Strabismus

Patient Information Brochure

Q: How do eyes work?

A: The two eyes are coordinated by a central area in the brain and move together in a way that is similar to the front wheels of a car. One wheel cannot be moved without the other one moving. Likewise, you cannot move your left eye independently of the right eye. If one of your car wheels is bent inward, you can, by turning the steering wheel, make it straight. However, the previously straight wheel will now be turned in. The same concept of movement applies to the eyes. Thus, while it may appear that the right or the left eye is misaligned, it is really a problem between the two eyes. An eye muscle problem may be corrected by operating on either eye or, more commonly, on both eyes.

Fig 1. Like the steering wheel controls the front wheels of a car, the brain coordinates normal eye movement

Q: What is strabismus (squint)?

A: Strabismus is the medical term for misalignment of the eyes. It is a Latin word meaning “to look askance or sideways.” It refers to the problem of the eyes not working together and one eye turning in, out, up or down. Approximately four percent of children in India are affected by strabismus. There are various reasons for this condition, ranging from a need for glasses to ocular (eye) or neurological abnormalities. A parent or close relative is often the first to notice a vision problem. When a vision problem is suspected, a complete eye examination should be arranged as soon as possible. Early detection and management are important for best results.

Fig 2. Child with strabismus

Q: How is strabismus managed?

A: We assess visual acuity in infants and children, measure ocular deviations, and evaluate eye movements. The level of the examination will be adapted to your child's ability to respond. We obtain much useful information through observation of your child's visual behavior. Although responses are helpful, verbal ability is not necessary to complete an accurate eye examination.

Q: Will glasses help my child?

A: Some children have an inward turning eye (crossed eye) that is due strictly to farsightedness (accommodative esotropia). They must use extra focusing power to see clearly. Without glasses, one or both eyes turn in. Corrective lenses relax this extra focusing power so that the eyes stay straight. Glasses with or without bifocals are the best solution.

Children who have an occasional outward drift of one eye when tired may benefit from glasses with 'minus' power that help them to keep their eyes straight.

Glasses may be needed to provide clear vision and eliminate blurring, squinting, or abnormal head positions.

Fig 3. Patient before and after glasses

Q: Does a turned eye cause double vision?

A: When a child's eyes do not work together as a team, he/she will look at an object with one eye while the other eye looks at something else. The image from the wandering eye causes double vision. But the brain, by a technique called suppression, switches off the wandering eye. Thus, younger children rarely have double vision.

Older children and adults with newly acquired eye muscle problems often report double vision. Sometimes double vision may be treated with the use of prisms that adhere to or are incorporated into a pair of glasses.

Q: Will eye exercises help?

A: Eyestrain and fatigue when reading may indicate a convergence problem. Measurements by us can determine if your child will benefit from eye exercises. Simple near-point exercises can be done even with young children.

Q: What can happen if I leave the squint untreated?

A: When a young child uses one eye predominately and does not alternate between the two eyes, the prolonged suppression of the nondominant eye by the brain may develop into amblyopia. Amblyopia is sometimes referred to as “lazy eye,” but it is more than just an eye problem. The visual portion of the brain is suppressed and vision actually decreases in the unused eye.

So an untreated squint can cause amblyopia and vice versa. Normally amblyopia associated with squint require hand in hand treatment of both squint and amblyopia.

Refer to our amblyopia brochure for further detail.

Q: I don’t have squint all the time. I have it occasionally. Do I need treatment?

A: This type of squint is called Intermittent Squint. It generally occurs at the end of the day, when you are tired or when you fall sick.

They are normally outward deviations (one eye going out). And this squint is common in adults who have been having it since childhood. Because it is intermittent, they have ignored it. It also leads to chronic eye strain due to the effort required to keep the eyes straight.

This type of squint may be partly managed with glasses and eye exercises. However in most cases, a time comes when the control of squint becomes poor and it starts occurring more frequently and may become permanent.

Surgical intervention is recommended when the control becomes poor and squinting becomes frequent.

Q: What is strabismus surgery?

A: Many patients with eye deviations will eventually need an operation to align the eyes. The goals of surgery are twofold. The first is to change the present eye alignment in such a way as to enable the brain to use both eyes together. This may reestablish binocular function. The second is to improve the appearance so that the eyes look straight and move together. The chances for achieving these goals are infl uenced by the size and complexity of the eye deviation, the age of onset, types of previous treatment, quality of binocular function (depth perception), and the compliance with pre- and post-operative therapy.

The results of strabismus surgery are not always perfect because human tissue varies from individual to individual. Therefore, it may take more than one operation to achieve the goal of straight eyes. The success rate varies from 50 to 90 percent, depending on the type of operation and condition of the eyes. In some cases the surgery may be performed in steps, with the first operation designed to correct only part of the problem. A second or even third operation may be necessary to deal with any residual misalignment or to correct another

aspect of the problem. Sometimes the correction of one problem will uncover a second problem that was not apparent before the surgery.

