What is a Cataract

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Course Outline

- This lecture is designed to assist technicians on how to identify potential patients with cataracts. Case history and testing procedures will be discussed. You will learn techniques on how to establish a dialog with patients nervous about the procedure, and how to put them at ease about the process. We will also review the different types of cataracts and potential hazards associated with maturing cataracts. We will also discuss the process of cataract extraction and IOL placement. The attendee will also learn about different lens types that are currently available in the market.
Objectives

• Identify the characteristics of a cataract

• Discuss the different types of cataracts

• Identify risk factors involving cataracts

• Discuss the surgical procedure to remove a cataract

• Discuss post-operative observations
What is a Cataract

- A *cataract* is a clouding of the *lens* inside the *eye* which leads to a decrease in vision. It is the most common cause of blindness and is conventionally treated with surgery. Visual loss occurs because *opacification* of the lens obstructs light from passing and being focused on to the *retina* at the back of the eye.[1]
Example

- Camera vs the Eye in a camera, the lens focuses the image on the film just like in the eye the crystalline lens focuses the image on the retina. Anything smudging the lens impacts the image on the film the same as when the crystalline lens becomes filled with protein deposits decreasing visual acuity.
How Cataracts Are Formed

- Most cataracts develop when aging or injury changes the tissue that makes up your eye's lens. Some cataracts are caused by inherited genetic disorders that cause other health problems and increase your risk of cataracts.
• The lens, where cataracts form, is positioned behind the colored part of your eye (iris). The lens focuses light that passes into your eye, producing clear, sharp images on the retina — the light-sensitive membrane on the back inside wall of your eyeball that functions like the film of a camera.
• A cataract scatters the light as it passes through the lens, preventing a sharply defined image from reaching your retina. As a result, your vision becomes blurred.
As you age, the lenses in your eyes become less flexible, less transparent and thicker. Aging-related changes to the lens cause tissues to break down and to clump together, clouding small areas of the lens. As the cataract continues to develop, the clouding becomes denser and involves a greater part of the lens.
Types of Cataracts

- Nuclear
- Cortical
- Sub-Capsular
- Traumatic
- Congenital
- Secondary
Nuclear Sclerosis

- **Cataracts that affect the center of the lens.**
- First cause you to become more nearsighted or even experience a temporary improvement in your reading vision.
- The lens gradually turns more densely yellow and further clouds your vision.
- Nuclear cataracts sometimes cause you to see double or multiple images. As the cataract progresses, the lens may even turn brown.
- Advanced yellowing or browning of the lens can lead to difficulty distinguishing between shades of color.
Cortical Cataracts

• A cortical cataract begins as whitish, wedge-shaped opacities or streaks on the outer edge of the lens cortex.

• As it slowly progresses, the streaks extend to the center and interfere with light passing through the center of the lens.

• Problems with glare are common for people with this type of cataract.
Posterior Subcapsular Cataract

• A posterior subcapsular cataract starts as a small, opaque area that usually forms near the back of the lens, right in the path of light on its way to the retina.

• A subcapsular cataract often interferes with your reading vision, reduces your vision in bright light and causes glare or halos around lights at night.
Traumatic Cataracts

- Cataracts that form after a traumatic injury to the eye. A cataract may form years after the original injury.
Secondary Cataracts

- Cataracts that are caused by another treatment or condition. Diabetes, other metabolic diseases, eye surgery and even some medications can cause the formation of a cataract
Congenital Cataracts

• Some people are born with cataracts or develop them during childhood. Such cataracts may be the result of the mother having contracted an infection during pregnancy.

• They may also be due to certain inherited syndromes, such as Alport's syndrome, Fabry's disease and galactosemia.

• Congenital cataracts, as they're called, don't always affect vision, but if they do they're usually removed soon after detection.
Chief Complaints

- Clouded, blurred or dim vision
- Increasing difficulty with vision at night
- Sensitivity to light and glare
- Seeing "halos" around lights
- Frequent changes in eyeglass or contact lens prescription
- Fading or yellowing of colors
- Double vision in a single eye
Risk Factors

- Increasing age
- Diabetes
- Drinking excessive amounts of alcohol
- Excessive exposure to sunlight
- Exposure to ionizing radiation, such as that used in X-rays and cancer radiation therapy
- Family history of cataracts
- High blood pressure
- Obesity
- Previous eye trauma or inflammation
- Previous eye surgery
- Prolonged use of corticosteroid medications
- Smoking
Cataract Causing Medications

• **Corticosteroids**
  are a common medication used for conditions such as asthma and arthritis

• **Deferoxamine Mesylate**
  a medication used as an iron-chelating agent.
  Iron-chelating agents are used to remove excess iron from the bloodstream

• **Birth Control**
  Combination hormonal contraceptives have the potential to cause side effects including the development of cataracts. However, this side effect is rare, and more studies must be done to determine the level of risks for cataracts when using these birth control products.
Cataract Removal Procedure

- Surgery
- Patient Health
- Phacoemulsification
Surgical Concerns

- Narrow Angles
- Blood thinners
- Excessive Astigmatism
- Flomax – floppy iris
- Super Dense Cataracts
- Undiscovered retinal issues
- Patient expectations
IOL Options

• Standard IOLs
• Premium IOLs
• Multi-focal IOLs
• Accommodative IOLs
Post Operative Observations

- 24 Hour follow up IOP
- Patient compliance
- Corneal Swelling
- Retinal Complications
- FB Sensation
- Dry Eyes
- Eye glasses use/1\textsuperscript{st} vs 2\textsuperscript{nd}
- Photophobia/
  Sunglasses use
Posterior capsule rupture

