

ANCILLARY TESTS

DIPLOPIA AND HESS CHARTING

FDT AND FGT

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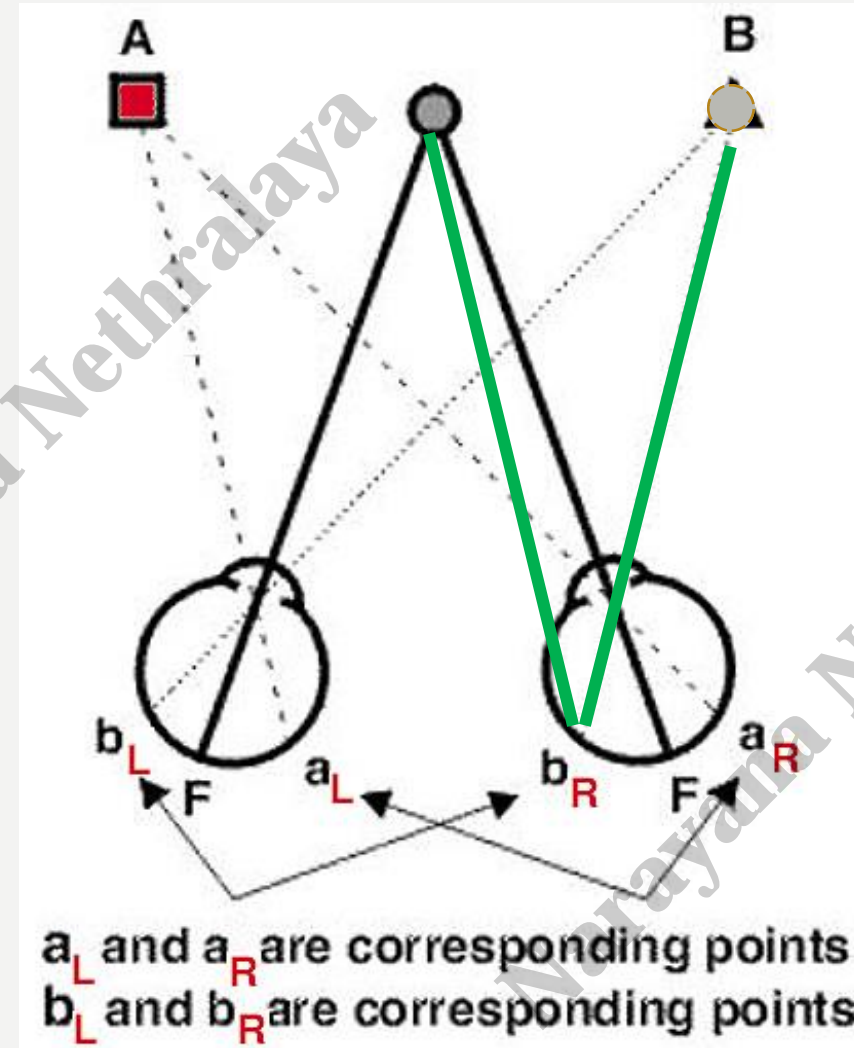
PRINCIPLE

- **Diplosopic principle** - One object perceived as two
DIPLOPIA
- **Haplosopic principle** - Each eye is presented with different objects
CONFUSION

DIPLOPIA

- Misalignment of visual axes
- Image falls on foveal point of one eye and non foveal point of the other eye