The purpose of this discussion is to acquaint you with the facts about strabismus surgery. With vigorous and complete treatment the results are usually extremely gratifying.

Q: How the eye muscles work?

A: Eye muscle surgery involves either weakening or strengthening the muscles that control eye movement. There are six muscles that attach to the outside surface of the eyeball and control the movement of each eye. Four of these muscles are called rectus muscles and their functions are very straightforward. The superior rectus muscle attaches to the top of the eye and pulls the eye up. The inferior rectus muscle attaches to the bottom part of the eye and pulls the eye down. The medial rectus muscle attaches to the side of the eye closest to the nose and pulls the eye in. The lateral rectus muscle attaches to the outside of the eye closest to the ear and pulls the eye out.

Two additional muscles (the oblique muscles) have very complex eye movement functions. The superior oblique muscle attaches to the top back part of the eye and runs through a pulley near the top part of the nose. This muscle pulls the eye down when the eye is looking toward the nose. The inferior oblique muscle attaches to the bottom back part of the eye and pulls the eye up when it is looking toward the nose. Their primary function is torsion, the inward and outward rotational balance of each eye.

Q: What are the surgical procedures?

A: Strabismus surgery consists of two general types of operations. One is a weakening procedure of the muscle which is called a recession, and the other is a strengthening procedure which is called a resection. The technique for doing these operations is as follows: the eye muscle is reached through a small cut through the conjunctiva, which is a thin whitish skin over the surface of the eyeball. The conjunctiva is the part of the eye that gets red and bloodshot when the eyes are irritated. The eye muscles are immediately beneath this conjunctival tissue. Incisions through the skin of the face or the eyelids are not necessary to reach the eye muscles.

A common misconception is that the eye is removed from its bony cradle called the orbit and placed on the face during the operation. This is not true. The eye muscles are located approximately 1/4 of an inch from where the clear dome (called the cornea) meets the white tissue of the eye (called the sclera or conjunctiva). Therefore, it is not diffi cult to get to the eye muscles while the eye remains in its usual position.

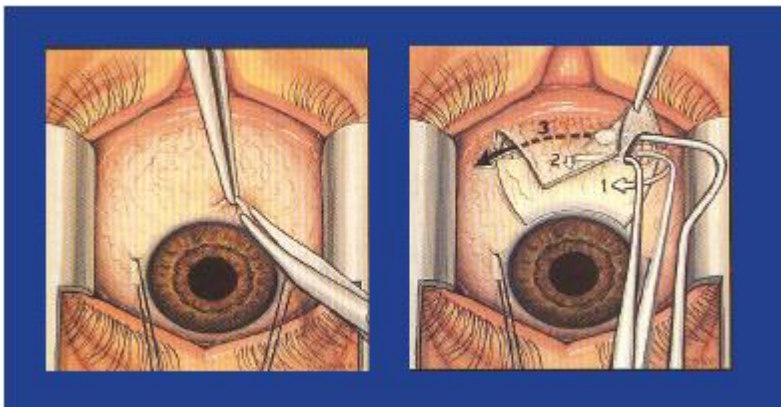

Fig 4a. Squint surgery

Stitches used during surgery are later absorbed. There are no stitches that have to be removed at a later date. The distance that the muscles will be moved is normally determined before the surgery. The technique takes a great deal of skill to move the muscles correctly and is best performed by a doctor who specializes in this type of surgery. The time estimated for the actual surgery is about 20 minutes per muscle. It does not include the time necessary for falling asleep and waking up.

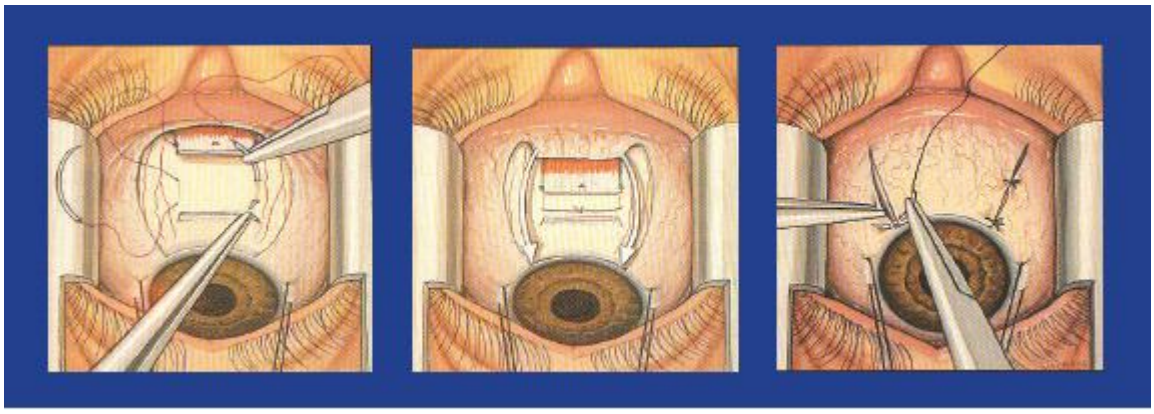

Fig 4b. Squint surgery

Q: Will the surgery be painful? What about anesthesia?

