SAWA UNIVERSITY

REFACTIVE ERORRS

جامعة ساوة

كلية التقنيات الصحية والطبية

قسم تقنيات البصريات

الثالة المرحلة

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Astigmatism

Astigmatism occurs when the refractive power of the eye is not the same in all meridians (directions) due to a change in the shape of the lens or cornea's curvature, frequently described as 'rugby ballshaped'. Patients usually are unable to distinguish letters such as 'o' and 'c'. Normal eyes can exhibit diurnal variations in corneal shape, flattest in the morning, as a result of changes in eyelid pressure and muscle tension .

TYPES OF ASTIGMATISM

- Regular astigmatism: The principle meridians, termed steepest and flattest meridians, are 90° from each other. Further classified as:
- With-the-rule astigmatism: Occurs when the vertical meridian (90°) is the steepest. It is corrected with a plus cylinder lens between 60° and 120°.
- Against-the-rule: Occurs when the horizontal meridian (180°) is the steepest. It is corrected with a plus cylinder lens between 150° and 30°.

- Oblique: Occurs when the principle meridians are neither at 90° nor 180°. It is corrected with a plus cylinder lens between 31° and 50° and 121°–149°.
- Irregular astigmatism: Principle meridians are not perpendicular to each other. Occurs in conditions such as keratoconus or corneal ulcers

Etiological classification:

1- Curvature astigmatism: Most commonly, it is corneal, where vertical curvature is more than horizontal curvature (due to pressure of the upper eyelid), less commonly it is lenticular (induced by lens).

2- Decentering astigmatism: subluxation of lens.

3- Index astigmatism: due to cataract in one meridian.

a- Simple astigmatism: myopic or hypermetropic; one of the foci falls on retina, other in front or behind it.
b- Compound astigmatism: neither of the two foci lies upon retina, but are both placed in front or behind retina (myopic or hypermetropic respectively).
c- Mixed astigmatism: one focus in front and other behind retina.

Treatment: - Cylindrical lenses in spectacles: only for simple astigmatism. -toric lens in spectacles: spherocylindrical lens for compound and mixed astigmatism -Contact lenses: of soft, rigid, hard type. - Photorefractive Excimer laser surgery: up to 3D. - LASIK: like photorefractive Excimer laser surgery, UP TO 5D astigmatism. - Phakic Toric IOL up to 6D. Limbal relaxing incision: on the axis of steepest meridian. - Keratoplasty (corneal graft): for more than two meridians and central corneal opacity