Introduction The GAP-score helps planning the ideal sagittal realignment. It comprises 3 lumbopelvic domains that can be surgically modified (lumbar lordosis-RLL, lumbar distribution-LDI, pelvic version-RPV) and one domain indirectly restored (sagittal alignment-RSA). We intended to analyze which domain was the hardest to realign and its implications. Materials and methods From an ASD multicenter prospective database we selected patients: fused to pelvis, UIV at or above L1, and 2-yr follow-up. We graded according to GAP severity scale (0-1-2-3) the immediate postoperative (6-weeks) domains: RPV-6w, RLL-6w, LDI-6w, and RSA-6w. We analyzed which one had the highest rate of severe disproportions (grade 3), and their impact on 2-years mechanical complications and PROMs. We further stratified patients based on PI, baseline RSA, and the use of 3COs. Univariate analysis was used ($\chi 2$, Student-t, Mann-Whitney U, Spearman Rho, Logistic Regression). Results We included 333 patients, median age 66 years (IQ1 59; IQ3 72), mostly female (81.4%). The rate of grade 3 disproportions was: RPV-6w 11.4% (severe retroversion), LDI-6w 6% (severe upper lumbar arc hyperlordosis), RLL-6w 2.1% (lumbar hyperlordosis), and RSA-6w 21.9% (severe positive malalignment). RPV-6w grade 3 was associated with the presence ($\chi 2$ p=0.042) and correlated with the number (Spearman Rho=-0.119; p=0.029) of mechanical complications, mostly related with implant prominence ($\chi 2$ p=0.043). It was also associated with postoperative sagittal malalignment ($\chi 2$ p=0.049). RLL-6w grade 3 was associated with PJK/PJF ($\chi 2$ p=0.014) and hook dislodgement ($\chi 2$ p=0.038). Stratification only showed that 3COs (PSO and VCR) were related with LDI-6w grade 3 ($\chi 2$ p=0.036). Only postoperative severe positive malalignment (RSA-6w≥18º) associated fewer improvements on PROMs: ΔODI (17.2 vs 8.83; p<0.05), ΔSRS-22 Total (0.87 vs 0.54; p<0.05), and ΔSF-36PCS (7.76 vs 3.47; p<0.05). Conclusion We should direct our efforts to improve the restoration of ideal pelvic version in ASD surgery, as it has shown to be the most underperformed modifiable parameter when it comes to sagittal realignment. Severe retroversion was associated with postoperative mechanical complications and sagittal malalignment; and postoperative severe malalignment strongly affected PROMs improvement.

Table 1. Comparison of the immediate postoperative (6-weeks) realignment achieved in the four GAP domains

	Grade 0	Grade 1	Grade 2	Grade 3
RPV Scale	Aligned	Anteversion	Moderate retroversion	Severe retroversion
RPV-6w	45.6%	2.7%	40.2%	11.4%
RLL Scale	Aligned	Moderate hypolordosis	Severe hypolordosis	Hyperlordosis
RLL-6w	58.3%	25.2%	14.4%	2.1%
LDI Scale	Aligned	LLA hyperlordosis	Moderate ULA hyperlordosis	Severe ULA hyperlordosis
LDI-6w	55.3%	30%	8.7%	6%
RSA Scale	Aligned	Negative malalignment	Moderate positive malalignment	Severe positive malalignemnt
RSA-6w	43,5%	34,5%		21,9%

LLA=Lower Lumbar Arc; ULA=Upper Lumbar Arc