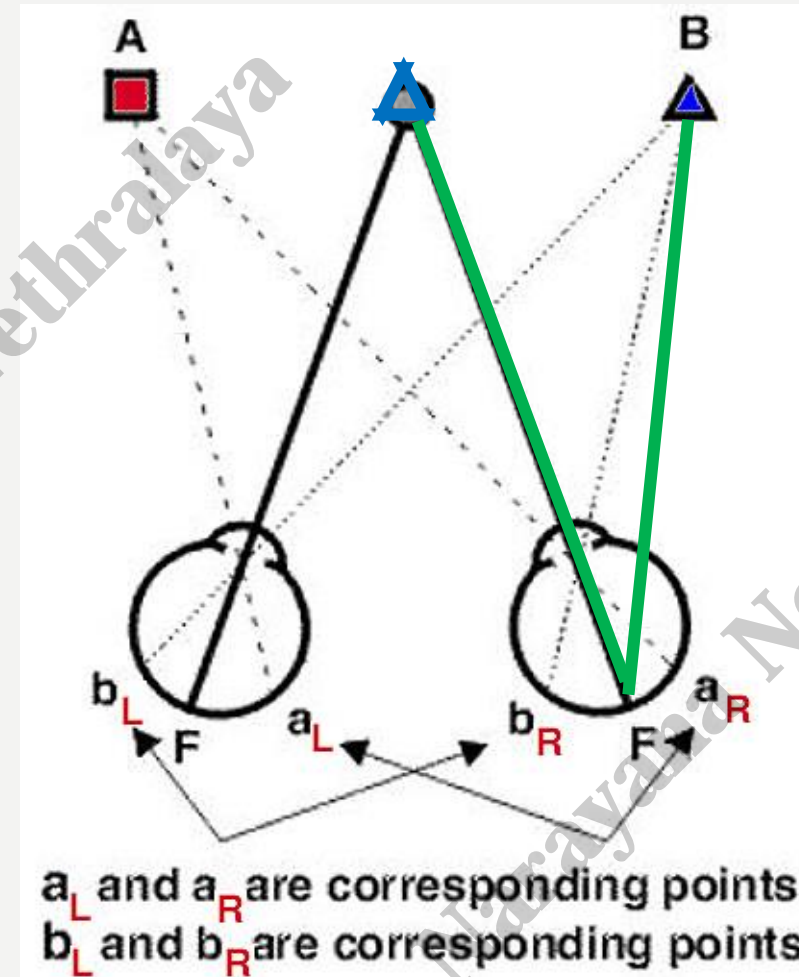
PRINCIPLE OF DIPLOPIA CHARTING



CONFUSION

- Perception of two different images on the fovea of the two eyes
- Objects actually separated in the physical space are imaged on corresponding areas and therefore seen overlapping

PRINCIPLE OF HESS CHARTING



WHY DO DIPLOPIA CHARTING

Helps you understand the type of squint

Helps to detect incomitance

Helps in diagnosing subtle nerve palsies

Help to monitor the course of nerve palsy – regression / progression

DIPLOPIA CHARTING ANALYSIS SEQUENCE

- Look at the chart to see which is left and right – conventionally right is to your right
- See if placement of filters is indicated – by convention red in front of right

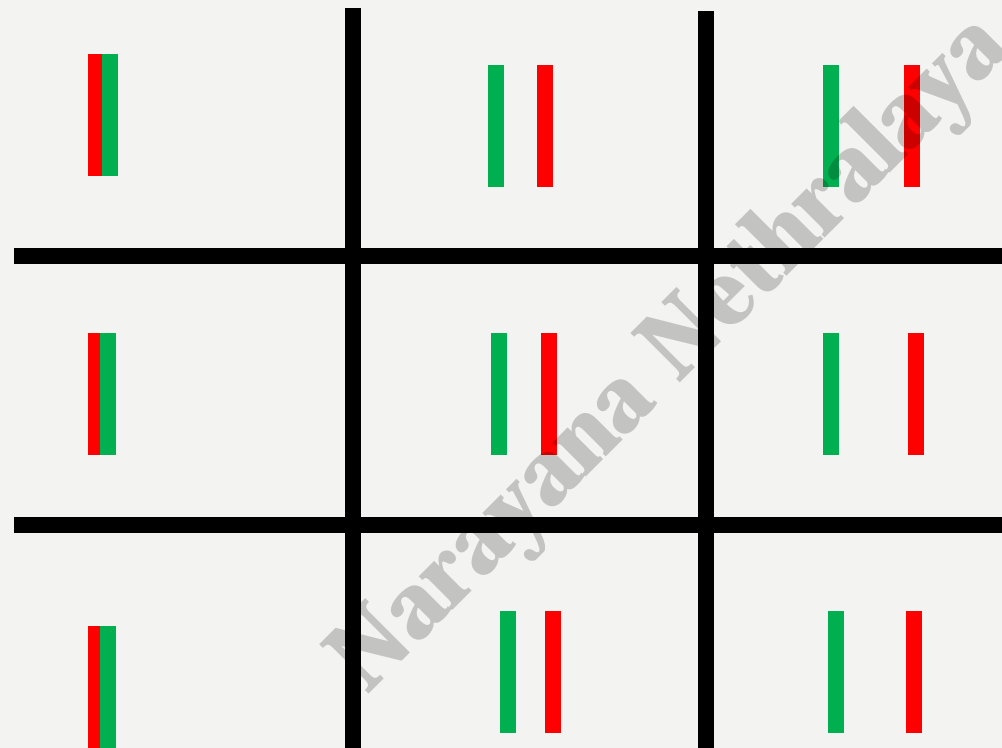
DIPLOPIA CHARTING ANALYSIS SEQUENCE

- Horizontally uncrossed - ESOTROPIA
- Horizontally crossed - EXOTROPIA
- Vertically separated and crossed - VERTICAL RECTI
- Vertically separated and uncrossed - OBLIQUES

