

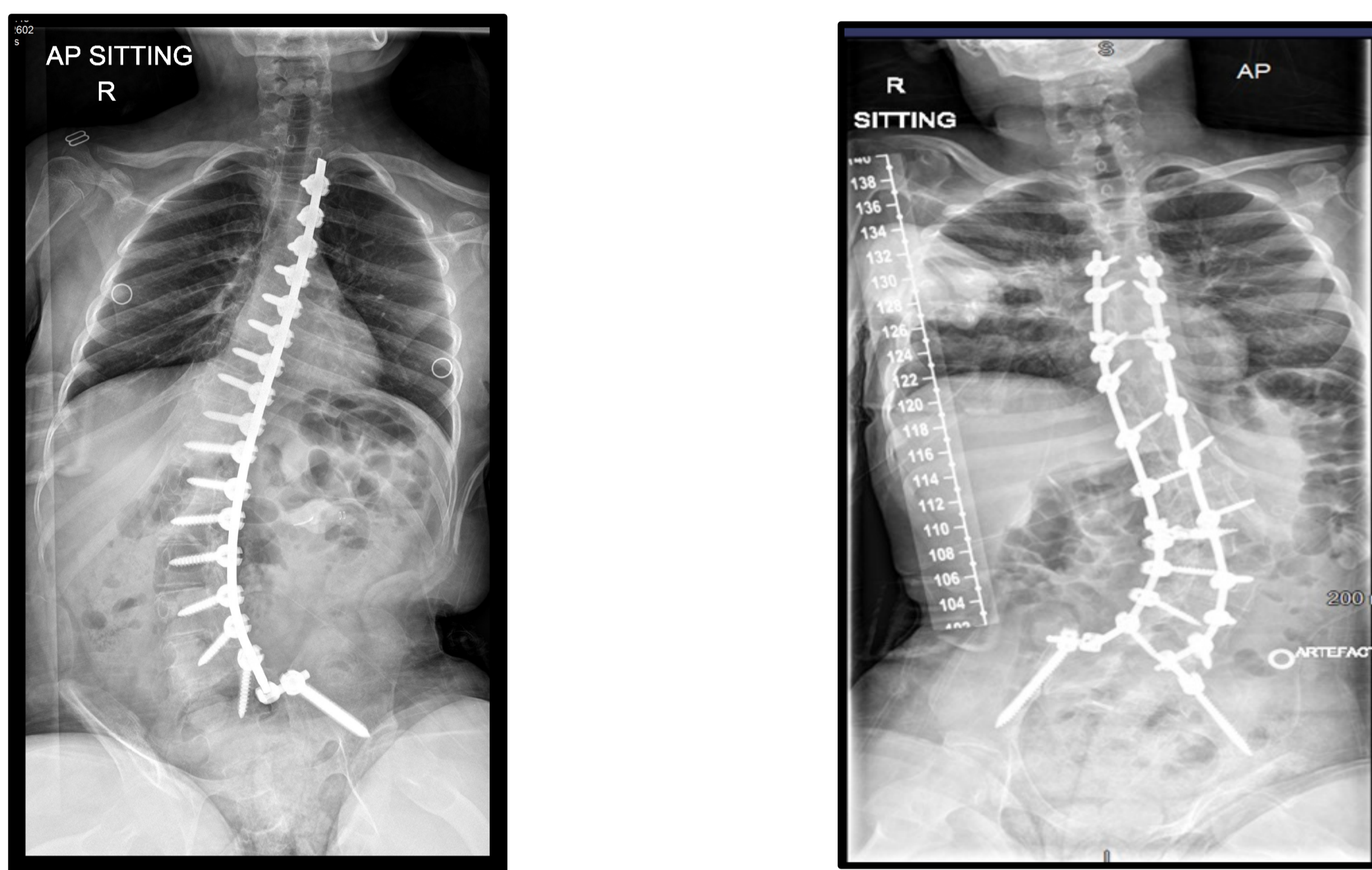
Background

- Dual rod segmental spinal instrumentation is the gold standard surgical procedure for the management of NMS
- Less invasive single-rod fusion technique may be indicated to minimise common clinical issues:
 - operative time
 - blood loss
 - wound-related complications/ infection
- A Single-Rod Technique has been demonstrated In AIS

