Lingual Nerve Reconstruction Following Third Molar Extraction Using **Avance® Nerve Graft**, a Processed Predegenerated Human Nerve Allograft

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Introduction

Repair of lingual nerve injuries is traditionally performed via direct neurorrhaphy or, in the case of excessive tension or a segmental defect, with a nerve autograft. Avance® Nerve Graft provides an additional option when a tensionless primary neurorrhaphy cannot be performed. As a nerve repair option, Avance® Nerve Graft eliminates the need to harvest a donor nerve including the associated functional loss, but still allows for a nerve-to-nerve repair without tissue rejection.

The following is an example of a surgical technique for treating lingual nerve defect injuries following third molar extraction. The methods described here should be adapted by the surgeon to fit the specific case being presented.

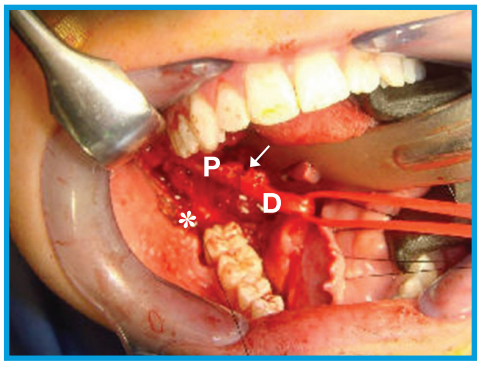

Figure 1. Confirmation of a Sunderland 5th degree injury of the right lingual nerve. Nerve is held together by a small amount of epineurial tissue. Distal nerve stump is being gently retracted using a vessel loop. **P** indicates proximal nerve and **D** indicates distal nerve, ***** indicates bone, arrow indicates site of injury.

Surgical Method

Assessing the nerve injury

1. Obtain access to the lingual nerve using a standard intraoral method. Make an incision to expose the ramus and continue along the lingual sides of teeth. Exploration is performed using surgical loupes or a surgical microscope. Dissection is performed through the periosteum to access the nerve.
2. The lingual nerve is carefully dissected from surrounding tissue. If necessary, to prevent the proximal stump from retraction, place a 6-0 nylon suture through the nerve epineurium immediately proximal to the injury site prior to completing the transection of the injured nerve. Resect damaged portion of nerve. Both proximal and distal nerve stumps should be evaluated via intraoperative biopsies to confirm presence of normal fascicular anatomy, absence of neuroma and absence of fibrosis. If cryosections indicate remaining fibrosis or disorganized nerve then continue to trim back 1mm at a time until organized nerve tissue is confirmed.

   Note: To access tensionless direct repair, nerve stumps are approximated using a single nylon suture. If nerve ends remain coapted with a single knot, then direct repair can be performed. If nerve ends separate, then a secondary neurorrhaphy is warranted.

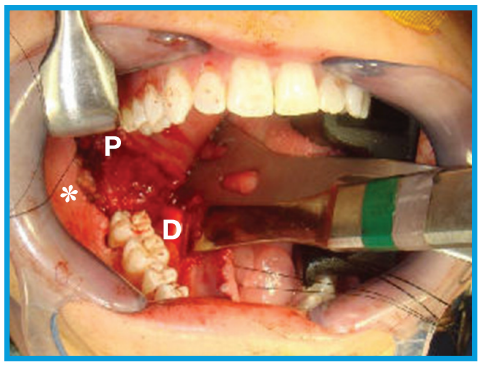

Figure 2. Identifying nerve stumps and assessing repair options. **P** indicates proximal nerve stump and **D** indicates distal nerve stump; ***** indicates suture used to prevent retraction of proximal stump.

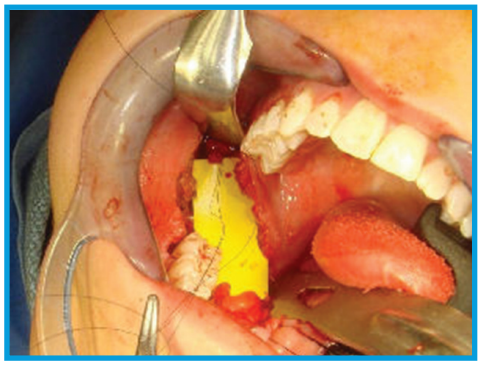

Figure 3. Visualization of an approximately 20mm segmental defect requiring nerve grafting material.