EXAMPLES



EXAMPLES



Horizontal

Uncrossed

Maximum in right gaze

Min/ Absent in left gaze

RIGHT SIXTH NERVE PALSY

EXAMPLES



Horizontal

Crossed

Maximum in right gaze

Min/ Absent in left gaze

LEFT MEDIAL RECTUS PALSY/ LIMITATION

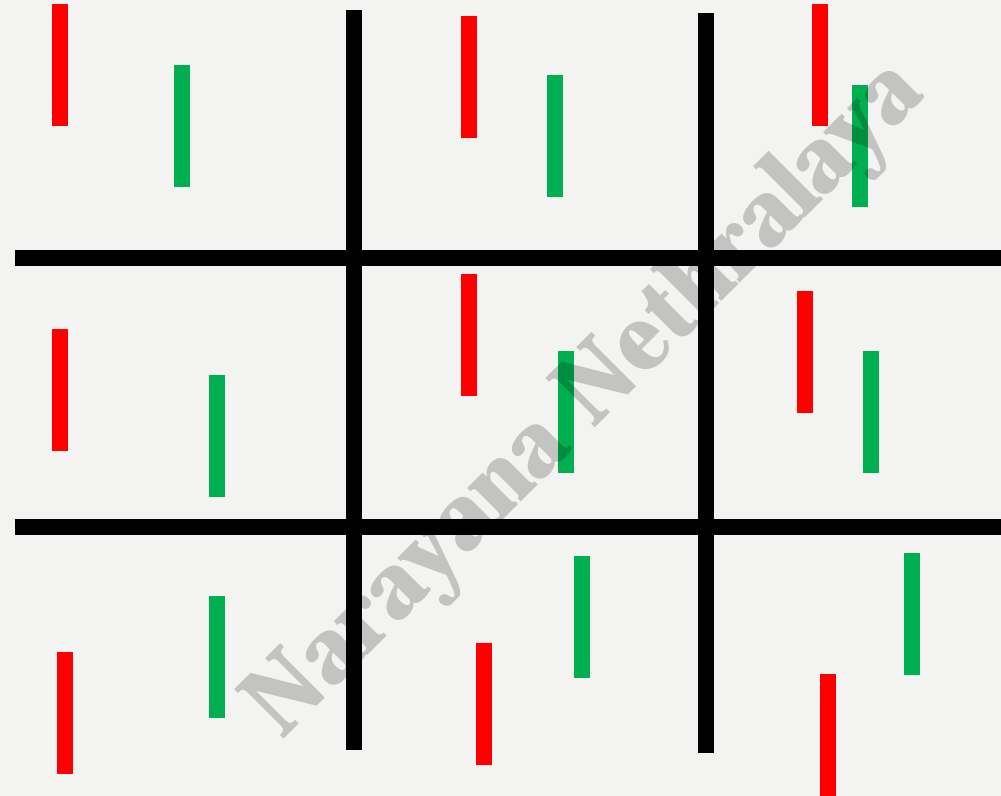
EXAMPLES



- Vertical
- Uncrossed
- Incyclotorsion of right image → excyclotorsion of RE
- Maximum separation in dextrodepression

LEFT SO PASLY

EXAMPLES



- Vertical and horizontal
- Crossed
- Maximum horizontal separation in left gaze
- Vertical separation varying

RIGHT THIRD NERVE PALSY

EXAMPLES



RIGHT SUPERIOR RECTUS LIMITATION

&

RIGHT LATERAL RECTUS LIMITATION

- Vertical and horizontal
- Uncrossed
- Maximum horizontal separation in right gaze
- Max vertical separation in Dextroelevation

WHY DO HESS CHARTING

- Helps you understand the amount of limitation of muscle action
- Can differentiate acute from chronic palsy
- Can differentiate cause for limitation of movement : Palsy and Restriction
- Can help in assessing course – progression/ regression
- Can detect multiple muscle/ nerve involvement

