

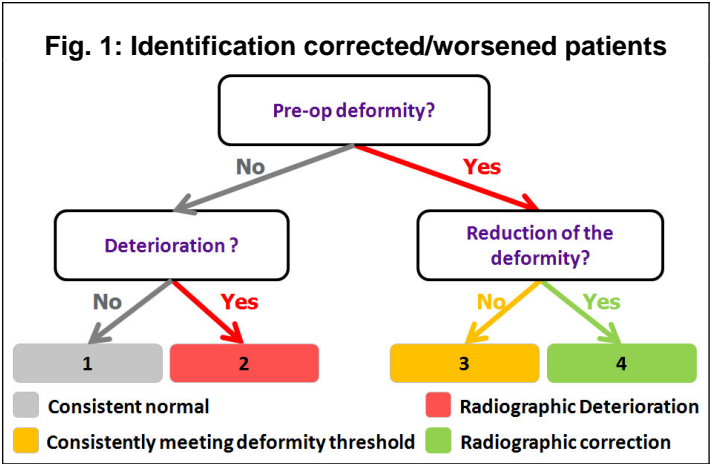
Radiographic Outcomes of Spinal Deformity Correction in Adult Patients: A Critical Analysis of Variability and Failures Across Deformity Patterns

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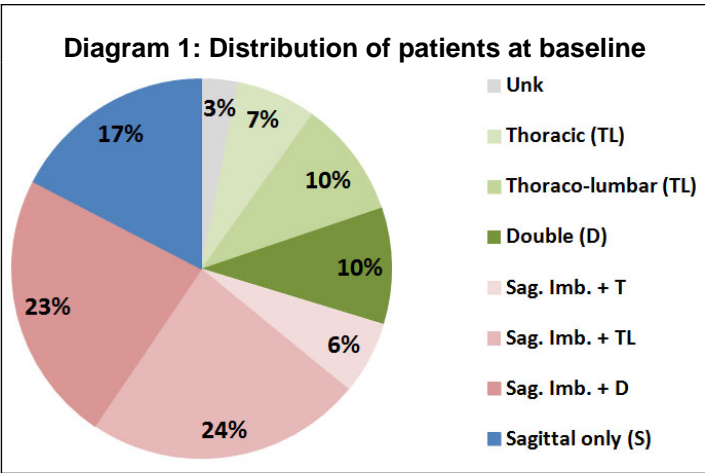
**Introduction:** Pain and disability in adult spinal deformity (ASD) correlate with radiographic parameters. A main goal of surgery for ASD is to restore a harmonious spino-pelvic (SP) alignment. This study aims to evaluate the effectiveness of surgical treatment in restoring SP alignment.

**Methods:** Prospective analysis of consecutive ASD patients. Inclusion criteria: operative patients, age>18, baseline (BL) and 1-year full-length X-rays. T and TL curves, Cobb angle, Coronal Imbalance (CI), SVA, Pelvic Incidence minus Lumbar Lordosis (PI-LL) and Pelvic Tilt (PT) were calculated. Each parameter, at BL and 1yr, was categorized as pathologic or normal. Pathologic limits: Cobb>30°, CI>40mm, SVA>40mm, PI-LL>10° and PT>20° (Fig. 1). Distinction between curves (Coronal [T, TL, D], Sagittal [T, TL, D] and S) was also analyzed.



**Results:** 161 patients (age=55±15) were included. At BL, 80% of patients had Cobb angle>30°, 25% had a CI, 46% had a SVA,

42% had a PI-LL, and 58% had a PT.



The Cobb angle is a parameter most consistently corrected and also the least deteriorated (diagram 2). Postoperatively, 26% of patients had a Cobb angle >30°.

Better correction noted for patients with Cobb angle and sagittal imbalance (Sag. Imb.) (table 1). Patients with CI corrected less than those with Cobb angle. Patients with TL + Sag. Imb. were more corrected in terms of PI-LL (table 2). PT curve were more deteriorated and less

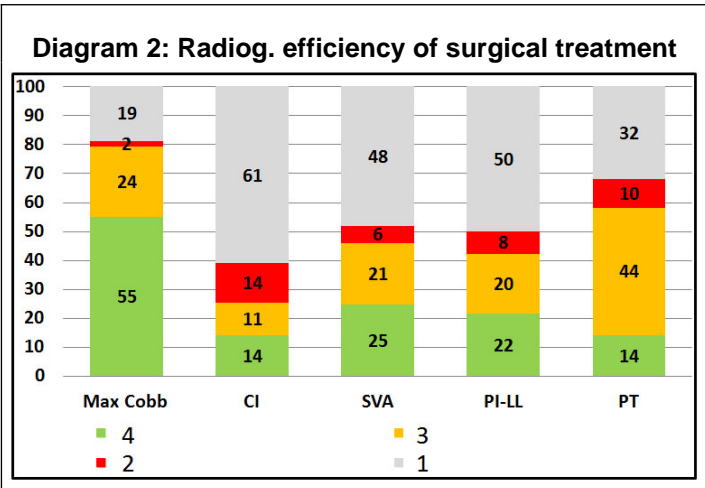


Table 1: Correction in coronal plane

	%	Unk	No Sag. Imb.			Sag. Imb.			S
			T	TL	D	T	TL	D	
Cobb	1	80							93
	2	20							7
	3		18	6	31	30	32	43	
	4		82	94	69	70	68	57	
Coro. Imb.	1	80	91	63	63	100	34	57	71
	2	0	9	6	0	0	26	11	21
	3	20	0	25	19	0	21	5	0
	4	0	0	6	19	0	18	27	7

corrected independently of the curve type.

Table 2: Correction in sagittal plane

	%	Unk	No Sag. Imb.			Sag. Imb.			S
			T	TL	D	T	TL	D	
SVA	1	60	91	100	87	70	26	35	14
	2	40	9	0	13	0	3	8	4
	3					10	37	11	54
	4					20	34	45	29
PI-LL	1	60	91	100	81	50	21	46	29
	2	40	9	0	19	0	3	8	11
	3					30	29	22	39
	4					20	47	24	21
PT	1	60	73	87	69	10	11	14	18
	2	40	27	13	31	0	3	5	4
	3					70	68	54	64
	4					20	18	27	18

**Conclusions:** The frequency of inadequate SP correction is high and PT is least likely to be corrected. The high rate of alignment failure points to the need for better preoperative planning, intra-operative imaging, and need for increased sagittal plane angular correction to achieve adequate spinal realignment.