

DEPARTMENT OF
OPHTHALMOLOGY

Eye Muscle (Strabismus/Squint) Surgery



You have been given this leaflet because your ophthalmologist (eye doctor) has recommended eye muscle (strabismus/ squint) surgery. This information booklet explains what the surgery involves, the risks and benefits of the operation, and how to care for your eyes after surgery.

UNDERSTANDING EYE MUSCLE SURGERY

What is Eye Muscle Surgery?

Eye muscle surgery (known also as strabismus or squint surgery) is a surgical procedure that changes the alignment (position) of the eyes. This is done by weakening and/ or strengthening specific eye muscles.

Why do I need Eye Muscle Surgery?

You have been advised to undergo eye muscle surgery. The indications for eye muscle surgery are:

- Misalignment of the eyes
- Problems with depth perception
- Abnormal head position
- Double vision
- Eye strain
- Difficulty communicating with others
- Others: _____

The aim of eye muscle surgery is to lessen or eliminate one or more of the above problems. There is a 60 – 85% probability of improvement, depending on multiple factors, including but not limited to the nature and complexity of the strabismus, previous eye muscle surgeries, presence of amblyopia (lazy eye) and fusion potential (the ability to use both eyes together).

What are the options?

Alternatives to eye muscle surgery include doing nothing, prescription glasses, prism glasses, special filters, patching, botulinum toxin (botox) injection and eye muscle exercises. Your ophthalmologist will discuss these options with you.

What will happen if I do not undergo the procedure?

Your condition and problems as stated above are likely to persist if surgery is not performed. In a child with a poorly controlled or constant misalignment, the brain can shut off (suppress) either eye, leading to poor depth perception, loss of fusion (the ability to use both eyes together) and visual deterioration (amblyopia). In some situations prompt eye muscle surgery is needed to restore depth perception, fusion and vision.

In other situations, such as where surgery is indicated to correct the position of the eyes to enable better communication with others, surgery can be deferred without affecting vision. Your ophthalmologist will discuss this further with you, as well as suitable alternatives to surgery, if any.

How is Eye Muscle Surgery performed?

After anaesthesia has been administered, the eyelids are gently held open with a small instrument called an eyelid speculum. A small incision (opening) is made in the conjunctiva, which is the thin clear covering of the white part of the eye, overlying the eye muscle. Through this opening, the eye muscle is located with a delicate hook. The eye muscle is separated from the eyeball, and weakened or strengthened. Weakening is achieved by changing the insertion position of the muscle where it attaches to the eyeball. Strengthening is achieved by shortening the length of the muscle. The eye muscle is then reattached to the eyeball using absorbable stitches that will dissolve with time. There is no need to remove the stitches mechanically. Sometimes permanent stitches may also be used. The overlying conjunctiva incision usually does not require stitching. Steroid-antibiotic combination eye drops or ointment is instilled at the end of surgery. No incision is made on the face or skin. The eyeball is not removed from the socket during the procedure.

Adjustable sutures: Standard eye muscle surgery (non-adjustable) uses a permanent knot to secure the eye muscle to the eyeball. Adjustable eye muscle surgery can be done in cooperative adults and sometimes teenagers. Adjustable eye muscle surgery involves placing an adjustable slip-knot at the time of surgery. After surgery, the alignment (position) of the eyes may be fine-tuned by adjusting the stitches that remain attached to the repositioned muscle. Once the desired alignment is achieved, the stitches are tied and trimmed. Adjustment is usually performed a few hours after surgery when the patient is fully awake. Numbing eye drops are used to minimise discomfort during this procedure. A pressure, pulling or aching sensation may be felt in the eye as the muscle position is adjusted. In young children, adjustments are made using brief intravenous anaesthesia in the recovery room.

What are the risks and complications of the surgery?

The following list is **NOT EXHAUSTIVE**, but mentions the more important complications.

