

ELIZABETH BRADLEY: Hi I'm Elizabeth Bradley, an oculoplastic surgeon here at the Mayo Clinic. And I'm here today to talk to you about our recent efforts in facial reanimation. Here at Mayo Clinic, we have an interest in taking care of patients with facial nerve disorders through our facial reanimation clinic. This is a multi-disciplinary clinic led by Dr. Samir Mardini in Plastic Surgery, and with representatives from Ophthalmology, Neurology, and Physical Medicine and Rehabilitation.

We take care of all ages of patients with facial nerve disorders, including children with congenital facial nerve palsy, and adults with both acute and long standing facial nerve palsy. We also take care of patients who have aberrant regeneration after facial nerve palsy, manifesting as synkinesis or unwanted facial movements. In addition, we take care of patients with related cranial neuropathies such as patients with cranial nerve V disorders, which manifests as neurotrophic keratopathy shown here. Nearly all of our patients benefit from supportive care, including the use of artificial tears or gel, TranquilEyes, or other night time shield, and puncture plugs. And many patients are also using contact lenses, either high water content soft lenses, or scleral lenses.

We often employ Botox in patients with synkinesis. And we also can use it in patients with facial nerve palsy to treat the contralateral face to improve symmetry. Botox, however offers a temporary solution, and needs to be injected every three to nine months.

This composite slide shows a patient treated with Botox for synkinesis. On the top we see him in repose, and with pursing of the lips before Botox treatment. And on the bottom we see him again in repose, and with pursing of the lips with less closing of the eyelid after Botox treatment.

So what are the surgical treatments that we have available for patients with facial nerve disorders? We have a variety of treatments. With any of them, the goal is to achieve a more symmetric appearance at rest and in motion. We have static versus dynamic options. And in choosing the correct procedure for an individual patient, the issues to be considered include the patient's goals, patient age, the cause of facial paralysis and its duration, and patient co-morbidities.

This slide highlights some of the static options available. They include brow ptosis repair, upper eyelid bluffers blepharoplasty, upper eyelid weight, lateral canthopexy, lower eyelid retractor release, lower eyelid spacer graft, lower eyelid tendon sling, facial sling, and temporalis transfer. This slide shows an elderly patient before and after static surgery, including brow ptosis repair, blepharoplasty, lateral canthopexy, platinum weight, and temporalis transfer. And you can see the improvement in the overall symmetry of the face, particularly the brow, lower lid, and mid face.

This case highlights some of our efforts in treating lower lid retraction due to facial nerve palsy. The patient was a 48-year-old gentleman who had undergone resection of a pilocytic astrocytoma in 1999. He had cranial nerves V and VII involved. He was wearing a scleral lens, but it was tending to be decentered inferiorly, and he had longstanding lower eyelid retraction with paralytic lagophthalmos. The surgical plan for this patient was to perform a left mid-face lift, as well as palmaris longus tendon sling to the left lower eyelid, with a hard palate graft to the left lower eyelid, and left canthopexy.

The slide shows the template used for the hard palate graft harvest. And here, we have incised the conjunctiva and recessed the conjunctiva and lower lid retractors to prepare the bed for the hard palate graft placement in the gap in the posterior lamella. After that, the palmaris longus tendon is harvested from the wrist. We were able to preserve approximately half of the tendon. And we take a 9 centimeter piece of the tendon.

This is wrapped around the medial canthal tendon, and then tunnel subcutaneously deep to the skin and the orbicularis in the pretarsal plane. And then it exits laterally. And at that location, it is drilled into the lateral orbital rim to vertically suspend the lower eyelid. And here, we see the patient pre-operatively and post-operatively after the palmaris longus tendon sling.

Another eyelid procedure that could be helpful on these patients who've undergone previous gold weight placement, where the gold weight is visible because of its pretarsal location is to move the gold weight to a supertarsal location as seen in the lower panel here. And this slide shows pre-operatively versus post-operatively after the supertarsal weight placement, that we still obtain good closure, but with a cosmetically better appearance of the eyelid.

What are our options for dynamic facial reanimation? There are several principles that guide dynamic restoration of facial nerve function. First, we need to have a functioning nerve and muscle for facial movement. Second, facial muscles can respond to nerve grafting if they have been denervated for less than one year. And other muscle can be transferred into substitute for nonfunctioning facial muscles.

In addition, the contralateral facial nerve offers the best chance for spontaneous coordinated facial movement. This is typically obtained through crossface nerve grafting. Crossface nerve grafts require 8 to 12 months to become functional. And nearby functioning nerves can babysit facial muscles or transferred muscles to prevent denervation.

These sources of muscle and nerve for dynamic restoration of facial nerve function include both regional and distant sites. The muscle sites include the temporalis muscle, or the gracilis muscle used as a free flap. For the nerves, regionally we can use the masseteric nerve, or the hypoglossal nerve. And distally we can use the sural nerve.

This patient illustrates our efforts in dynamic facial reanimation. In December 2012, the patient presented to the Mayo Clinic following resection and radiation for astrocytic pilocytoma. We outlined a treatment plan to include a babysitter procedure from cranial nerves V and XII to the distal branches of cranial nerve VII, as well as crossface nerve grafting, right lower eyelid retraction repair, strabismus surgery, and fitting with a scleral lens.

Here's the patient's appearance pre-operative and for months following babysitter procedure, cross face nerve grafting, in one month following strabismus surgery. And we can see in the post-operative photograph, that in addition to the eyes being aligned, the lower eyelid retraction has improved, and the patient is starting to have the return of the nasal labial fold. Two months later, the appearance continues to improve with strengthening of the nasal labial fold, and overall improvement in the symmetry of the lower face.

In summary, static and dynamic options are available to manage facial nerve disorders. Facial nerve disorders are well-suited to a team approach to patient care. And several options are available to address paralytic lagophthalmos. These include use of a palmaris tendon sling to the lower eyelid, and super tarsal gold weight placement for the upper eyelid.

Finally, to refer patients with facial nerve disorders, you can contact us through the phone numbers listed there. Once again, I'm Dr. Elizabeth Bradley oculoplastic surgery here at Mayo Clinic, and we've been talking about facial reanimation surgery. Thanks very much for your attention.