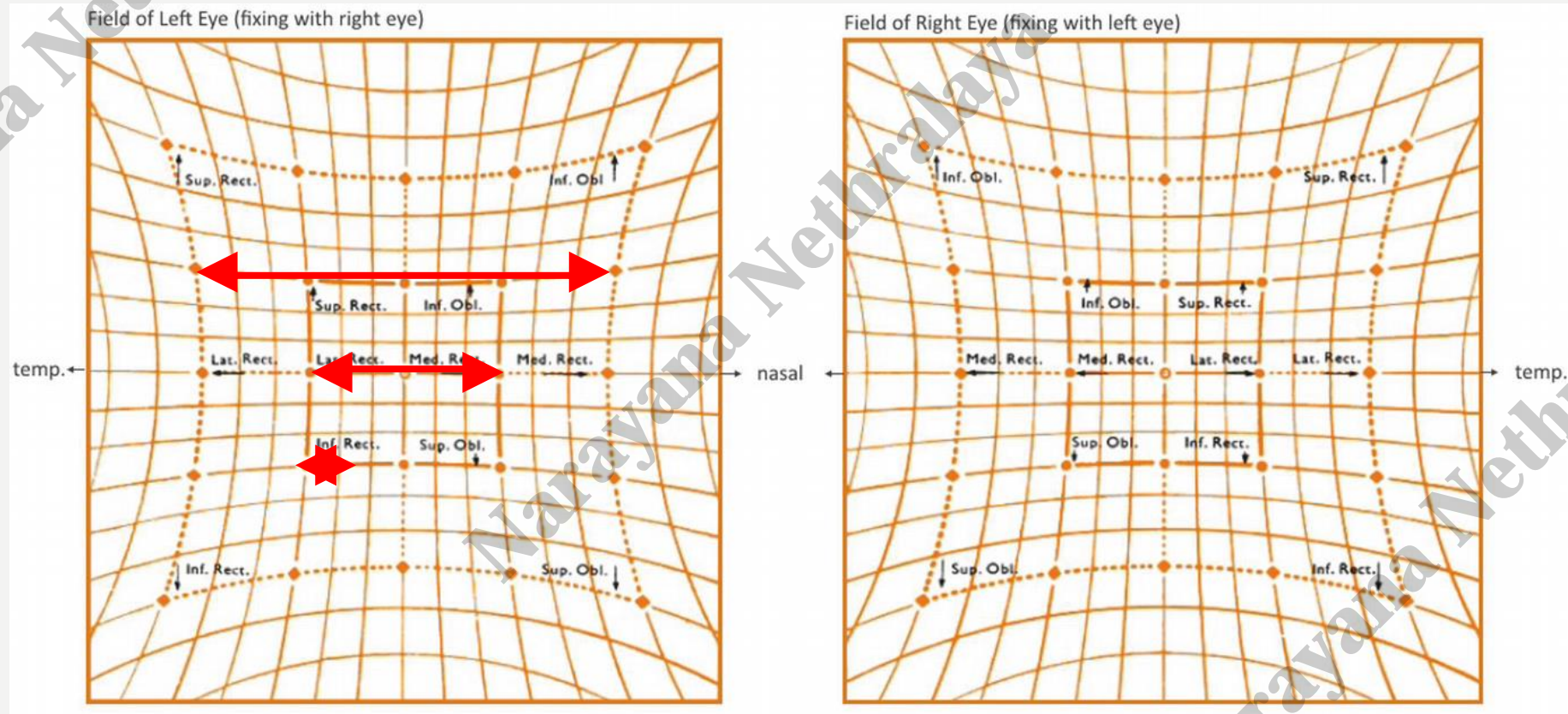
HESS CHARTING ANALYSIS SEQUENCE

- A total of 25 points are analyzed
- 2 set of points – inner and outer square

IMPORTANT NUMBERS

- 50 cm
- 15 degree
- 30 degree
- 5 degree

HESS CHARTING



HESS CHARTING

POSITION

SIZE — inner and outer
field and proportion

SHAPE

HESS CHARTING ANALYSIS SEQUENCE

1. Look at the position of centre of each eye
2. Identify the eye with the smaller field – this indicates the affected eye
3. Look for underaction of muscle (internal to the normal field)
4. Look if there is overaction of contralateral agonist or ipsilateral antagonist – Helps differentiate restriction from limitation due to palsy.

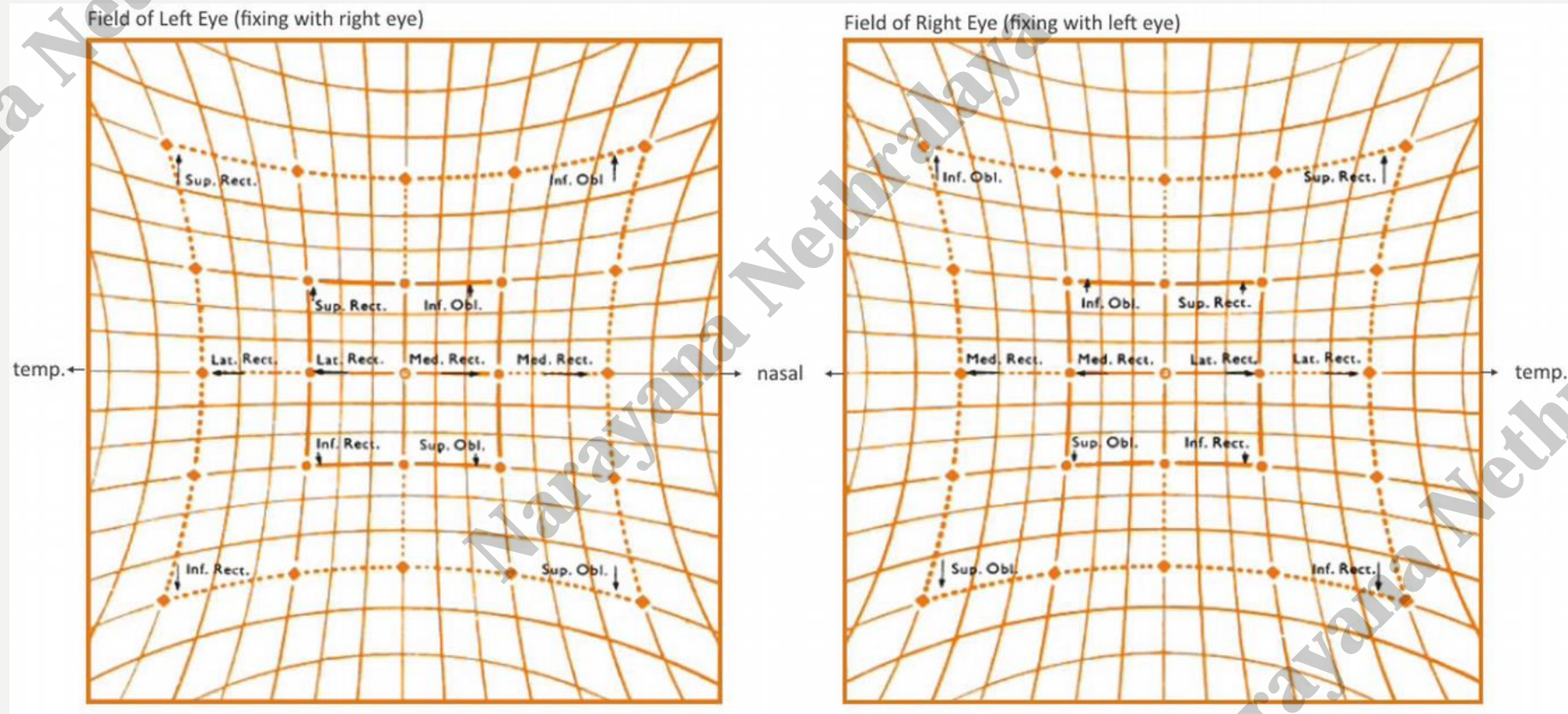
HESS CHARTING

- Also helps assess onset of palsy – acute or chronic- onset of sequelae of nerve palsy
 1. Overaction of C/L agonist
 2. Overaction of I/L antagonist
 3. Overaction of C/L antagonist
- Limitation in opposite directions → mechanical restriction

