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| Supplementary Table 1 Comparison of complications, revision surgery rate and cost effectiveness due to the different lower instrumented vertebrae |
|  | S1 group (n=11) | Iliac group (n=162) | P value |
| Age (years) | 68.5 ± 4.8 | 69.1 ± 7.4 | 0.797 |
| No. of fused vertebrae | 8.8 ± 1.1 | 10.2 ± 1.8 | **0.016** |
| No. of pedicle screws | 17.5 ± 2.1 | 21.1 ± 3.3 | **0.001** |
| Screw density | 2.0 ± 0.0 | 2.1 ± 0.3 | **0.002** |
| Overall perioperative complication N (%) | 0 (0) | 55 (34) | **0.018** |
| Surgical complication | 0 (0) | 13 (8) | 1.000 |
| Neurological complication | 0 (0) | 15 (9) | 0.602 |
| Medical complication | 0 (0) | 36 (22) | 0.123 |
| Revision surgery N (%) | 3 (27) | 26 (16) | 0.335 |
| Medical expenses for initial surgery (USD) | 57,513 ± 6,367 | 73,084 ± 11,129 | **< 0.001** |
| 2-year total medical expenses (USD) | 64,490 ± 10,600 | 77,095 ± 16,737 | **0.015** |
| Modelled SF-6D scores at baseline | 0.54 ± 0.10 | 0.56 ± 0.08 | 0.498 |
| Modelled SF-6D scores at 2-year Post OP | 0.57 ± 0.05 | 0.64 ± 0.09 | **0.016** |
| 2-year QALY improvements | 0.06 ± 0.17 | 0.16 ± 0.19 | 0.074 |
| Cost per QALY (USD)  | 1,141,234 | 476,876 | NA |
| A comparison was done between the group with only S1 screw as the lower instrumented vertebrae (LIV) (S1 group) and the group with S1 screw and iliac screw as LIV (Iliac group) Mean values are presented as mean ± SD. Bold type indicates statistical significance. P < 0.05 was considered as significant. NA, not applicable; QALY, quality adjusted life years |

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| Supplementary Table 2 Comparison of complications, revision surgery rate and cost effectiveness of different surgical procedures for degenerative kyphoscoliosis (n=94) |
|  | Grade 2 osteotomy (n=38) | 3-column osteotomy (n=5) | LLIF (n=51) | P value † | G2 vs. 3-c P value ‡ | G2 vs. LLIF P value § | 3-c vs. LLIF P value ¶ |
| Age (years) | 69.5 ± 6.4 | 69.0 ± 6.4 | 70.5 ± 6.6 | 0.714 | NS | NS | NS |
| Baseline |
| Thoracic kyphosis (°) | 22.3 ± 17.0 | 8.0 ± 24.8 | 25.8 ± 15.4 | 0.066 | NS | NS | NS |
| Lumbar lordosis (°) | 11.5 ± 14.7 | -22.4 ± 21.6 | 13.6 ± 15.3 | **< 0.001** | **< 0.001** | 0.791 | **< 0.001** |
| Pelvic tilt (°) | 35.0 ± 10.5 | 41.8 ± 12.0 | 35.2 ± 9.4 | 0.350 | NS | NS | NS |
| Pelvic incidence minus lumbar lordosis (°) | 38.7 ± 21.1 | 75.0 ± 19.9 | 36.4 ± 17.9 | **< 0.001** | **< 0.001** | 0.811 | **< 0.001** |
| Sagittal vertical axis (mm) | 102.6 ± 66.9 | 211.0 ± 65.7 | 102.7 ± 60.0 | **0.002** | **0.001** | 1.000 | **0.001** |
| Cobb angle (°) | 36.2 ± 18.1 | 26.8 ± 14.2 | 38.0 ± 15.8 | 0.360 | NS | NS | NS |
| No. of fused vertebrae | 9.2 ± 0.9 | 10.0 ± 1.0 | 10.0 ± 1.7 | **0.040** | 0.474 | **0.035** | 1.000 |
| No. of pedicle screws | 19.7 ± 2.1 | 19.6 ± 2.2 | 21.8 ± 3.3 | **0.002** | 0.998 | **0.002** | 0.222 |
| Screw density | 2.1 ± 0.4 | 2.0 ± 0.1 | 2.2 ± 0.1 | **0.041** | 0.270 | 0.205 | **0.010** |
| Overall complication N (%) | 10 (26) | 2 (34) | 19 (34) | 0.523 |  |  |  |
| Surgical complication | 3 (8) | 0 (0) | 3 (6) | 0.776 |  |  |  |
| Neurological complication | 3 (8) | 0 (0) | 8 (16) | 0.372 |  |  |  |
| Medical complication | 7 (19) | 2 (40) | 10 (20) | 0.522 |  |  |  |
| Revision surgery N (%) | 7 (18) | 2 (40) | 3 (6) | **0.037** |  |  |  |
| Medical expenses for initial surgery (USD) | 63,889 ± 11,750 | 70,756 ± 5,745 | 80,870 ± 6,544 | **<0.001** | 0.250 | **<0.001** | **0.048** |
| 2-year total medical expenses (USD) | 65,971 ± 11,868 | 84,857 ± 16,737 | 83,040 ± 9,999 | **<0.001** | 0.259 | **<0.001** | 0.982 |
| Modelled SF-6D scores at baseline | 0.54 ± 0.08 | 0.58 ± 0.08 | 0.57 ± 0.07 | 0.199 | NS | NS | NS |
| Modelled SF-6D scores at 2-year Post OP | 0.60 ± 0.08 | 0.65 ± 0.09 | 0.66 ± 0.09 | **0.005** | 0.472 | **0.004** | 0.944 |
| 2-year QALY improvements | 0.13 ± 0.19 | 0.14 ± 0.21 | 0.19 ± 0.18 | 0.294 | NS | NS | NS |
| Cost per QALY (USD)  | 524,899 | 611,253 | 442,888 | NA | NA | NA | NA |
| Mean values are presented as mean ± SD. Bold type indicates statistical significance. †Comparison between groups. ‡Post hoc comparison between Grade 2 osteotomy and 3-column osteotomy.§Post hoc comparison between Grade 2 osteotomy and LLIF. ¶Post hoc comparison between 3-column osteotomy and LLIF. P < 0.05 was considered as significant. G2, grade 2 osteotomy; LLIF, lateral lumbar interbody fusion; NA, not applicable; NS, not significant; QALY, quality adjusted life years; 3-c, 3-cloumn osteotomy |

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