

## Alternative use of the electrical burn appliance

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## CASE REPORTS

### Introduction

Electrical burns to the oral commissure result in significant contracture, with resultant microstomia and severe disfigurement if left untreated. Successful management requires the skills of both the pediatric dentist and plastic surgeon, and good cooperation from the patient and parents. Splinting appliances reportedly have reduced the possibility of scar contracture following a burn to the lips and/or commissure. The splinting appliances (fixed or removable) are worn continuously, usually for six to 12 months until the scar tissue has lost its contractile property.<sup>1-6</sup>

The splinting appliance is easy to fabricate, and its design allows it to be utilized for procedures other than electrical burn treatment. Recently, the appliance was adapted to assist in facial reanimation surgery for facial paralysis. Patients with facial paralysis secondary to congenital defects, malignancies, and viral illness desire the restoration of normal involuntary function on the affected side. The surgical procedure, although not perfected at this time, offers some hope to patients who suffer from facial paralysis. The surgery is completed in two steps. Initially, branches of the facial nerve from the unaffected side are tunneled across the face to the opposite side (cross facial nerve grafting). This is followed by transplantation of a portion of the gracilis muscle, complete with artery, vein, and nerve, to the affected side between the zygoma and the commissure. The nerve is anastomosed carefully with the previously crossed facial nerve, and the vein and artery are anastomosed with the facial nerve and artery. The cross facial nerve grafting must be completed six to 12 months before the muscle transplant to allow for neurotization of the nerve. It is necessary to graft the gracilis muscle, because long-term facial paralysis results in significant muscle atrophy on the affected side.<sup>7, 8</sup>

The key to the success of this surgery is good nerve, artery, and vein anastomosis, proper muscle size selection, and applying the appropriate muscle tension to give a natural result to the patient. The splint is used during the immediate postsurgical period to assure that the appropriate amount of muscle tension is applied; this may prevent muscle detachment by keeping the commissure from being pulled toward the midline by muscle activity of the normal side.

### Case Report

A 5-year-old Caucasian female was evaluated by the Craniofacial Team at the Indiana University Medical

Center, Indianapolis, Indiana. She was normal except for a history of trauma at birth, which resulted in right side facial paralysis. Because of the visible lack of muscle tone on the affected side and the lack of involuntary function, the decision was made to complete a cross facial nerve graft followed by the transplantation of the gracilis muscle. The morning of the gracilis muscle transplantation, a maxillary impression was made and poured in stone. A removable acrylic retainer with clasps then was fabricated (Fig 1). An extension of the appliance with wire embedded in acrylic, similar to a removable electrical burn appliance, was placed on the side of the planned surgery. The correct position of the extension was determined by locating the patient's midline and the position of the commissure of the unaffected side.

After surgery, the appliance was inserted and adjusted (Fig 2). The appliance was used postoperatively

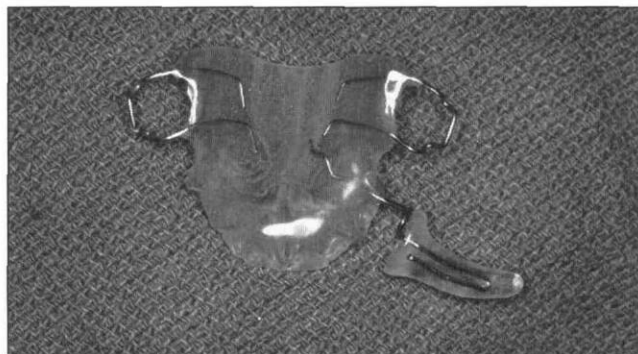


Fig 1. A removable acrylic retainer with clasps.

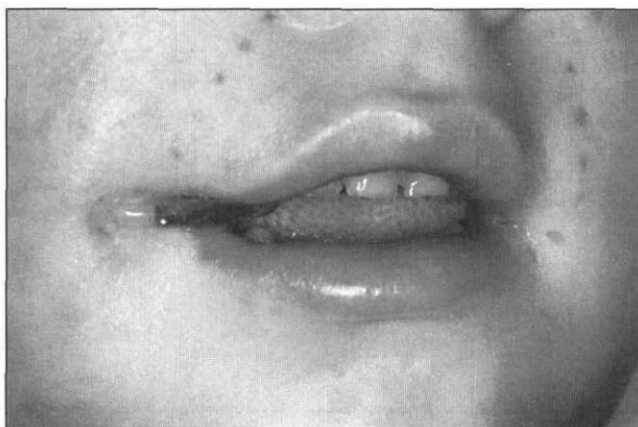


Fig 2. The patient with the appliance in place.

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for three weeks. During this time, the appliance was worn 24 hours a day, except when it was cleaned.

## Discussion

Ideally, the removable splint should be placed at the time of surgery. By relieving tension on the muscle-commissure, the possibility of muscle detachment or disruption of the delicate microanastomoses of the vessels and nerve during the early postoperative period is lessened considerably. In addition, the splint allows the surgeon to achieve better facial symmetry and an improved functional result. The appliance is relatively easy to fabricate and provides the extra security that the plastic surgeon requires when performing this complex surgical procedure. This case illustrates the principles learned by treating burn patients with fixed and removable splints and applies them to a unique medical situation to maximize the results and benefit for the patient.

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