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Surgical Outcome of Inferior Oblique Anteriorization for Unilateral Superior Oblique Palsy with Large Angle Hypertropia

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Superior oblique palsy (SOP) is a common cause of cyclovertical strabismus [1], unilateral is more common than bilateral involvement [2]. Congenital SOP is more common than the acquired palsies 2^{ry} to trauma or microvascular diseases [3]. Treatment of SOP is indicated to resolve diplopia, vertical and torsional deviations or torticollis [4].

Surgical treatments for unilateral SOP include inferior oblique (IO) weakening (recession, myectomy or disinsertion), superior oblique strengthening (tucking, resection, or advancement), ipsilateral superior rectus recession, and contralateral inferior rectus recession [5].

For large angle vertical deviation (VD), some studies reported favorable outcomes with two or more muscle surgeries [6]. Other studies indicated that isolated IO myectomy can correct large angle VD associated with SOP effectively [7,8]. Others preferring IO anteriorization more than myectomy [9]. However, the relative efficacy of IO anteriorization for treatment of large angle VD is difficult to assess because the sparse literature.

The aiming of this study is to assess the effect of unilateral IO anteriorization as a single muscle surgery on large angle hypertropia (≥ 20PD), abnormal head posture (AHP), and degree of IO muscle overaction in patients with unilateral SO palsy.

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PATIENTS AND METHODS

A total of 28 patients, underwent inferior oblique anteriorization for treatment of ipsilateral SOP with large angle hypertropia ≥ 20 PD.

SOP diagnosed by: hyperdeviation of the affected eye that increase in contra-lateral gaze, increase with ipsilateral head-tilt (positive head-tilt test) and in downgaze [10].

Exclusion criteria:

- Previous strabismus surgery,
- Other motility disorder as horizontal deviation,
- Amblyopia,
- Unilateral SOP with hypertropia < 20PD in primary position,
- Bilateral SOP,
- Patients who miss the follow.

All patients underwent ophthalmological exam. Include:

- BCVA,
- anterior segment and Fundus exam.
- Ocular motility tested for ductions, versions.
- Measurement of squint angles at near, far in all cardinal directions.
- Excyclotorsion was assessed by fundus examination and subjectively using double Maddox rod in cooperative patients.
- Grading of inferior oblique overaction (0 to +4), according to the upward deviation of the pupil in adduction [11].

Patients were evaluated preoperative and 3 months postoperative for vertical deviation (VD) in primary position and in adduction. Residual hypertropia $\leq$ 6 PD in primary position postoperatively is a successful outcome.

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RESULTS

Demographic data of the patients

Study parameter	Result
Age (years), mean ± SD	30.75 ± 17.05
Sex	
Male	15 (53.6%)
Female	13 (46.4%)
Side of involved eye	
OD	12 (42.9%)
OS	16 (57.1%)
Head Tilt	
No head tilt	5 (17.9%)
Head tilt	23 (82.1%)
BCVA (Log MAR), mean ± SD	
OD	0.01 ±17.9%
OS	0.01 ± 82.1%
SE, mean ± SD	
OD	-0.51 ± 1.74
OS	-0.68 ± 1.74

