Script by slides - Applications of Specialty Contact Lenses - FIACLE Bezalel Schendowich

1. My segment is built around some of our applications of specialty contact lenses

2. In addition to acknowledging the source of the graphics I have borrowed from the NKCF booklet, I feel that the patients who have brought us the problems to help solve deserve mention and that Sha'are Zedek deserves thanks for providing our contact lens clinic in the ophthalmology department a home from which to aid those patients in regaining functional vision

3. In order to give you a frame of reference: I would like to present a brief review of anterior ocular anatomy. When dealing with contact lenses the vast majority of our work has been on the surface of the cornea

4. The cornea is roughly 11.5-12.5 mm in diameter and has a normal center thickness of around 540 microns

5. Corneal lenses range in size from relatively small (8.7 mm and less) to lenses that reach from edge to edge of the cornea

6. Scleral anatomy picture

7. The first contact lenses were scleral lenses and so are our most modern contact lens designs. The first were blown glass; today's are designed by computer and manufactured from highly oxygen permeable materials

8. Scleral firm lenses do not rest on the cornea, and can extend as far as 6mm onto the surface of the white of the eye past the limbal junction. Other advantages of scleral lenses include that they will not fall off of the eye; they will not collect dust or other particles; and, that they will provide a semi-sealed saline bath for fragile corneal tissues. Soft contact lenses are all scleral in size but rest on the cornea

9. Among applications of specialty contact lenses are fitting infants after surgery for congenital cataracts and various primary and secondary causes of corneal irregularity

10. Pediatric patient

11. When a child is born with opaque natural crystalline lenses or develops cataracts soon after birth, the opacity must be removed in order to allow visual information access to neurological pathways. It is important to extract the cataract as early as possible to reduce the potential for developing lazy eye. Eye surgeons must wait until they can properly evaluate and calculate the power for intra-ocular lens implant before they can perform that secondary operation. While waiting, contact lenses remain the most effective tool for compensating for the missing optical component

12. Picture: progressing ectasia – A cornea's surface can change from a smooth, uniform curvature to a shape reminiscent of a squeezed balloon

13. When discussing ectasias, trauma and surface irregularities, we must remember that…The cornea is responsible for 67% of the eye's focusing power. Very small irregularities in corneal surface shape have very meaningful effects on clarity and singleness of vision. The role of contact lenses in the case of corneal irregularity is to replace the damaged or deformed surface with one of more perfect shape

14. The polished surface of the contact lens provides a near perfect refraction and the 20-50 micron thick tear layer effectively negates the irregularities of the cornea

18. While a normal cornea will give evenly spaced and smooth contoured rings, the irregular cornea distorts the rings as in the image on the left. The computer calculates the shape and presents an image in which red represents more curved areas.
19.
20. Another representation of a keratoconic cornea shows gross distortion: Corneal Ectasia, that is, changes in corneal shape, is marked by thinning, steepening, increasing irregular astigmatism and distortion. Vision is marred by blurring, smearing, multi-opia. And, there is a tendency to lopsided progression: one eye before the other which ca result in increasing disparity between eyes. Finally, there is increasing difficulty to sharpen vision with glasses.
21.
22. For diagrammatic purposes identical corneal contact lenses are placed on three corneas demonstrating how progressing ectasia might appear relative to a contact lens surface. The advanced ectasia in the right hand drawing is suffering from an abrasion. Until recently fitting ectasias might have resulted in apical corneal scarring – speeding the eye down the road to corneal graft
23.
24. "Modern Innovations" The goal for fitting irregular corneae today is designing a fitting surface geometry to be either parallel to, or more curved than the corneal surface in order to avoid abrasions

25. R-B and normal fl patters for comparison

26. Another cornea debilitating condition is Reis-Buckler's Dystrophy. In Reis-Buckler's Dystrophy the corneal surface is rough and irregular. The patient suffers from irregular astigmatism; loss of corneal transparency; and, corneal opacities of varying sizes and shapes. These changes can also lead to double vision

27. My patient suffered from degraded and double vision until we moved him to a 15.8 mm mini-scleral design, high oxygen permeable lens

28. Piggy backing article

29. Often best visual acuity can only be had with a firm corneal lens. Often the lens has a less than optimal fitting relationship with the cornea or the cornea has a surface irregularity that inclines toward abrasions. One solution can be found in piggy backing a firm lens on top of a soft contact lens. The technique of piggy-backing contact lenses is based upon floating a firm lens for vision improvement on top of a soft contact lens for comfort and protection. Using two lenses in this way provides protection and comfort especially in dusty environments which otherwise would have been problematic. Piggy backing contact lenses is recommended when there is an irregular corneal surface which can result from post graft or very advanced ectasia. Piggy backing can also provide relief when an eye is extremely sensitive or when the patient must work in a dusty environment

30. Contact lenses can be instrumental in achieving optical and visual restoration after trauma. My patient is a 55 year old who is many years post corneal graft in each eye. He suffered severe damage to his eye after falling off his bicycle. The graft wound was torn open and as a result he lost his iris and his crystalline lens

29. After repairing the wound the patient was left with a severely scarred and irregular cornea. The loss of his iris gave him glare and brightness issues. The loss of his natural lens caused defocus requiring a high plus powered lens correction

30. Anatomy slide showing areas harmed

31. The lens

32. The solution to his problem requires a large diameter soft contact lens for stability. The lens has a painted iris for glare reduction and cosmesis. We designed the lens with power to compensate for most of induced vision correction prescription and the remaining cylinder is corrected in glasses

33. Before/After

34. Thank you