Risks related to eye muscle surgery:

- **Undercorrection/ overcorrection:** This can happen in spite of careful pre-operative surgical measurements, the use of standard surgical dosage tables and adjustable sutures, especially in patients with poor fusion potential, amblyopia (lazy eye), previous eye muscle surgeries and complex strabismus. If significant, this can be managed with prism glasses, eye muscle exercises and further surgery.
- **Double vision:** This is usually temporary as the brain adjusts to the new position of the eyes. In some patients with more complex conditions, double vision may persist in side and eccentric gazes. Sometimes patching, prism glasses or further surgery may be needed to treat the double vision.
- **Change in glasses prescription:** The refraction (power) of the eyes can change after eye muscle surgery. If necessary, a new pair of glasses can be prescribed 6 – 10 weeks after surgery when recovery and healing is complete.
- **Reaction to sutures:** Allergic or inflammatory reactions to the stitches can occur, causing eye itch, redness, discomfort and tearing. This usually responds well to eye drops or eye ointment, and may rarely necessitate removal of the stitches. Rarely a lump or blister may grow over the surgery site and need excision.
- **Eyelid retraction or ptosis:** A change in your eyelid position can occur if surgery is performed on multiple muscles, vertical muscles and if a large amount of surgery is performed. This can be addressed with eyelid surgery if significant.
- **Slipped or lost muscle:** The stitch used to secure the eye muscle to the eyeball is very strong. In rare situations, the stitch may break, causing the muscle to slip or detach from the eyeball. This requires prompt reoperation to reattach the muscle. Fortunately this very rarely happens.
- **Anterior segment ischemia:** This happens when the blood supply to the front of the eye is reduced as a result of simultaneous surgery on multiple rectus eye muscles in one eye. Patients with poor blood flow due to medical conditions are also at a higher risk. In general we try to avoid performing simultaneous surgery on multiple rectus eye muscles. We also employ special surgical techniques to preserve the blood supply when needed.

- **Scleral perforation:** Rarely, the needle used to sew the muscle to the surface of the eyeball, can cut the thin white coat of the eyeball and enter the eye (0.1 – 1%). This usually results in a scar that seldom affects the vision. Very rarely, bleeding inside the eyeball, retinal detachment and infection can follow and potentially lead to visual loss. Patients who have high degrees of myopia, thin sclerae and previous eye muscle surgeries with significant scarring have a higher risk. Nevertheless, with today's modern needles and careful technique, this is an extremely rare occurrence.
- **Bleeding:** Superficial bleeding on the surface of the eye is common and usually clears within a few weeks. Major bleeding within the eye socket and in the eyeball during surgery and in the initial recovery period is exceedingly rare, but may affect vision permanently.
- **Infection:** Infection should be suspected if there is increasing eyelid swelling, eye redness, eye pain or greenish or yellow discharge from the eye in the initial period after surgery. Fortunately, this is extremely rare due to the good blood supply to the eye and socket. Infection inside the eye can potentially result in loss of vision. Antibiotic eye drops or ointment will be prescribed after surgery to prevent this occurrence.

Risks related to anaesthesia:

- **Post-operative nausea and vomiting:** You may experience this after surgery, especially if you have a previous history of nausea and vomiting after anaesthesia. In general, this is reduced with the use of anti-vomiting medications given during surgery.
- **Strokes and heart attacks:** here are low risks of strokes or heart attacks occurring at times of stress and anxiety, such as during surgeries. These risks are increased if you have uncontrolled medical conditions. The pre-operative tests will assess your suitability for surgery, and reduce the risk of such complications.
- **Death:** General anesthesia may be associated with mortality, although this is rare. You should consult your anaesthetist if you have specific medical conditions that may increase the risk of your particular anaesthetic.

WHAT DO I NEED TO DO BEFORE THE SURGERY?

Tests before surgery

Pre-operative examination: Your ophthalmologist may schedule a pre-operative eye examination 1 – 2 weeks before surgery, so that he/ she can check your eyes again before the upcoming surgery. Pre-operative photographs and measurements may be taken at this visit. You can discuss any further questions or concerns regarding the procedure with your ophthalmologist during this time.

Pre-operative tests: Depending on your age and health, pre-operative tests such as a blood pressure check, blood test, electrocardiogram (ECG) and chest X-ray (CXR) may be necessary to determine if you are fit for surgery. In general, healthy children need only undergo a routine physical examination without the need for pre-operative tests.