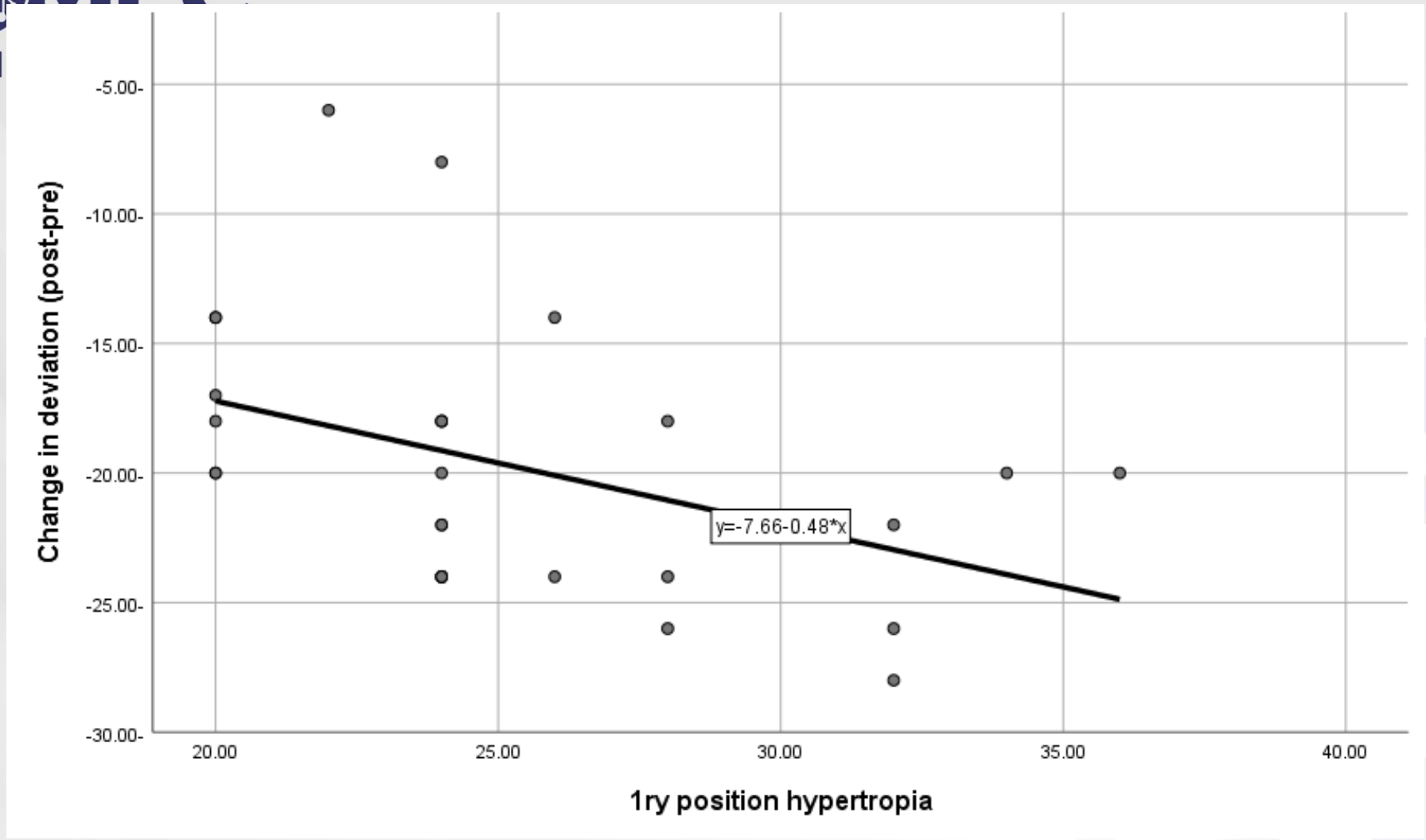
The Preoperative and postoperative clinical measurements

	Preoperative Angle Mean ± SD	Postoperative Angle Mean± SD	P value
1ry position hypertropia (PD)	25.29 ± 4.50	5.54 ± 5.25	< 0.001
Hypertropia in contralateral gaze (PD)	30.57 ± 7.89	8.50 ± 5.27	< 0.001
IOOA	2.61 ± 0.99	0.39 ± 0.50	< 0.001

