CT EVALUATION OF THE EFFECT OF ALICI POSTERIOR AND ANTERIOR SPINAL INTRUMENTATION ON VERTEBRAL ROTATION IN THE CORRECTION OF SCOLIOSIS

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The rotational angle differences of 34 patients who have undergone Ahci anterior spinal spinal instrumentation and Aha posterior spinal instrumentation were evaluated by CT. Twentyfour of them were idiopathic, 5 of them congenital and the other 5 were paralythic scoliosis. In idiopathic scoliosis; average preoperative Cobb angle for thoracic curves were 52.4° corrected to 10 for an average correction of 79.4 % while for lumbar curves the preoperative Cobb angle was 36.3° corrected to 2.2° for an average correction of 93 %. In paralythic scoliosis; the average preoperative Cobb angle was 83° corrected to 24° for an average correction of 71 % and in congenital scoliosis the Cobb anlge changed from an average of 57.8° to 21° post-operatively for an average correction of 63.7 %.

The average RA (AN1) preoperatively was 19° which improved to 8.7° postoperatively for an average correction of 44 % in idiopathic scoliosis. RA (AN2) improved from 18.9° preoperatively to 10.8° postoperatively (29 %) RA(SAG) improved from 9° preoperatively to 9.15° postoperatively (34.4 %). In congenital scoliosis the average RA(ANl) correction was 4% with an average RA(AN2) correction of 17.6 % and an average RA(SAG) correction of 0.5 %. In paralythic scoliosis, the average correction of RA (AN1) was 33.4 %, the average correction of RA (AN2) was 19.2 % and the average correction of RA(SAG) was 32.6 %.

The change in rotation and in the sagittal and frontal planes of the patients who have undergone Aha ASI and PSI are evaluted both on conventional radiographs and CT.

Key Words : Scoliosis, Rotation, Aha Spinal Instrumentation.

MATERIAL AND METHODS :

The Cobb angles were measured preoperatively and postoperatively on conventional A/P and lateral radiographs of 34 patients with scoliosis undergoing Alıcı ASI and PSI. Apical and neutral vertebra were marked. Preoperative rotational angles were measured using the method of Nash and Moe Kyphosis and lordosis were noted from the lateral radiographs. Slices through the apical and neutral vertebrae were obtained by CT. RA (AN1), RA (AN2) and RA(SAG) rotation angles were measured on these slices.

34 patients, 22 female and 12 male with a mean age of 13.7 (range 10-23 yrs.) were evaluated. Eleven patients had right dorsal, 3 had left dorsal and 7 had dorsolumbar, 4 had left dorsolumbar, 4 had left dorsal right lumbar 5 had right dorsal left lumbar curves.

Alıcı ASI and PSI was performed to 17 patients while only PSI was performed to 17. But fusion was performed to all.

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Cobb, RA(ANl), RA(AN2), and RA(SAG) angles were measured preoperatively and postoperatively. The rotation improvement of the apical vertebra was measured and its percentage was calculated.

RESULTS :

In the P/A radiographs obtained in the standing position the mean thoracic curves were mean 52.4° (range 30°-98°) and the mean lumbar curves were mean 36.28° (range 25°-44°). The mean curve of the congenital scoliosis group was 57.8° (range 38°-80°) and the mean curve in the polioinyelitic scoliosis group was 83° (range 50°-135°).

The average RA (AN1) preoperatively was 19° which improved to 8.7° postoperatively for an average correction of 44 % in idiopathic scoliosis. RA (AN2) improved from 18.9° preoperatively to 10.8° postoperatively (29 %). RA(SAG) improved from 9° preoperativcly to 9.15° postoperatively (34.4 %). In congenital scoliosis the average RA(ANl) correction was 4 % with an average RA (AN2) correction of 17.6 % and an average RA(S AG) correction of 0.5 %. In paralythic scoliosis, the average correction of RA(ANl) was 33.4%, the average correction of RA(AN2) was 19.2% and the average correction of RA(SAG) was 32.6 %.

