,000\* |
| 24'th month | -7,290 | 0,000\* | -7,279 | 0,000\* | -10,282 | 0,000\* |
| 3'rd month | Preop | - | - | - | - | - | - |
| Immediate Postoperative | - | - | - | - | - | - |
| 1'st month | - | - | - | - | - | - |
| 6'th month | -3,095 | 0,002\* | -4,314 | 0,000\* | -5,224 | 0,000\* |
| 12'th month | -6,240 | 0,000\* | -5,220 | 0,000\* | -8,105 | 0,000\* |
| 18'th month | -6,792 | 0,000\* | -6,206 | 0,000\* | -9,234 | 0,000\* |
| 24'th month | -6,449 | 0,000\* | -7,032 | 0,000\* | -9,529 | 0,000\* |
| 6'th month | Preop | - | - | - | - | - | - |
| Immediate Postoperative | - | - | - | - | - | - |
| 1'st month | - | - | - | - | - | - |
| 3'rd month | - | - | - | - | - | - |
| 12'th month | -5,584 | 0,000\* | -2,573 | 0,010\* | -5,828 | 0,000\* |
| 18'th month | -6,621 | 0,000\* | -4,278 | 0,000\* | -7,876 | 0,000\* |
| 24'th month | -6,150 | 0,000\* | -6,260 | 0,000\* | -8,785 | 0,000\* |
| 12'th month | Preop | - | - | - | - | - | - |
| Immediate Postoperative | - | - | - | - | - | - |
| 1'st month | - | - | - | - | - | - |
| 3'rd month | - | - | - | - | - | - |
| 6'th month | - | - | - | - | - | - |
| 18'th month | -3,600 | 0,000\* | -2,248 | 0,025 | -4,096 | 0,000\* |
| 24'th month | -3,565 | 0,000\* | -5,112 | 0,000\* | -6,186 | 0,000\* |
| 18'th month | Preop | - | - | - | - | - | - |
| Immediate Postoperative | - | - | - | - | - | - |
| 1'st month | - | - | - | - | - | - |
| 3'rd month | - | - | - | - | - | - |
| 6'th month | - | - | - | - | - | - |
| 12'th month | - | - | - | - | - | - |
| 24'th month | -1,444 | 0,149 | -4,248 | 0,000\* | -4,178 | 0,000\* |
| 24'th month | Preop | - | - | - | - | - | - |
| Immediate Postoperative | - | - | - | - | - | - |
| 1'st month | - | - | - | - | - | - |
| 3'rd month | - | - | - | - | - | - |
| 6'th month | - | - | - | - | - | - |
| 12'th month | - | - | - | - | - | - |
| 18'th month | - | - | - | - | - | - |

Pre and postoperative ODI binary comparison. Z: Wilcoxon Paired Test, \*p<0,013

Table 7.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Periods | | ZCQ | | | | | |
| UBE (N=77) | | TE (N=77) | | TOTAL (N=154) | |
| Z | p | Z/T\*\* | P | Z | p |
| Preop | 1'st month | -7,626 | 0,000\* | -7,576 | 0,000\* | -10,731 | 0,000\* |
| 3'rd month | -7,626 | 0,000\* | -7,625 | 0,000\* | -10,766 | 0,000\* |
| 6'th month | -7,626 | 0,000\* | -7,625 | 0,000\* | -10,766 | 0,000\* |
| 12'th month | -7,627 | 0,000\* | 37,674\*\* | 0,000\* | -10,767 | 0,000\* |
| 18'th month | -7,627 | 0,000\* | -7,626 | 0,000\* | -10,767 | 0,000\* |
| 24'th month | -7,626 | 0,000\* | -7,625 | 0,000\* | -10,766 | 0,000\* |
| 1'st month | Preop | - | - | - | - | - | - |
| 3'rd month | -7,479 | 0,000\* | -7,311 | 0,000\* | -10,435 | 0,000\* |
| 6'th month | -7,627 | 0,000\* | -7,627 | 0,000\* | -10,767 | 0,000\* |
| 12'th month | -7,626 | 0,000\* | -7,627 | 0,000\* | -10,768 | 0,000\* |
| 18'th month | -7,627 | 0,000\* | -7,626 | 0,000\* | -10,767 | 0,000\* |
| 24'th month | -7,627 | 0,000\* | -7,622 | 0,000\* | -10,766 | 0,000\* |
| 3'rd month | Preop | - | - | - | - | - | - |
| 1'st month | - | - | - | - | - | - |
| 6'th month | -7,480 | 0,000\* | -7,500 | 0,000\* | -10,575 | 0,000\* |
| 12'th month | -7,579 | 0,000\* | -7,494 | 0,000\* | -10,647 | 0,000\* |
| 18'th month | -7,531 | 0,000\* | -7,250 | 0,000\* | -10,455 | 0,000\* |
| 24'th month | -7,580 | 0,000\* | -7,378 | 0,000\* | -10,590 | 0,000\* |
| 6'th month | Preop | - | - | - | - | - | - |
| 1'st month | - | - | - | - | - | - |
| 3'rd month | - | - | - | - | - | - |
| 12'th month | -4,785 | 0,000\* | -3,452 | 0,001\* | -5,761 | 0,000\* |
| 18'th month | -5,754 | 0,000\* | -3,124 | 0,002\* | -6,184 | 0,000\* |
| 24'th month | -6,615 | 0,000\* | -4,043 | 0,000\* | -7,547 | 0,000\* |
| 12'th month | Preop | - | - | - | - | - | - |
| 1'st month | - | - | - | - | - | - |
| 3'rd month | - | - | - | - | - | - |
| 6'th month | - | - | - | - | - | - |
| 18'th month | -3,994 | 0,000\* | -0,822 | 0,411 | -3,243 | 0,001\* |
| 24'th month | -5,290 | 0,000\* | -1,348 | 0,178 | -4,737 | 0,000\* |
| 18'th month | Preop | - | - | - | - | - | - |
| 1'st month | - | - | - | - | - | - |
| 3'rd month | - | - | - | - | - | - |
| 6'th month | - | - | - | - | - | - |
| 12'th month | - | - | - | - | - | - |
| 24'th month | -3,877 | 0,000\* | -0,859 | 0,390 | -3,349 | 0,001\* |
| 24'th month | Preop | - | - | - | - | - | - |
| 1'st month | - | - | - | - | - | - |
| 3'rd month | - | - | - | - | - | - |
| 6'th month | - | - | - | - | - | - |
| 12'th month | - | - | - | - | - | - |
| 18'th month | - | - | - | - | - | - |