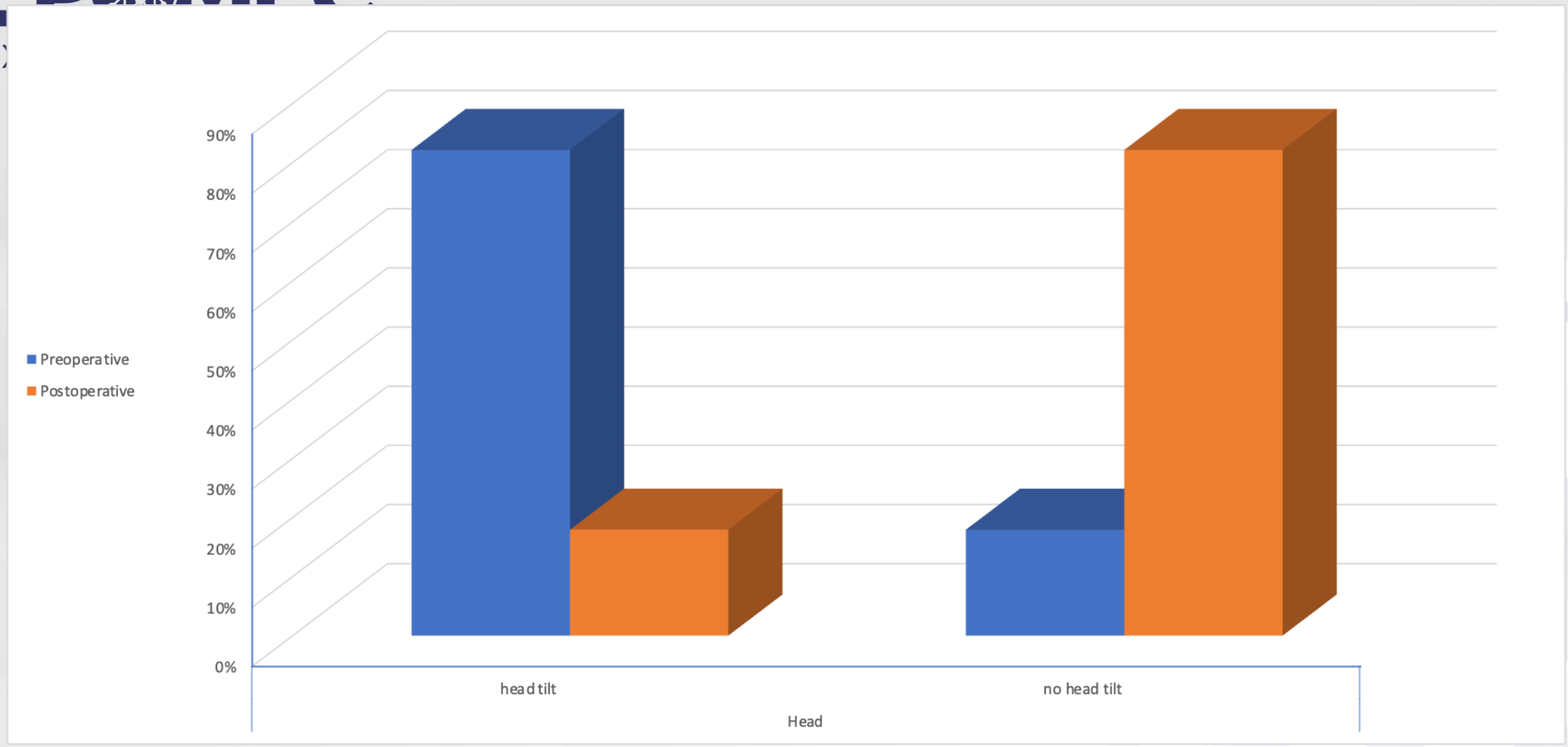
Correlation between the change in vertical deviation (postoperative minus preoperative) and the preoperative deviation in 1ry position.

		Change in VD (postoperative minus preoperative)
1ry position hypertropia	Correlation Coefficient	-0.501
	P value	0.007

Correlation between the change in vertical deviation (postoperative minus preoperative) and the preoperative deviation in 1ry position



Change in head tilt; effect of surgery



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CONCLUSION

The results of our study declared that IO anteriorization has a good outcome in correction of large angle hypertropia and AHP due to superior oblique palsy with low rate of undercorrection.

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