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Chapter 3

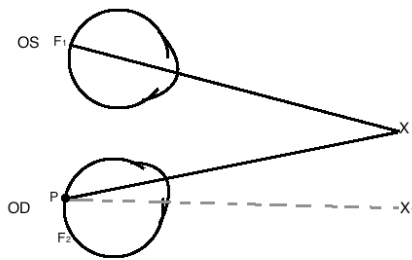
DIPLOPIA

I. BINOCULAR DIPLOPIA

Two images seen of one object -- non-corresponding *retinal* elements being stimulated.

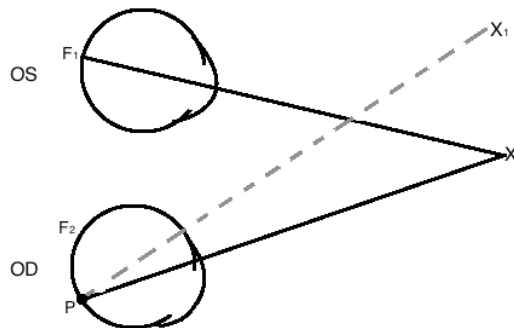
Fixation object stimulates the fovea of fixing eye and a point other than the fovea in the deviating eye and therefore is seen *double*. The two retinal points stimulated do not have the same visual direction.

Right Esotropia



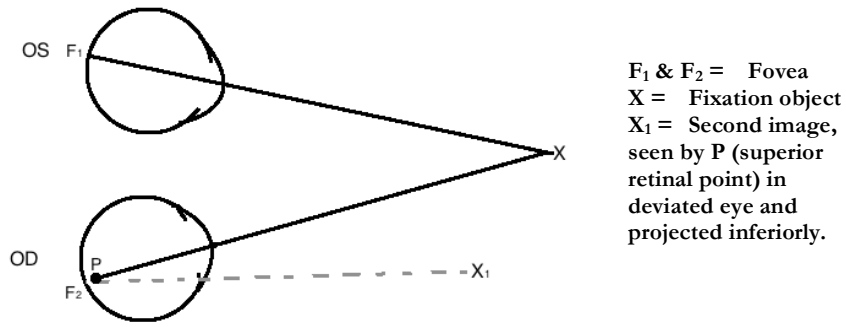
F_1 & F_2 = Fovea
 X = Fixation object
 X_1 = Second image,
homonymous
diplopia seen by P
(nasal retinal point)
in deviated eye.

Right Exotropia



F_1 & F_2 = Fovea
 X = Fixation object
 X_1 = Second image,
heteronymous diplopia
seen by P (temporal
retinal point) in
deviated eye.

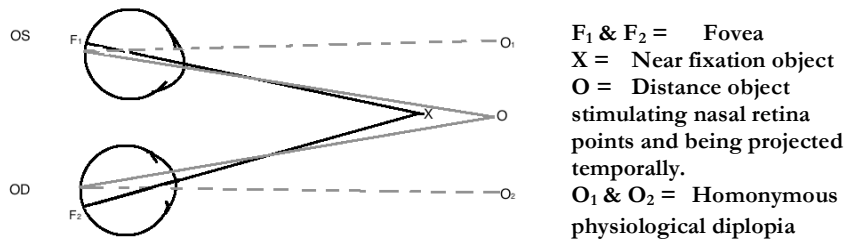
Right Hypertropia



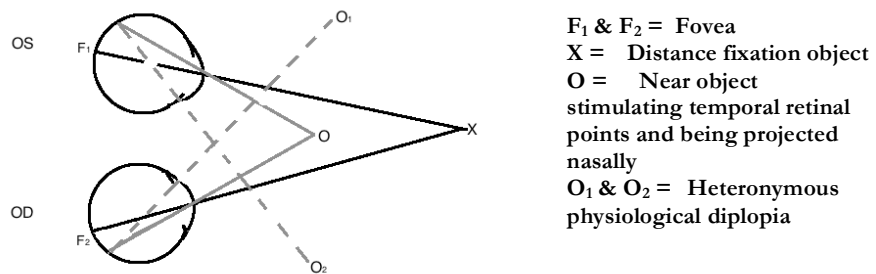
II. PHYSIOLOGICAL DIPLOPIA

Objects *situated* nearer than the fixation object or *beyond* the fixation object are falling on *non-corresponding retinal* elements and seen double.