Medications and fasting: If you are taking any blood-thinning and/ or anti-clotting medications such as aspirin or warfarin, you may be asked to stop these medications prior to surgery. Specific instructions on what and when to eat or drink on the day before surgery will be given to you. It is **IMPORTANT** to follow these instructions **STRICTLY**, as surgery may be cancelled if these instructions are disregarded.

Illness: If you or your child becomes sick before the day of surgery, your surgery may need to be rescheduled. It is usually safe to proceed with surgery 2 weeks after the symptoms of an illness have subsided, although each patient's condition will be assessed individually.

WHAT CAN I EXPECT ON THE DAY OF SURGERY

Before surgery: Do remember to follow specific fasting instructions given to you.

Anaesthesia: Eye muscle surgery is usually performed under general anaesthesia in children and adults. Adults also have the option of having surgery under local anaesthesia with sedation. Children may be accompanied to the operating theatre by one parent, until the child is asleep. Young children are put to sleep by breathing gas from a mask held close to the child's face. An intravenous (IV) line and a breathing tube are placed after the child falls asleep. Older children and adults will have an IV line placed beforehand so that medications can be delivered to put them to sleep. Adults who chose to have local anaesthesia will also have an IV line placed so that medications for sedation can be delivered.

Surgery: Most eye muscle operations take about 20 minutes per muscle, but the operating time can vary, depending on the complexity of the procedure, the number of muscles that are to be operated on, and whether there has been previous eye muscle or eye surgery.

After surgery: The operated eye(s) may be patched after surgery, especially if an adjustable suture has been used. The eye patches will be removed before discharge. Ice packs may also be placed over the operated eye(s) to help reduce post-operative swelling and discomfort. You will be monitored in the recovery area before being discharged. A light snack may be served. You will be given eyedrops or eye ointment to use in the operated eye(s) after surgery. Specific instructions on how to care for your eyes after surgery will be provided. Please arrange for a responsible adult to accompany you home.

EYE MUSCLE SURGERY POST-OPERATIVE INSTRUCTIONS

This section provides key information for after-care in patients who have undergone squint surgery. Taking these precautions may help to reduce risks and complications.

The time frames stated are rough guides, and may differ from patient to patient. Always clarify any doubts with your doctor.

IMMEDIATELY AFTER SURGERY

There may be some eye discomfort, eye redness and mild eyelid swelling. A cold compress or ice pack will be placed on the operated eye. The ward nurse will clean the eye and instill eye drops or eye ointment for you. She will show you and your care-givers how to instill the eye medications and advise you on eye care.

If you had eye muscle surgery with adjustable sutures

There will be adjustable sutures (stitches) in your eye, which can cause mild eye discomfort. Resist the urge to rub your eyes as this can pull on the sutures. The ward nurse will bring you to the eye clinic for post-operative adjustment of your eye position a few hours after your surgery, when you are fully alert. Once the desired position is achieved, the sutures are tied and secured. Eye discomfort is minimised.

When can I go home?

You will usually be able to return home on the day of surgery, once you are fully alert and your post-operative condition is stable.

THE FIRST FEW DAYS AFTER SURGERY

What to Expect

- Blood-stained tears initially, which should quickly subside.
- Some eye discomfort and mild pain, settling over 1 – 2 weeks. Oral pain-killers can be taken as needed.
- Some eye redness and eyelid swelling is expected, subsiding over 2 – 3 weeks.
- Vision may be blurred or double initially. This will steadily improve over 2 – 4 weeks.
- Clinic visits: One visit the very next day, then once or twice in the next few weeks.

What I Must Do/ What is Safe to Do

- Start all medications as prescribed.
- Apply the eye drops/ ointment as instructed. Refer to the section on "Eye drop/ointment medications".
- Clean your eyes as instructed twice daily with moistened sterile/clean cotton balls. Cotton balls can be moistened with sterile saline or cool boiled water.
- Apply cold compress (first 3 days) to reduce swelling and discomfort. You can put crushed ice or ice-cold water into plastic zip "baggies", and then place it over a washcloth or clean gauze draped lengthwise across the operated eyes. Alternatively you can use frozen peas in plastic bags (available in supermarkets) instead of ice. Do not use commercially available ice packs, which may be too heavy. Apply the cold compresses for about 10 – 20 minutes every hour or so.
- Sleep with your head mildly elevated (first 3 days) to minimise bruising and swelling.
- Rest at home for the first 3 days.
- The following activities are safe: reading, computer work and watching television as tolerated.
- There is no dietary restriction. Take plenty of fruits and vegetables to avoid constipation.