- The most common intraoperative complication that occurs during cataract surgery is posterior capsule rupture. An extremely thin membrane, called the capsule, holds the natural lens of the eye in place. During cataract surgery, the clouded natural lens of the eye is removed, but the capsule is left in place to hold the new plastic lens implant in the eye in appropriate position. If the capsule is perforated during the surgery, a capsular rupture is said to have occurred. This may allow vitreous jelly from the back of the eye to come forward into the front of the eye through the broken capsular membrane. The surgeon may then need to perform an anterior vitrectomy, in which the prolapsed vitreous is removed from the front part of the eye.
Retained lens fragment

• When a capsular rupture occurs, sometimes parts of the cataract fall into the back part of the eye. This complication is called retained lens fragment. Most cataract surgeons will typically handle these cases as they would a capsular rupture alone, removing prolapsed vitreous jelly from the front of the eye then placing an lens implant into the eye. Typically, after the surgery, then, a patient will be referred to a vitreoretinal surgeon for evaluation. If the lens fragment retained in the back part of the eye is large enough, the vitreoretinal surgeon may recommend a
Bleeding

Severe bleeding inside or around the eye, which is called hemorrhage, is very rare during routine cataract surgery. The surgery usually has to be stopped and the patient typically watched for several weeks while the blood reabsorbs. Occasionally, as second surgery, such as a pars plana vitrectomy, is needed to help remove blood from the eye after this complication occurs. Historically, there was some concern by eye surgeons that patients taking blood thinners or aspirin may have been at more risk for this complication.
Corneal swelling

- The most common postoperative complication after cataract surgery is swelling of the cornea, which is called corneal edema. Most corneal swelling resolves within a few days or weeks after the cataract surgery, and the vision gradually becomes more clear. Sometimes, corneal edema can persist for many months after the surgery. This may be the case if the cornea had a pre-existing condition called Fuchs dystrophy, or if the cataract was extremely dense and difficult to remove. In cases where the corneal swelling does not resolve, and additional surgery may be required where a partial corneal transplant is performed to replace the inside lining cells of the cornea.
High intraocular pressure

- Another relatively common postoperative complication is high intraocular pressure. During cataract surgery, the surgeon uses special surgical gels, called viscoelastics, to help protect important structures of the eye during the surgery. Occasionally, small quantities of these gels are retained in the eye after the surgery. When this occurs, the drainage system of the eye can become clogged, causing the eye pressure to rise dramatically. Treatment with pressure lowering eyedrops can typically resolve this problem, though sometimes a small amount of fluid will be released from the eye by the surgeon to help quickly lower the eye pressure. High eye pressure problems such as this usually resolve in the first several days after surgery, unless there are other underlying eye pressure problems to blame, such as glaucoma, which may require more extended treatment.
Endophthalmitis

- In less than 1 in 1000 cases of cataract surgery, a severe bacterial infection of the eye can occur in the first few days or weeks after the surgery is performed. This infection is called endophthalmitis. If not addressed quickly, it can cause loss of vision or rarely, even loss of the eye. Cataract surgery patients typically receive very powerful antibiotic drops in the first week or two after the surgery to help guard against severe infections postoperatively. If endophthalmitis does occur, additional antibiotics are usually injected into the eye to help clear the infection.
Floaters

- New floaters can occur after cataract surgery due to a condition called posterior **vitreous detachement**. The back part of the eye is filled with a jelly called the **vitreous** humor. When a person is young, the jelly is attached to the back wall of the eye. As an individual ages, this jelly becomes more liquid and can start to become detached from the back wall of the eye. During this process, “floaters” can develop as small bits of the vitrous jelly float around the eye more than they previously did. Cataract surgery can sometimes accelerate this process of posterior **vitreous** detachment, and thus, more floaters can be seen after cataract surgery. Also, floaters that were already present in the eye are often more visible after the cloudy cataract is removed from the eye. Floaters typically improve with time, though it can take weeks or months for them to become less noticeable. Rarely, a sudden shower of new floaters can herald a small tear in the **retina** or early retinal detachemt.
Retinal detachment:

- Retinal detachment is a rare complication after cataract surgery. During cataract surgery, pressure changes in the eye can sometimes result in small tears occurring in the edge of the retina. Sometimes new floaters or flashes of light are seen as a symptom of a retinal tear occurring. If the retinal tear progresses, a retinal detachment can occur, in which the retina peels off the inside wall the eye like poorly attached wallpaper. Retinal detachment can cause loss of vision, and typical surgical repair is required to resolve the condition.
Retinal swelling

- Swelling of the retina, called macular edema, can sometimes occur after cataract surgery. The surgical process causes inflammation inside of the eye. The steroid and anti-inflammatory drops prescribed after cataract surgery usually help this inflammation to resolve without problems. However, the portion of the retina responsible for central vision, the macula, sometimes can become swollen after cataract surgery due to intraocular inflammation. Eyedrops can typically be prescribed that over the course of several weeks help resolve macular edema, though sometimes injections of steroids or surgery are needed to help improve the condition.
Posterior Capsule Opacification

- A relatively common complication of cataract surgery is clouding of the posterior capsule, the fine membrane that sits behind the newly implanted prosthetic lens. This clouding can occur months or even years after the cataract surgery. The condition is easily fixed with a laser procedure called **YAG capsulotomy**, in which a laser is used to painlessly open a hole in the posterior capsule, clearing the vision.
Under Promise – Over Deliver

• Wanting 20 y/o vision
• My neighbor or a relative have the sx and know they don’t wear glasses
• No IOL can guarantee 20/20 vision 100% of the time
• Outcomes vary
Review

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Thank you

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