

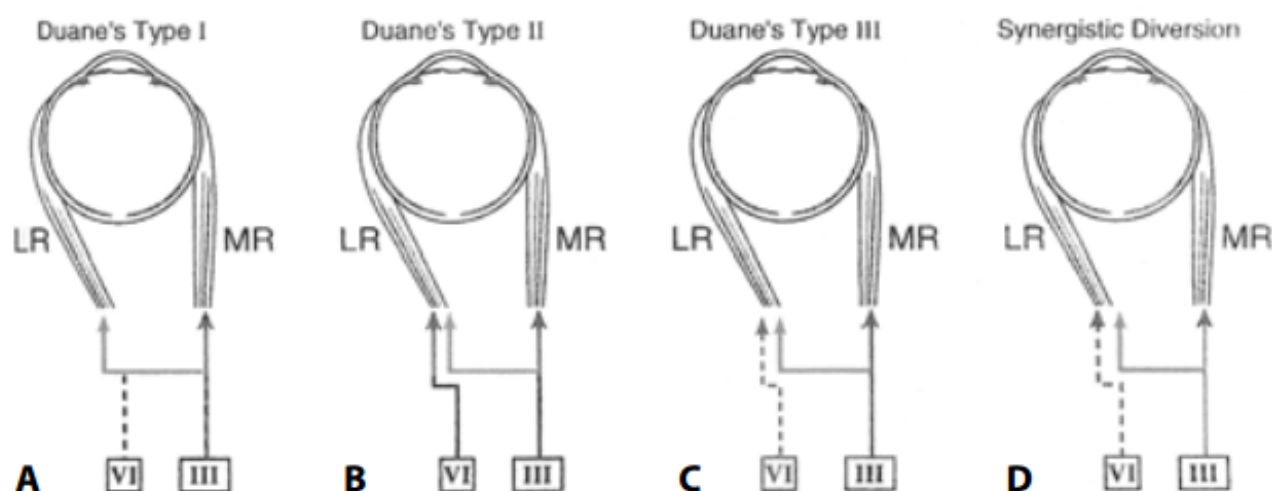
# DUANE'S RETRACTION SYNDROME



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**FIGURE 10-11A–D.** Diagrammatic representation of misdirection of nerve fibers in Duane's syndrome. The aberrant nerve pathway is shown in *red*, and the *dotted lines* represent nerve hypoplasia or agenesis. **(A)** type I: poor abduction and good adduction. Agenesis of the sixth nerve and part of the third nerve splits to innervate both the medial and the lateral rectus muscles, but most of the medial rectus nerve goes to the medial rectus muscle so adduction is intact. **(B)** Type II: poor adduction and good abduction. Sixth nerve is intact and innervates the lateral rectus muscle, but the medial rectus nerve splits to innervate the medial and lateral rectus muscles. There is poor adduction because the lateral rectus contracts against the medial rectus muscle. **(C)** Type III: poor adduction and poor abduction. Agenesis of the sixth nerve and part of the third nerve splits to innervate both the medial and the lateral rectus muscles. The split is equal so the eye does not move in or out. **(D)** Synergistic divergence and paradoxical abduction on attempted adduction. Agenesis of the sixth nerve and part of the third nerve splits to innervate both the medial and the lateral rectus muscles, but most of the medial rectus innervation goes to the lateral rectus muscle. When the eye attempts to adduct, it abducts because the medial rectus nerve innervates the lateral rectus muscle.



## TABLE 10-6. Classification of Duane's Syndrome.

### Type I Duane's: most common

Poor abduction and good adduction. The medial rectus muscle receives most of the medial rectus nerve innervation and the lateral rectus receives minimal innervation from the medial rectus nerve, with agenesis of the sixth nerve. Because the medial rectus receives most of the innervation, the Duane's eye is usually fixed in an adducted position with an esotropia in primary position, and there is a compensatory face turn in the direction of the Duane's eye (i.e., left face turn for a left Duane's type I).

### Type II Duane's: least common, extremely rare

Poor adduction and good abduction. EMG recordings show the lateral rectus muscle to contract appropriately on abduction, but it also contracts paradoxically on adduction; this probably represents a partial innervation of the lateral muscle by the sixth nerve nucleus (as purposeful abduction is present), plus splitting of the medial rectus nerve to innervate the medial and lateral rectus muscles.

### Type III Duane's: second most common

Poor adduction and poor abduction (the eye has little horizontal movement). Equal innervation of the medial and lateral rectus muscles by the medial rectus nerve, with congenital absence of the sixth nerve. Because the medial and lateral forces are similar, the eye will rest in approximately primary position and there will be no significant face turn. In some cases, an exotropia is present in primary position because the lateral rectus receives slightly more innervation than the medial rectus muscle; this causes a face turn away from the Duane's eye.

### Synergistic divergence: extremely rare

Paradoxical abduction on attempted adduction and poor abduction. Little or no innervation of the lateral rectus by the sixth nerve. Most of the medial rectus nerve goes to the lateral rectus muscle. On attempted adduction, the lateral rectus is stimulated by the medial rectus nerve and the eye paradoxically abducts.