1. Homonymous or uncrossed diplopia



2. Heteronymous or crossed diplopia

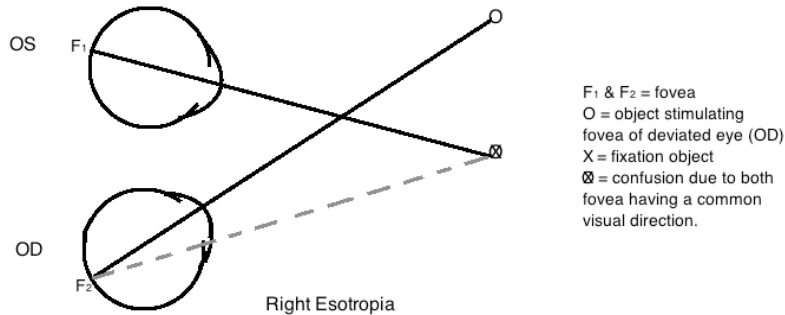


In physiological diplopia we are normally *conscious* and can easily be aware of it (Teach method). This phenomenon is used in treatment of *heterophoria*.

III. PATHOLOGICAL DIPLOPIA

Onset of manifest deviation - diplopia or confusion may occur.

Confusion is a condition in *which dissimilar objects stimulate* both foveas and are *projected* to the same position in space. This is *caused* by each fovea having the same visual direction.



IV. UNIOCCULAR DIPLOPIA

Two images seen from one eye.

A. Pathological unioocular diplopia

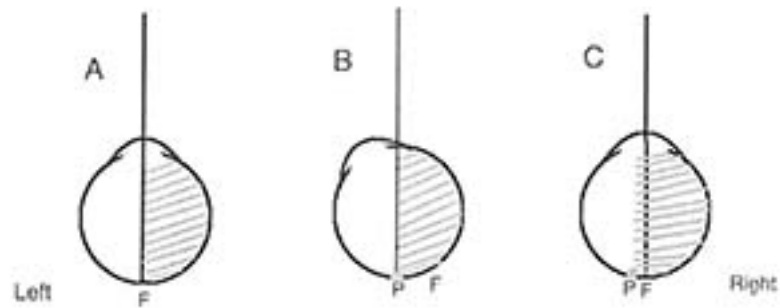
1. *Large* displacement of images.
 - a. Dry eyes
 - b. Displacement of lens
 - c. Two pupils or coloboma of iris
 - d. Retinal detachment – involving the macula
Maculopathy
sub-retinal neovascular membrane
macular epiretinal membrane
2. *Small* displacement of images – one image behind the other.
 - a. Uncorrected astigmatism
 - b. Lens opacities
 - c. Air bubbles in the aqueous or vitreous

- B. Physiological unocular diplopia. Patient may complain of seeing two images of one object during treatment of ARC or on the major amblyoscope. Because of dual projection of a retinal point, abnormal projection co-exists before ARC is overcome.

V. PARADOXICAL DIPLOPIA

Heteronymous diplopia occurring post-operatively where the visual axes are now parallel but the fovea continues to project abnormally.

ARC must have existed pre-operatively.



- A. Represents a normal right eye – darker area represents the nasal visual field and the light area represents the temporal visual field.
- B. Represents a patient with a right esotropia and an abnormal retinal correspondence. The darker area to P represents the nasal visual field – the lighter area represents to temporal visual field.
- C. Represents “B” after the eye has been straightened by surgery. The area PF continues to represent nasal visual field resulting in crossed diplopia where in normal correspondence there would be uncrossed diplopia – a paradox.