SPECIAL POINTERS

- LEES and HESS screen depend on retinal projection
- Comitization makes it difficult to identify the affected eye
- Sloping indicates: A/V pattern

HESS CHARTING



HESS CHARTING ANALYSIS SEQUENCE

1. Look at the position of centre of each eye
2. Identify the eye with the smaller field – this indicates the affected eye
3. Look for underaction of muscle (internal to the normal field)
4. Look if there is overaction of contralateral agonist or ipsilateral antagonist – Helps differentiate restriction from limitation due to palsy.
5. Look at the shape

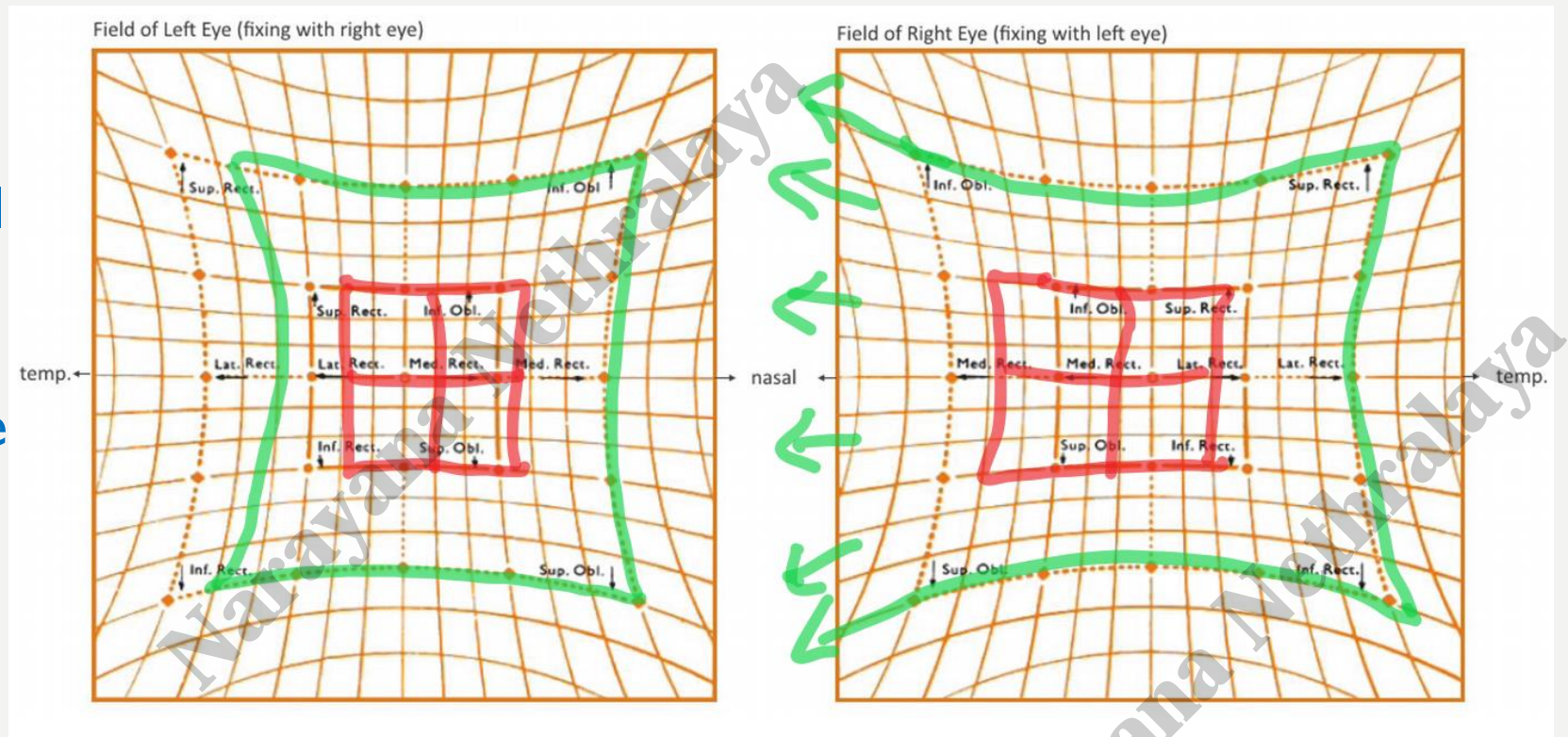
HESS CHARTING

Centre shifted in by 1 square \rightarrow 5° Esotropia

Smaller field- Left eye

Underacting muscle-
Left LR

Acute palsy



ACUTE LEFT LR PALSY