A: One of the risks of strabismus surgery is undergoing anesthesia. With today's techniques and equipment, this risk is extremely small. The risk of a serious complication in a healthy child is approximately 1 in 500,000. It is safer in the operating room having a strabismus operation than it is riding in a car on a four-lane highway.

Every effort is made to ensure that the patient is in the best physical condition before he/she undergoes anesthesia. Prior to surgery you may be asked to obtain certain blood tests and X-rays as necessary.

The anesthetic concerns for strabismus surgery are different from most other types of surgery. Most patients are healthy, the operation is usually short, and major body systems are not involved. Potential anesthetic problems are minimized.

The surgery is most often done as an outpatient procedure. This reflects the relative safety and ease of recovery from general anesthesia used for eye surgery. Since eye surgery is

“elective,” any condition that would increase the risk of complications from anesthesia must be eliminated prior to surgery. This is especially important in children. Conditions such as ear ache, pneumonia, flu-like symptoms, or GI problems will result in postponement of the surgery until they have been treated. It is safer to delay the surgery than to operate on a child or an adult who is sick.

Q: What are the complications of surgery?

A: During surgery every effort is made to reduce the likelihood of problems. However, during the course of any surgical procedure problems may arise. It is the surgeon’s responsibility to minimize these problems in the operating room. After the surgery, it is the patient’s (or parent’s) responsibility to follow carefully the instructions and treatment prescribed. The most frequently encountered complications are as follows:

1. Overcorrection/undercorrection: This is not really a complication but is instead an undesirable outcome. Overcorrection or undercorrection of a misalignment may occur in the eyes being repaired. An overcorrection would be to make an eye turn out that previously turned in. An undercorrection would be an improvement in the alignment of the eyes but the eyes are still turned in. This failure to achieve optimal alignment occurs anywhere from 20–40 percent of the time and may result in the need for the use of glasses, special eye drops, prisms, or an additional surgical procedure.

2. Infection: Infection may occur in the immediate post-operative period, but fortunately this is extremely rare. The ocular tissues are highly vascular and this usually aids in the prevention of this problem. You will be given instructions with regard to the use of antibiotics and in the care and use of the eyes in the immediate post-operative period. A post-operative visit will be scheduled to detect any early signs of an infection. Severe infection inside the eyes can result in loss of vision. Fortunately, this is very unusual after strabismus surgery.

3. Bleeding/Retinal detachment: A small bleed into the eye may occur which normally resolves without intervention. Rarely (approximately one out of 10,000) a retinal detachment can result which will require further surgery to repair.

4. Slipped muscle: The suture used to attach the eye muscle to the eye is extremely strong. However, in a rare situation the suture may break, which can cause the muscle to slip or become detached from the globe. This requires immediate surgery to reattach the muscle. Fortunately, this also rarely happens.

5. Loss of vision: Permanent loss of vision from eye muscle surgery occurs approximately in one out of 10,000 eye muscle operations, or less. The cause is usually internal eye infection (endophthalmitis), internal eye hemorrhage, or retinal detachment. Early detection and treatment can save vision.

6. Double vision: In the immediate post-operative period it is not unusual for the patient to see double (called diplopia). The eye muscles are sore and are not working correctly, or occasionally the eye position has been changed enough so that the brain processes two images instead of one. The double vision normally resolves within days to weeks, and in

some cases it is desirable immediately after the surgery. Persistent double vision, however, may require additional intervention if it does not resolve in an appropriate period of time. Every effort is made to try to anticipate whether this will occur so that you or your child can be prepared in the immediate post-operative period.

7. Change in refraction: Changes in eyeglass prescriptions may be necessary after eye muscle surgery due to slight alterations in the shape of the eye or cornea. This may not be permanent and new glasses will usually correct any refractive changes.

Q: What is the post-operative care?

A: Instructions for post-operative care will be given at the time of the surgery. Eyes vary in appearance and comfort depending on the type of operation and how much surgery was done. You can expect the eyes to be somewhat sore and irritated for at least several weeks after the operation. The conjunctiva will be red and swollen, and it may feel like you have sand or other foreign objects in the eye. Sometimes the upper and/or lower lids will retain fluid and swell. This usually resolves within several days. If both eyes are operated on, neither eye will be patched. If, however, just one eye is operated on, a patch will often be used to increase comfort.

It is recommended that most people remain out of work or school for a few days to one week following the surgery. While you may be able to resume your activities within a day or two, it is better to plan for a longer recovery period in case it is needed.

The two basic rules that should guide activities for the first week after surgery are:

1. Nothing gets in the eye(s)—including rubbing eye(s) with your hands

2. Avoid any possible injury to the eye(s)

If you apply these two rules to the planned activity and neither is an issue, then the activity is okay. Otherwise, DON'T DO IT! Questions about additional issues not covered here may arise. Please feel free to contact your doctor prior to surgery in order to get these questions answered.