Optical instruments

Lectur 11

Maddox Wing

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Maddox Wing

Maddox Wing is an instrument used by ophthalmologists, and optometrists in the measurement of strabismus .It is a quantitative and subjective method of measuring the size of a strabismic deviation by association of the eyes brought about by two septa which are placed in such a way as to present fields to either eye separated by a diaphragm at the centre. The right eye sees a red and white arrow, each of which point to a scale with numbers seen by the left eye; the red arrow points to the vertical red scale and the white arrow points to the horizontal white scale. A third arrow located to the right and below the horizontal white scale is used to measure torsion

Indications

Maddox Wing measures the size of heterophorias (latent deviations) and small heterotropias (manifest deviations) at near when normal retinal correspondence (NRC) is present. It is especially helpful when patients present with symptoms of diplopia (double vision) with no apparent cause. Unsuspected torsional deviations may also be revealed where there are no symptoms present. It is a quick and convenient method of measuring the size of a deviation and is generally used in association with a number of other tests before a full diagnosis is determined.

The Septa:

There are 2 septa that parts the eye piece so that the patient has two separate fields of view.

The Scale Card

Used to measure the deviation of heterophorias, small heterotropias (with NRC) and also torsion. The measure card has the horizontal,

vertical and torsional measures. The board also has the red and white arrows.

The Torsion Lever:

On the measuring board there is an adjustable lever which the patient subjectively aligns to measure torsion.

Method

The Maddox Wing test is performed at near with the instrument held in reading position, slightly inferior (approximately 15° depression and 33 cm away). The room or location of the test should be brightly illuminated and the patient's optical correction (e.g. glasses, bifocals, multifocals, contact lens) is mandatory to be damaged. In the result that correction cannot be worn due to the obstruction of vision through the eye piece, lenses may be placed within the lens holder before each eye. The examiner instructs the patient to hold the Maddox Wing and identify the number that the white (vertical arrow) and red (horizontal arrow) arrows point to on their respective scales.

Recording

Key:

Symbol	**Meaning/Definition**
Δ	Prism Dioptres (i.e. measurement of deviation)
°	Degrees (i.e. measurement of deviation)

-	Exo-deviation
+	Eso-deviation
ɵ	No Vertical Deviation
ϕ	No Horizontal Deviation
cc	With optical correction
sc	Without optical correction

Interpretation

With the maddox wing, you cannot differentiate between a manifest deviation or latent deviation. The white arrow on the white X-Axis measures for horizontal deviations in which, odd numbers represent eso deviations and even numbers represents exo deviations. The red arrow on the red Y-Axis measures for vertical deviations; odd numbers represent right hyper deviations and even numbers represents left hyper deviations. In the absence of a deviated eye, both red and white arrows point to zero, indicating that there is no deviation present. The presence of torsion is determined subjectively; the patient is instructed to take hold of the torsion lever and make it straight.

Advantages

- Time effective method of measuring strabismus
- Measures horizontal, vertical and torsional deviations
- Hand held instrument
- Not a difficult skill to learn and since the numbers can be read only the patient accommodates sufficiently which makes the test much more reliable
- Can be used on children

Disadvantages

- Contraindicated where abnormal retinal correspondence (ARC) or suppression are present
- The dissociative nature of the test may cause irregularities in measurements
- Does not differentiate between latent and manifest strabismus
- Septa is easily determined, may lead to incorrect results as one eye sees both arrows and numbers
- Cannot be performed in the distance