Preparing and implanting the Avance® Nerve Graft

3. Determine the appropriate size of Avance® Nerve Graft required to match proximal and distal nerve stumps. Typically a 3-4mm diameter by 30mm long Avance® Nerve Graft is an adequate size match for lingual nerve injuries.
4. Remove selected size of Avance® Nerve Graft from freezer. Using standard aseptic technique, peel open the foil pouch and pass the inner pouch into the sterile field. Thaw the tissue by placing room temperature sterile saline into the pre-molded thawing reservoir (see Figure 4a). The graft will thaw in approximately 5-10 minutes. See Instructions for Use for complete preparation details. Using a 15# blade or sharp scissors to cut and a sterile tongue depressor as a cutting surface, trim graft to length as required. Use microsurgical forceps to carefully transfer graft to the surgical field (see Figure 4b). Grafts may be gently grasped by the epineurium at either end of the graft but care should be taken not to crush the tissue during handling.
5. Perform epineurial repair using interrupted 8-0 nylon sutures at each coaptation. Place grafted nerve as deep as possible into surgical site. Based on the varied lengths available, Avance® Nerve Graft may provide a better opportunity to place the graft deeper into the surgical site to protect nerve from future injuries.

Closing

6. Use standard microsurgical closing techniques and post-operative instructions as following direct nerve repair.

Figure 4a. Thawing tissue with room temperature sterile saline.

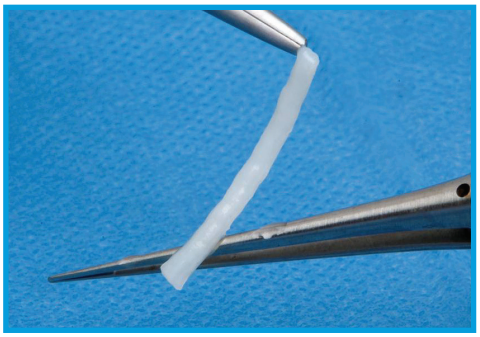

Figure 4b. Transferring thawed product to the surgical field for implantation.

Background and Outcome

The lingual nerve reconstruction technique described in this document is based on a series of cases from Dr. James Green. The specific surgical photos are from the case of a female patient who was referred with anesthesia (without dysesthesia) following extraction of her right third molar. Surgery was performed 1 month after referral. Exploration revealed a complete transection injury to the right lingual nerve (Sunderland 5th degree injury). An Avance® Nerve Graft (3-4mm diameter x 30mm long) was trimmed to approximately 20mm to bridge the defect and allow for passive positioning of the nerve. The repair site healed well with no scarring or signs of rejection. Seven month follow-up testing demonstrated recovery of pain sensation, return of light static touch (26g/5.46) and return of directional sensation (3 out of 10 correct).

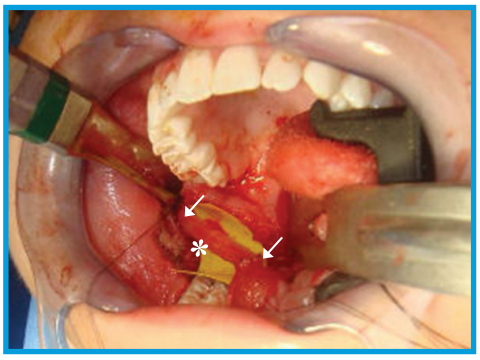

Figure 5. Avance® Nerve Graft *in situ* after repair. * indicates graft and arrows indicate coaptations. Typically the sural or great auricular nerves are used as the autograft option for lingual nerve repair. Both of these nerves are usually smaller in diameter than the lingual nerve which may make Avance® Nerve Graft, available in a range of sizes, a better option in terms of size matching.

For additional information on

Avance® Nerve Graft

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