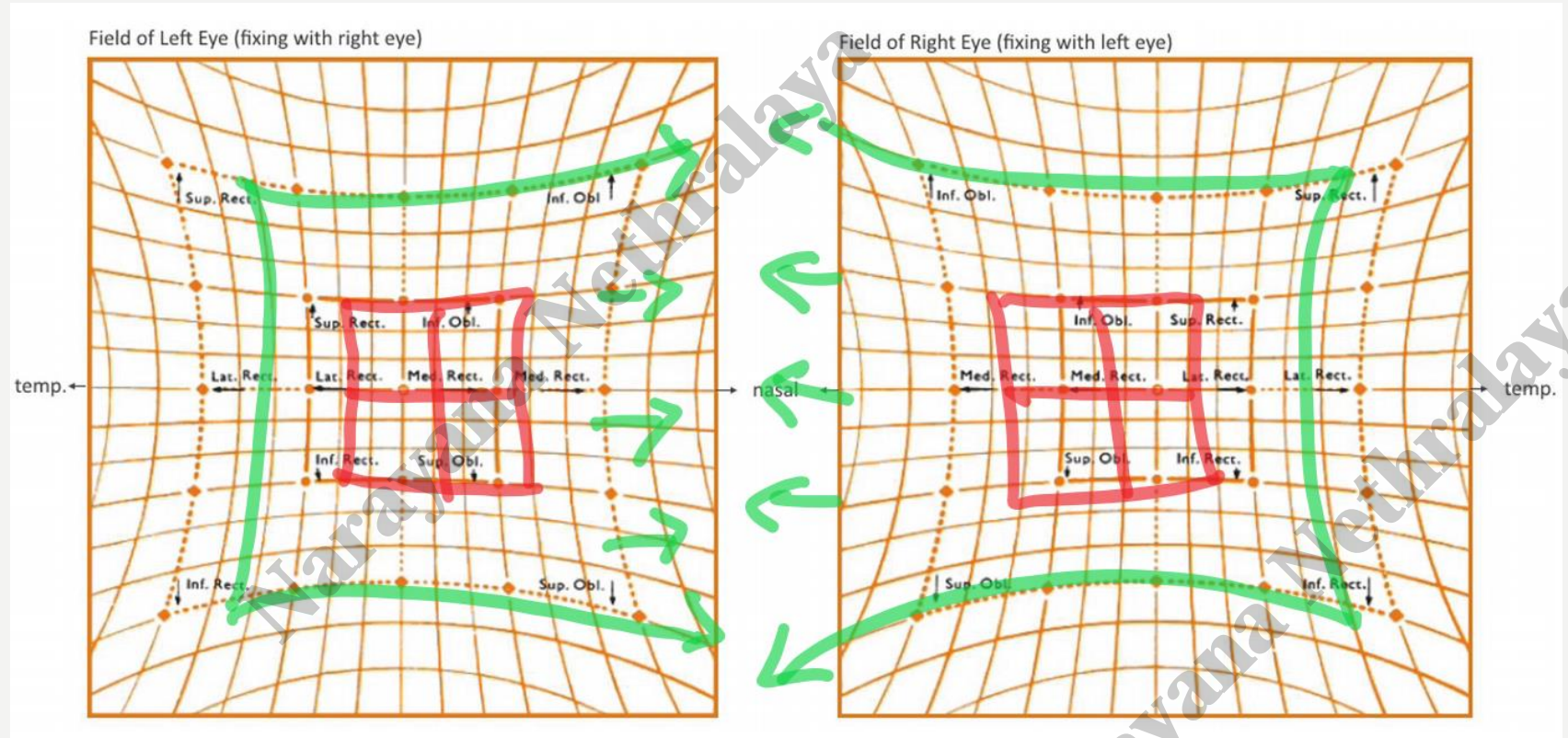
HESS CHARTING

Esotropia

Left eye

Left LR

Chronic palsy



CHRONIC LEFT LR PALS

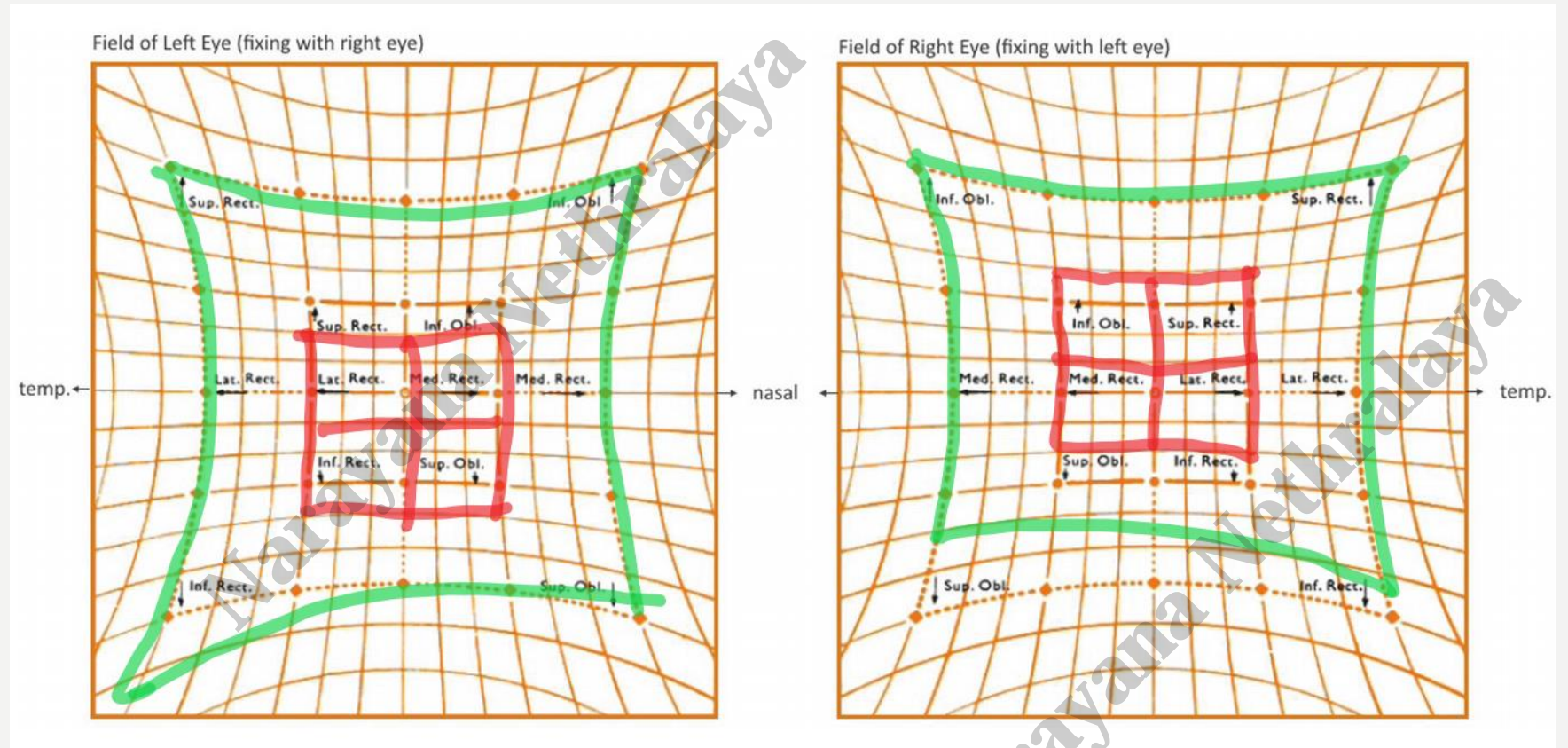
HESS CHARTING

Right hypertropia

Right eye

Right SO

Acute palsy



ACUTE RIGHT SO PALSY

HESS CHARTING

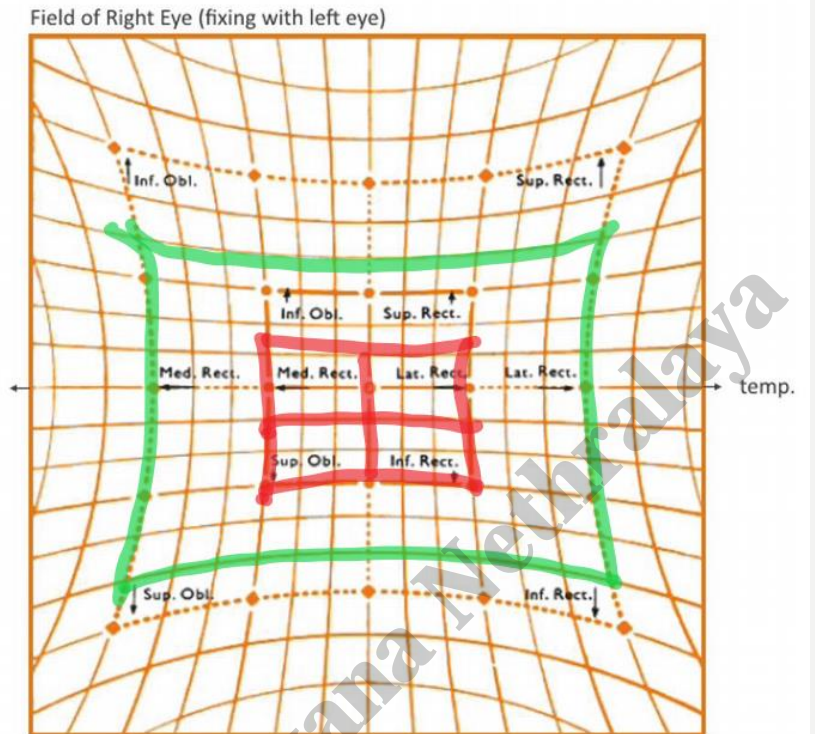
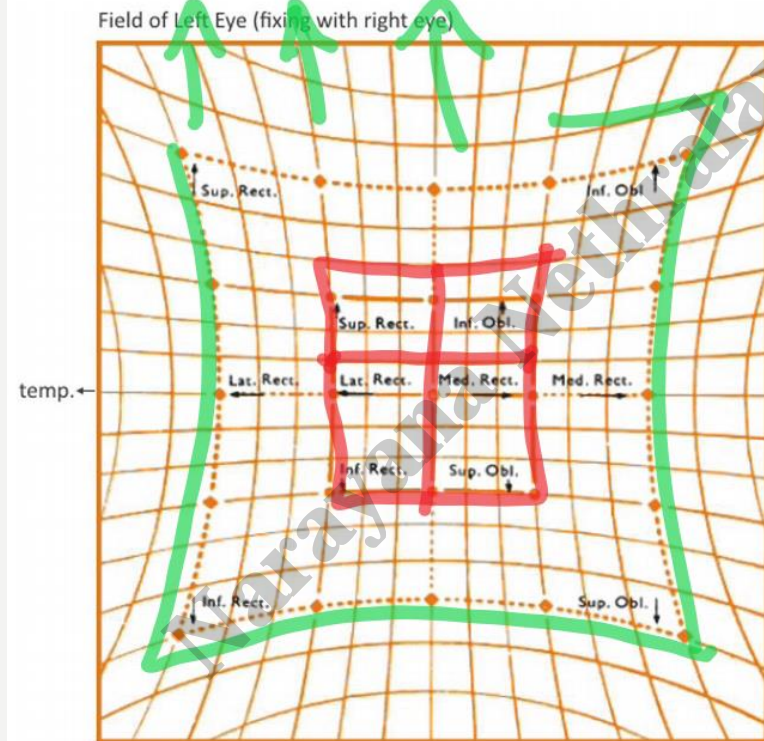
Right hypotropia