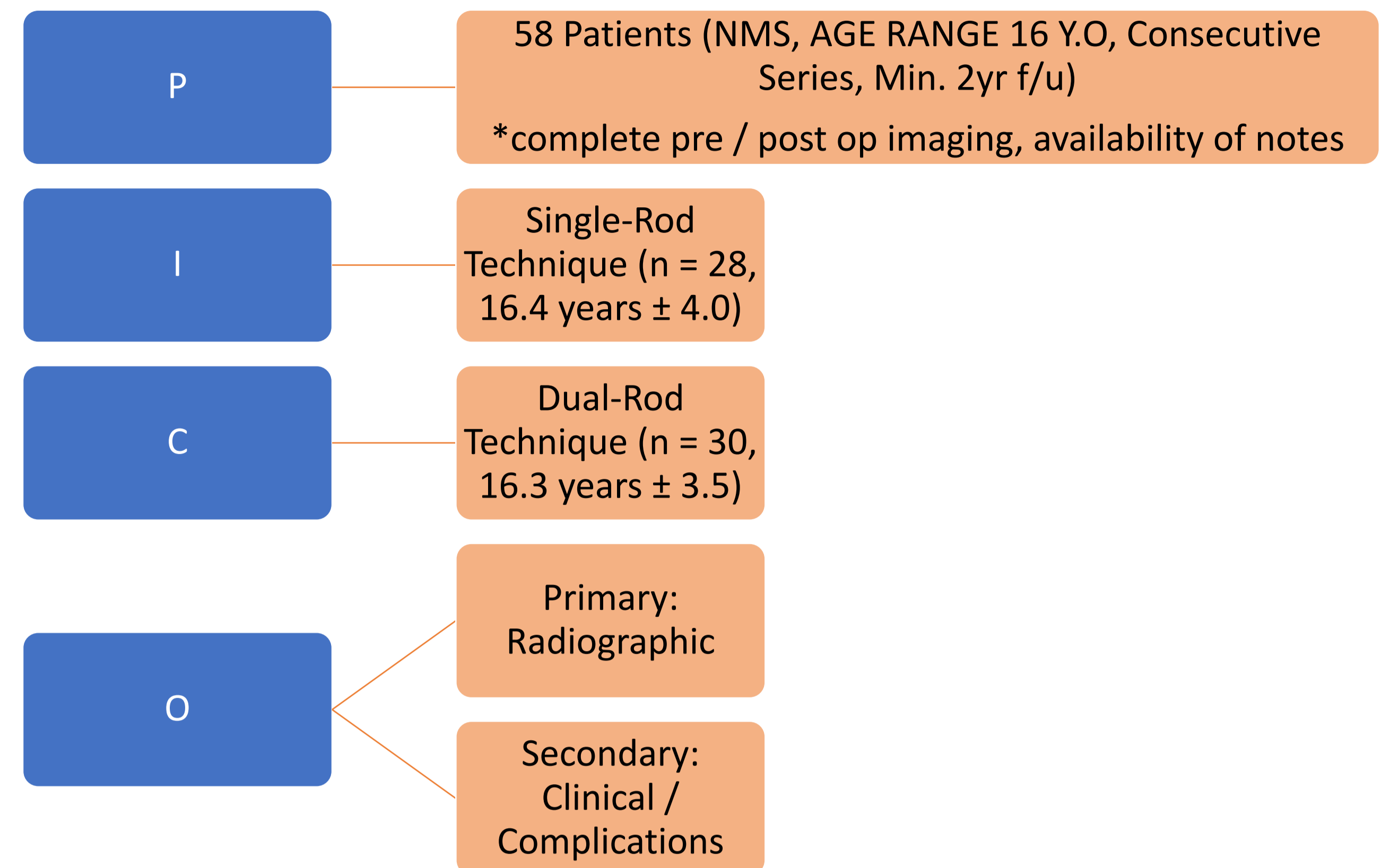
Statistical methods

- Analyses performed for each outcome included:
 - unadjusted comparison between groups (analysis 1)
 - adjusted for baseline demographic factors and comorbidities (analysis 2)
 - analysis 2 + additional adjustments for surgical factors
- All outcome analysis was performed using a regression approach.

