

# Primary Position Deviation in Duane's Syndrome\*

GUY Y. WONG, M.D.

*Research Associate, Smith-Kettlewell Institute of Visual Science, San Francisco, California; Chief, Ophthalmology Department, Santa Clara Permanente Medical Center, Santa Clara, California; Co-Director, Stanford University Medical Center Strabismus Service, Stanford, California*

ARTHUR JAMPOLSKY, M.D.

*Director, Smith-Kettlewell Institute of Visual Science, Pacific Medical Center, San Francisco, California*

ALAN B. SCOTT, M.D.

*Senior Investigator, Smith-Kettlewell Institute of Visual Science, Pacific Medical Center, San Francisco, California*

JEAN YOUNG, Certified Orthoptist

*Santa Clara Permanente Medical Center, Santa Clara, California*

**Introduction.** The diagnosis of an esotropic patient as having Duane's syndrome is not always clinically evident. There has been a paucity of attention directed to the size of the esodeviation in patients with this syndrome. The purpose of this paper is to point out the diagnostic significance of the size of the primary deviation in patients with, or suspected of having, Duane's syndrome.

**Methods.** Of the 93 patients with Duane's syndrome seen, 50 with an esodeviation were included in the study. Patients with orthophoria, exodeviation, bilateral involvement, and vertical misalignment were excluded. All patients were older than 18 months. Diagnosis was based on the presence of limitation of abduction-adduction, retraction, up or

down shoots, and palpebral fissure changes on adduction (3, 1, 5). Electromyographic recordings were made in some cases.

The head is in the primary position when the head or sound eye is made to look at a distant object without a head turn. The deviation was measured by the prism cover test. When this was not possible, it was assessed by Krinsky or Hirschberg corneal reflex methods.

**Results and Discussion.** The results are summarized in Table 1. The size of the esodeviation was 30 prism diopters ( $^{\Delta}$ ) or less in our entire population of 50 patients (fig. 1). The average size deviation was  $16^{\Delta}$  of esotropia in the primary position.

Dividing the patients arbitrarily into groups of 1-10 $^{\Delta}$ , 11-20 $^{\Delta}$ , and 21-30 $^{\Delta}$ , there were 17 patients

---

\* This study was supported in part by Kaiser Foundation Research Institute Grant 141-9875-72-76.

**TABLE 1.**  
PRIMARY POSITION ESODEVIAION IN DUANE'S SYNDROME  
(50 PATIENTS)

Size of deviation (prism diopters)	No. of patients
1-10	17
11-20	21
21-30	12

Average esodeviation = 16 prism diopters

in the 1-10<sup>a</sup> group, 21 patients in the 11-20<sup>a</sup> group, and 12 in the 21-30<sup>a</sup> group.

A patient with an esodeviation of greater than 30<sup>a</sup>, on the basis of this study, would be excluded as having a possible Duane's syndrome. One should be prompted to investigate other possible diagnoses, for example, the usual types of esotropia, iatrogenic or congenital structural anomalies, and sixth nerve palsy.

In the usual type of esotropia having greater than 30<sup>a</sup> of deviation, the feasible goals include alignment of the eyes in the primary position, provision of a normal range of rotation, and restoration of binocular function. Treatment should be

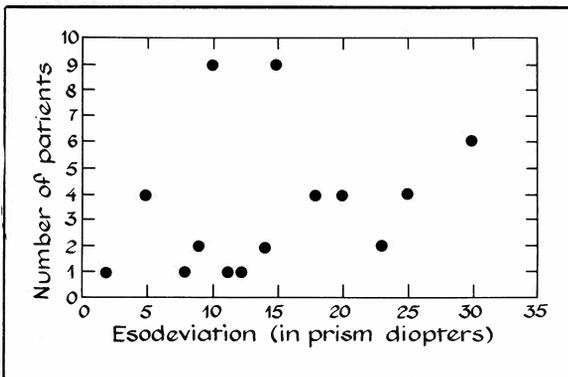


Fig. 1—Distribution of size of esodeviation in 50 patients with Duane's syndrome.

started as soon as possible to enhance the possibility of bifoveal fusion. This is in contrast to the patient with Duane's syndrome where fusion is generally accomplished by an abnormal head posture, and no urgency exists. Feasible goals are the alignment of the eyes in the primary position, abolishment of the head turn, reduction of the retraction, reduction of palpebral fissure narrowing, and shift of the horizontal rotation range to a more useful position. All can be improved by recession of the medial rectus muscle of the affected eye (4). Additional horizontal correction is possible by operating on other horizontal muscles (4, 2).

**Summary.** All of the 50 patients with Duane's syndrome with esotropia had a primary position deviation of 30 prism diopters or less. Over half of the patients had a deviation of 15 prism diopters or less. A patient with an esodeviation of greater than 30 prism diopters is unlikely to have Duane's syndrome, and efforts should more profitably be directed to establishing another diagnosis.

*Authors' note:* We thank Fletcher Woodward for statistical help.

REFERENCES

1. AEBLI, R. Retraction syndrome. *Am. J. Opth.* 10:602-610, 1933.
2. BROWN, H. W. *Congenital structural anomalies of muscles.* Strabismus Ophthalmic Symposium II. St. Louis, C. V. Mosby Co., 1958.
3. DUANE, A. Congenital deficiency of abduction, associated with impairment of adduction, retraction movements, contraction of palpebral fissure, and oblique movements of the eye. *Arch. Opth.* 34:133-157, 1905.
4. SCOTT, A. B. AND WONG, G. Y. Duane's syndrome, an electromyographic study. *Arch. Opth.* 87:140-147, 1972.
5. WONG, G. Y., SCOTT, A. B., AND JAMPOLSKY, A. Clinical and surgical findings in Duane's syndrome. *Invest. Opth.* 9:983-984, 1970.