For all of the cases the average RA(ANl) preopcratively was 32.8° which improved the 22.2° postoperatively for an average correction of 35.1 %. The RA (AN1) increased in three curves. The average RA(AN2) preoperatively was 32.6° which improved to 23.8° postoperatively for an average correction of 24.2 %. The RA(AN2) increased in two curves. The average RA(SAG) preoperatively was 31.3° which improved to 21.7° postoperatively for an average correction of 33.8 %. The RA(SAG) increased in one curve. This is summerized in Table 1.

The percentage changes in RA(ANl), and RA (AN2) and RA(SAG) for each curve did not correlate with percentage improvement in the Cobb angle.

DISCUSSION :

This report presents that Alici anterior spinal and posterior spinal instrumentation to improve effectly the rotational deformity in scoliosis by 35.1 % as measured by RA(ANl). The RA(AN2) improves by 24.2 % and RA(SAG) improves by 33.8 % in all scoliotic cases.

Aaro and Dahlbourn reported after standard Harrington (1) instrumentation, 6 : improvement in the RA (SAG) Malcolm et al reported 24 % in the RAML and 14 % in the RA(SAG) after CD insturmentation (4). Clark and Shufflcbargcr reported the 39 % thoracic improvement and 22 % lumbar improvement in rotation

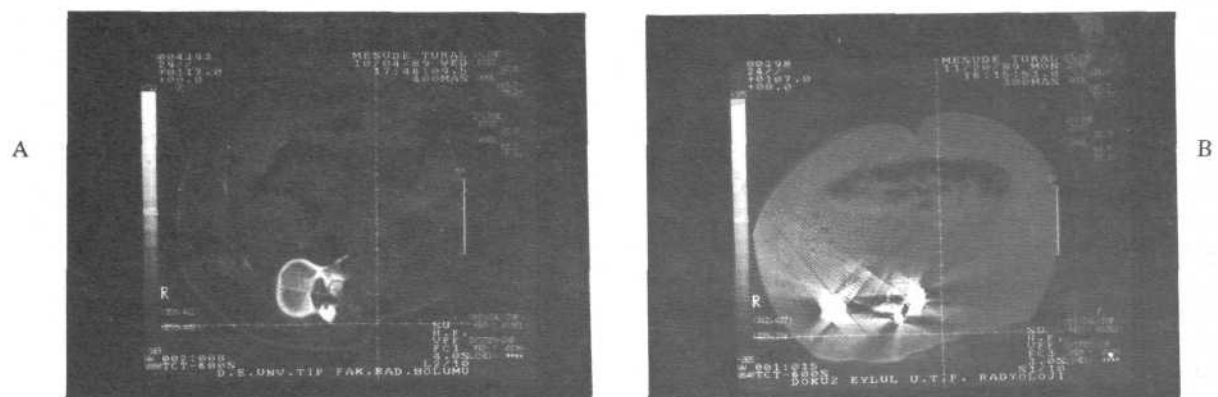|	IDIOPATHIC			CONGENITAL			PARALYTHIC			TOTAL OF ALL CASES		
	PRE-OP (°)	POST-OP (°)	CORR.%	PRE-OP (°)	POST-OP (°)	CORR.%	PRE-OP (°)	POST-OP (°)	CORR.%	PRE-OP (°)	POST-OP (°)	CORR.%
COBB	T 52.4 L 36.3	10° 2.2°	79.4 93	57.8	21	63.7	83	24	71	61.7	17	73.6
RA AN1	19	8.7°	44	25.5	23.8	4	66.7	43.1	33.4	32.8	22.2	35.1
RA AN2	18.9	10.8°	29	28.1	23.1	17.6	61.2	48.2	19.2	32.6	23.8	24.2
RA SAG	19	9.15°	34.4	26.3	23.9	0.5	57.5	41	32.6	31.3	21.7	33.8

Table 1
T - Thoracal
L - Lumbar

Fig. 1 A: Single slice CT scan is obtained through the apical vertebra preoperatively.
B: Single slice CT scan is obtained through the apical vertebra postoperatively.
(from the same vertebra)

(5). Dubousset reported the 41 % rotatory improvement (2,3).

CONCLUSION :

We believe that we have proved the efficiency of the Alıcı Spinal Instrumentation on the rotation changes, after careful CT evaluations.

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