Single rod vs double rod technique



Patients & Methods



Results

- There was no statistically significant difference in any of the outcomes between the two groups (at follow up) both with and without adjustments for factors found to vary between groups (Table 1)
- This is also true for the angles at initial post-operative review
- There was no statistically significant differences in outcomes between groups for (Tables 2&3)
 - length of surgery
 - blood loss
 - length of stay
 - complication outcomes (general and implant failure)
 - Changes in outcomes from immediate post-op to final follow-up

Outcome	Adjustments	Single		Double		Difference (*)	P-value
		n	Median [IQR]	n	Median [IQR]		
Lumber – F/U	None	5	20 [10, 22]	5	28 [20, 28]	1.64 (0.46, 5.91)	0.40
	Baseline (#)	-	-	-	-	1.14 (0.26, 5.07)	0.84
	Baseline (#) + Surgical (&)	-	-	-	-	2.60 (0.37, 18.4)	0.25
Thoracic – F/U	None	3	12 [6, 18]	10	29 [20, 34]	2.01 (0.55, 7.31)	0.26
	Baseline (##)	-	-	-	-	1.26 (0.32, 5.04)	0.71
	Baseline (##) + Surgical (&)	-	-	-	-	1.08 (0.19, 6.28)	0.92
Thoracolumbar – F/U	None	23	19 [10, 34]	19	28 [10, 36]	1.13 (0.66, 1.91)	0.65
	Baseline (###)	-	-	-	-	1.10 (0.61, 1.99)	0.75
	Baseline (###) + Surgical (&)	-	-	-	-	1.35 (0.60, 3.06)	0.46
Kyphosis – F/U	None	27	27 [17, 36]	28	25 [18, 32]	0.94 (0.71, 1.23)	0.63
	Baseline (###)	-	-	-	-	0.91 (0.67, 1.23)	0.53
	Baseline (###) + Surgical (&)	-	-	-	-	0.97 (0.66, 1.42)	0.86
Obliquity – F/U	None	27	4.2 [2.2, 6.0]	28	1.5 [1.0, 4.3]	0.47 (0.28, 0.82)	0.008
	Baseline (####)	-	-	-	-	0.61 (0.34, 1.09)	0.09
	Baseline (####) + Surgical (&)	-	-	-	-	0.69 (0.34, 1.38)	0.28

Table 1 - COBB angles at final follow-up

Outcome	Adjustments	Single		Double		Difference (**)	P-value
		n	Mean ± SD	n	Mean ± SD		
Length of surgery	None	28	197 ± 46	30	197 ± 53	0 (-26, 26)	0.99
	Baseline (###)	-	-	-	-	3 (-27, 33)	0.84
	Baseline (###) + Surgical (&)	-	-	-	-	25 (-11, 60)	0.17
Blood loss	None	28	675 [450, 1000]	30	475 [340, 1200]	0.84 (0.59, 1.20)	0.33
	Baseline (###)	-	-	-	-	0.73 (0.49, 1.09)	0.12
	Baseline (###) + Surgical (&)	-	-	-	-	0.81 (0.49, 1.33)	0.39
Length of stay	None	28	17 [12, 18]	30	12 [10, 16]	0.94 (0.73, 1.22)	0.64
	Baseline (###)	-	-	-	-	0.98 (0.74, 1.30)	0.90
	Baseline (###) + Surgical (&)	-	-	-	-	1.02 (0.72, 1.44)	0.92

Table 2 – Outcomes of single vs double rod group

Outcome	Adjustments	Single		Double		Difference (*)	P-value
		n	n (%)	n	n (%)		
Complication (+)	None	28	6 (21%)	30	4 (13%)	0.56 (0.14, 2.26)	0.42
	Baseline (#)	-	-	-	-	0.54 (0.12, 2.41)	0.42
	Baseline (#) + Surgical (&)	-	-	-	-	0.78 (0.12, 4.97)	0.79
Implant failure	None	28	4 (14%)	30	3 (10%)	0.67 (0.14, 3.28)	0.62
	Baseline (#)	-	-	-	-	0.70 (0.14, 3.48)	0.66
	Baseline (#) + Surgical (&)	-	-	-	-	1.29 (0.16, 10.6)	0.81
Revision surgery	-	28	2 (7%)	30	2 (7%)	(^)	

Table 3 – Complication outcomes of single vs double rod group

Conclusion

- Both single and double rod instrumentation achieves satisfactory deformity correction which is maintained at final follow up
- A larger scale study is warranted to further assess these techniques
- A cost-benefit analysis between the two constructs will be an important consideration at a time where health economics play a vital role in provision of patient care.