Pre and postoperative ZCQ binary comparison. Z: Wilcoxon signed-rank Test, T: Two dependent sample T Test, \*p<0,014

### Table 8

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Periods | Surgical Technique | ODI | | | | | | |
| N | Mean | Std. Deviation | F | p1 | Z | p2 |
| Preop | UBE | 77 | 53,18 | 9,95 | 8,443 | 0,00\* | -1,255 | 0,209 |
| TE | 77 | 51,39 | 10,89 |
| Immediate Postoperative | UBE | 77 | 19,68 | 4,10 | -7,678 | 0,000\* |
| TE | 77 | 25,29 | 3,40 |
| 1'st month | UBE | 77 | 14,99 | 3,81 | -2,172 | 0,030 |
| TE | 77 | 16,61 | 3,83 |
| 3'rd month | UBE | 77 | 12,69 | 3,90 | -4,397 | 0,000\* |
| TE | 77 | 15,51 | 3,78 |
| 6'th month | UBE | 77 | 11,66 | 3,70 | -3,568 | 0,000\* |
| TE | 77 | 13,99 | 3,52 |
| 12'th month | UBE | 77 | 9,78 | 3,83 | -4,892 | 0,000\* |
| TE | 77 | 13,13 | 4,54 |
| 18'th month | UBE | 77 | 8,79 | 3,48 | -5,612 | 0,000\* |
| TE | 77 | 12,35 | 3,89 |
| 24'th month | UBE | 77 | 8,26 | 3,48 | -3,723 | 0,000\* |
| TE | 77 | 10,66 | 4,16 |

According to the groups differences of the ODI values in preop and postoperative periods

F: Two-way repeated measures ANOVA, \*p1<0,10, Z: Mann Whitney U Test, \* p2<0,012

### Table 9

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Periods | Surgical Technique | ZCQ | | | | | | |
| N | Mean | Std. Deviation | F | p1 | Test Statistics | p2 |
| Preop | UBE | 77 | 68,82 | 9,34 | 4,833 | 0,00\* | Z= -1,092 | 0,275 |
| TE | 77 | 69,92 | 9,99 |
| 1'st month | UBE | 77 | 34,78 | 6,78 | Z= 6,880 | 0,000\* |
| TE | 77 | 43,04 | 6,35 |
| 3'rd month | UBE | 77 | 24,78 | 3,98 | Z= -7,691 | 0,000\* |
| TE | 77 | 32,55 | 5,66 |
| 6'th month | UBE | 77 | 17,17 | 4,01 | Z= -8,432 | 0,000\* |
| TE | 77 | 23,96 | 4,10 |
| 12'th mont | UBE | 77 | 16,00 | 4,27 | T= -9,760 | 0,000\* |
| TE | 77 | 22,94 | 4,55 |
| 18'th month | UBE | 77 | 15,10 | 4,04 | Z= -8,503 | 0,000\* |
| TE | 77 | 23,00 | 5,07 |
| 24'th month | UBE | 77 | 14,29 | 4,12 | Z= -9,062 | 0,000\* |
| TE | 77 | 22,73 | 4,66 |

According to the groups differences of the ZCQ values in preop and postoperative periods.

F: Two-way repeated measures ANOVA, \*p1<0,10, Z: Mann Whitney U Test, T: Independent sample T Test, \*p2<0,014

Figure 1

Figure 2