ABOUT 2 WEEKS AFTER SURGERY

What to Expect

- Eye discomfort should be less.
- Blurred and double vision getting better; vision more stable.
- Your squint specialist will gradually tail down your eyedrops over the next few weeks.

What I Must Do/ What is Safe to Do

- You can resume most other activities once you feel up to it.
- As above.

ABOUT 4-6 WEEKS AFTER SURGERY

What to Expect

- Your eye should feel more comfortable.
- There may be removal of sutures (stitches) in some cases.
- New glasses may be prescribed 6-10 weeks after surgery if necessary.
- Your squint specialist will gradually tail off your eye drops.

What I Must Do/ What is Safe to Do

- Light exercise like walking is allowed.

WHAT TO AVOID

- Avoid crowded and dusty places (first 1 week).
- Coughing or sneezing too hard (2 weeks).
- Work (usually 2 – 4 weeks hospitalisation leave is given).
- Strenuous physical activities, e.g. jogging, tai-chi, badminton (for 4 weeks).
- Carrying children who may accidentally poke your eye (4 weeks).
- Lifting heavy objects or bending over at the waist (4 weeks); if necessary, when picking up something from the floor, do it with a straight back and take care not to knock the head while standing up.
- Rubbing/placing pressure on the eye or closing it too tightly (4 weeks).
- Water/soap entering the eyes (4 weeks). If this occurs, wash it out by instilling the eye drops prescribed.
- Swimming and hot tubs (4 weeks).
- Driving or riding a bike (subject to your doctor's advice).

MEDICATIONS

- Eye drops and all medications to be taken as prescribed (refer to the section on "Eye drop/ointment medications").
- Most other oral medications can be continued upon returning home.
- However, please note that **aspirin, anticoagulants and other antiplatelets** can be continued only after consulting your surgeon.

EYE DROP/OINTMENT MEDICATIONS

Eye drop treatment



1 Wash your hands before applying eye drops/touching the eye.



2 Use cool, boiled water or sterile saline to gently clean the eyelids whenever the eye feels sticky) with a sterile cotton ball.



3 Shake the bottle and remove the cap.



4 Hold the bottle close to the eye without touching the eyelid or eyelashes.

Tilt your head back, look upwards and pull the lower eyelid down.

Instill one drop into the eye.



5 Close the eye.

Do not rub the eye.

Gently dab off any excess eye drops.

Eye ointment application



1 Remove the cap from the tube of ointment.



2 Hold the tube close to the eye without touching the eyelid or eyelashes.

Tilt your head back, look upwards and pull the lower eyelid down.

Squeeze a 1 cm ribbon of ointment into the eye and close the eye.

Do not rub the eye. Gently dab off any excess ointment.

IN ALL CASES

- Keep eye drops in a cool place.
- Discard the eye drops one month after opening or upon their expiry date.
- If more than one type of eye drops are to be applied to the same eye, wait **3 – 5 minutes** before instilling the next eye drop.
- Always instill eye drops before eye ointment.

WHAT TO DO IN AN EMERGENCY?

Please call us at Tel: 8126 3632 during office hours if you experience the following:

- **Significant pain, redness or blurring of vision**
- **Severe swelling or excessive discharge** from the eye

Office hours:

- Monday – Friday: 8am – 5pm
- Saturday: 8am – 12noon

*Closed on Sundays and Public Holidays.

After office hours, you are advised to seek treatment at the Emergency Department (A&E), Basement 1, Tan Tock Seng Hospital.

Clinic Appointments and Eye Screening

Subsidised: (65) 6357 7000

Private: (65) 6357 8000

Email: eye@ttsh.com.sg

Website: www.ttsh.com.sg/eye

LASIK Enquiries

Tel: (65) 6357 2255

Email: lasik@ttsh.com.sg

Website: www.ttshlasik.com.sg



Disclaimer

This is a general guide. If in doubt, please consult your doctor. Information is subject to revision without notice. The contents of this leaflet are not to be reproduced in any form without the prior permission of NHG Eye Institute.