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Performing a tarsorrhaphy

What is tarsorrhaphy?
Tarsorrhaphy is the joining of part or all of the upper and lower eyelids so as to partially or completely close the eye. Temporary tarsorrhaphies are used to help the cornea heal or to protect the cornea during a short period of exposure or disease. Permanent tarsorrhaphies are used to permanently protect the cornea from a long-term risk of damage. A permanent tarsorrhaphy usually only closes the lateral (outer) eyelids, so that the patient can still see through the central opening and the eye can still be examined.

What are the indications for tarsorrhaphy?
To protect the cornea in the case of:
- inadequate eyelid closure, for example due to facial nerve palsy or cicatrional (scarring) damage to the eyelids caused by a chemical or burns injury
- an anaesthetic (neuropathic) cornea that is at risk of damage and infection
- marked protrusion of the eye (proptosis) causing a risk of corneal exposure
- poor or infrequent blinking, for example in patients in intensive care or with severe brain injuries.

To promote healing of the cornea in patients with:
- an infected corneal ulcer, which is taking a long time to heal
- non-healing epithelial abrasions.

Other indications include:
- To prevent conjunctival swelling (chemosis) and exposure after ocular surgery
- To retain a conformer or other device, for example in children with anophthalmia or adults after evisceration or enucleation.

What are the different types of tarsorrhaphy?
The techniques for joining part or all of the upper and lower lids can be divided into short-term (temporary) and long-term (permanent) tarsorrhaphies. In both cases the procedure almost always involves using a suture to join the lids. Other techniques that are occasionally used are botulinum toxin tarsorrhaphy (the upper lid levator muscle is paralysed with the toxin), or the use of cyanoacrylate glue to join the lids and placing a weight (usually gold) in the upper lid.

We will describe two simple procedures:

1. A temporary central tarsorrhaphy with a drawstring that allows it to be repeatedly opened and closed for examining the eye.
2. A permanent lateral tarsorrhaphy that leaves the central lids open, allowing the patient to see and the eye to be examined.

The drawstring temporary central tarsorrhaphy (Figures 1a and 1b)
This simple suture tarsorrhaphy will be effective for 2–8 weeks.

1. Anaesthetise the central area of both the upper and lower eyelids with an injection of a few millilitres of local anaesthetic (e.g. lidocaine 1–2% or bupivacaine 0.5%). If anaesthetic with adrenaline is available it will reduce operative bleeding.
2. Clean the area with 5% povidone iodine. Leave the iodine for a few minutes.
3. Pass a double-armed non-absorbable suture (e.g. silk, prolene or nylon 4-0, 5-0 or 6-0) straight through one of the 2 cm bolsters, 2 mm from the end.
4. Line up the bolster in the middle of the upper lid and pass the same needle into the upper eyelid skin 3–4 mm above the lid margin, through the tarsal plate and out of the grey line of the lid margin. The grey line is the slightly darker line in the middle of the lid margin that is between the anterior and posterior lamellae of the lid.
5. Pass the same needle into the grey line of the lower lid, into the tarsal plate and out of the skin 2–3 mm below the lower eyelid margin.
6. Align the lower lid bolster centrally, and pass the needle through it a few millimetres from one end.
7. Pass the other needle of the suture through the upper bolster – upper lid – lower bolster in the same way as the first needle, 2 mm from the other end of each of the bolsters.
8. Pass both needles through the shorter length of bolster, 2 mm from each end of the bolster (Figure 1a).

9. Slide the two lower lid bolsters upwards to close the eye. The smaller bolster ‘locks’ the lid closed (Figure 1b).
10. To separate the lids, pull the smaller bolster down and the lids will easily open.

If a single armed suture is being used, the needle can be passed from the lower bolster back up to the upper bolster.
The permanent tarsorrhaphy
(Figure 2a–f)
The upper and lower lids will not stay ‘stuck’
together when the sutures of a
temporary tarsorrhaphy lose their
tension after a few weeks. In a
permanent tarsorrhaphy, some
of the lid margin is debrided
which allows the lids to stick
together as they heal.
Permanent tarsorrhaphies
are almost always only
lateral so that the patient can
still see out of the central eyelid
opening and the eye can still be
examined. They should last at
least 3 months (and
sometimes forever).
The steps of a permanent
lateral tarsorrhaphy are:

1. **Anaesthetise** the upper
   and lower lids as above.

2. **Split the anterior and posterior
   lamellae** (Figure 2a). Use a number
   11 blade if available (or otherwise a
   number 15 blade) to cut along the grey
   line of the lateral third of the upper and
   lower lids to a depth of 2 mm. This will
   separate the anterior and posterior
   lamellae. Continue the split inferiorly
   (lower lid) or superiorly (upper lid) for
   about 5 mm using either a blade or
   spring scissors. Make sure you keep
   the split parallel to the tarsal plate so
   that the eyelid neatly separates into
   anterior and posterior lamellae. The
   eyelid is likely to bleed and this can be
   controlled with a few minutes of
   pressure. Cautery can be used if
   available.

3. **Excise 1 mm of the posterior
   lamella** (Figure 2b). This removes the
   epithelium of the lid margin and will
   enable the lids to stick together when
   they heal.

4. **Close the posterior lamella** (Figures
   2c and 2d). Pass the needle of an
   absorbable 5-0 or 6-0 suture into the
   posterior lamella of the upper lid and
   then bring it out a little bit further
   along the upper lid posterior lamella.
   Pass the needle into the posterior
   lamella of the lower lid in line with the
   point of emergence on the upper lid.
   Pass the needle so that it emerges
   from the posterior lamella of the lower
   lid in line with where the needle was first
   inserted into the upper lid. Repeat this
   with a second suture.

5. **Close the anterior lamella
   (eyelid skin)** (Figure 2e). Insert a
   needle drawing a 4-0 to 6-0 sized
   thread into the skin of the
   upper lid, 2–3 mm above the
   lid margin and bring it out of the
   anterior lamella of the upper
   lid margin. Pass the
   needle directly across
   into the anterior lamella
   of the lower lid margin
   and out of the skin 2–3 mm
   below the lid margin. Tie the
   suture. Repeat this with several
   sutures placed 3 mm apart until the
   skin is closed over the closed
   posterior lamella.

When you have finished the procedure
note the following two things (Figure 2f):

- If you have neatly joined the lateral
  third of the upper and lower eyelids,
  there will still be an opening that the
  patient can see through. The opening
  will obviously be narrower horizontally,
  but it will also be narrower vertically,
  which will give more protection to the
  cornea in the open area.

- In this procedure, the anterior lamella
  and eyelashes are undamaged –
  therefore if the tarsorrhaphy is opened
  at a later date, the lid will look almost
  normal. These tarsorrhaphies often last
  forever, but if they need to be divided
  this can be done by injecting some local
  anaesthetic and cutting the sutures.

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