Right eye

Right SR & IO

Limitation in opp
Directions

→ RESTRICTION



**RIGHT BLOW OUT FRACTURE – IR
ENTRAPMENT**

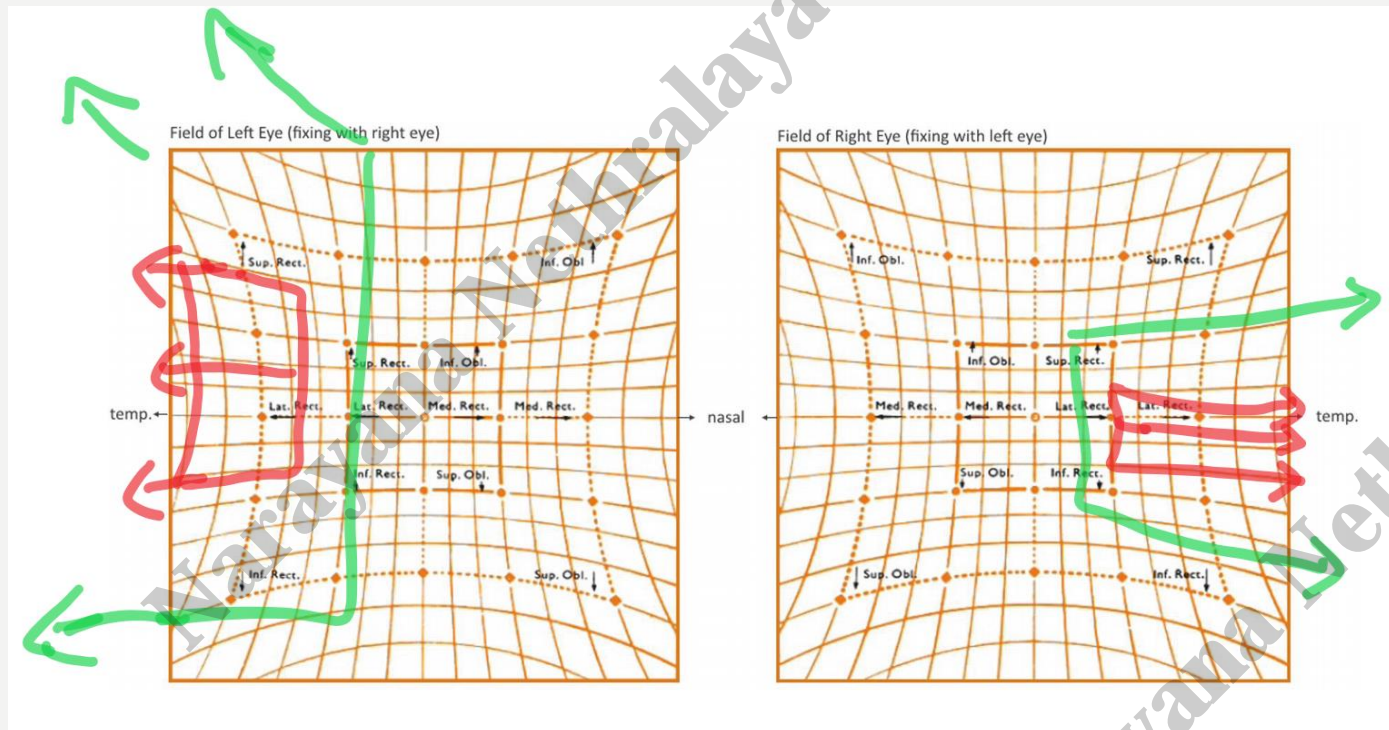
HESS CHARTING

Right exotropia and
hypotropia

Right eye

Elevation, depression
and adduction
limitation

Chronic palsy



CHRONIC RIGHT THIRD NERVE PALSY

FORCED DUCTION TEST

Restriction vs limitation

Planning management

FORCED DUCTION TEST

- VIDEO

FORCED GENERATION TEST

PARESIS VS PALSY

Planning management

FORCED DUCTION & GENERATION TEST

- VIDEO

ANCILLARY TESTS - CONCLUSION

DIPLOPIA
CHARTING

HESS
CHARTING

FDT & FGT

COMPLEX
STRABISMUS



SIMPLE
STRABISMUS

$$\int \frac{[\cos^1 x \{ \sqrt{(1-x^2)} \}]^{-1}}{\log_e \left\{ 1 + \left(\frac{\sin (2x\sqrt{(1-x^2)})}{\pi} \right) \right\}} dx$$

$$1 + 2 = 3$$