**ABSTRACT**

Repair of aural atresia is a technically demanding operation. Post-operative external auditory canal stenosis is one of the most common complications. We describe a useful technique for handling the split thickness skin graft used to line the EAC, and review our experience in a series of 27 patients.

**INTRODUCTION**

Repair of aural atresia is a technically demanding operation. The primary goal is to improve hearing by creating an adequate external auditory canal and mobile ossicular chain. An important aspect of the procedure is lining the new auditory canal with skin. Evolution in the surgical technique from using a full-thickness skin graft, to various split-thickness skin graft techniques have seen the rate of external canal stenosis decrease. However, canal re-stenosis remains the most commonly reported complication in aural atresia repair, occurring with a frequency of 7-31% in the recent literature.

Here we discuss a useful technique in preparing and handling the split thickness graft, and present our experience with atresia repair both before and after adopting this technique.

**METHODS AND MATERIALS**

27 patients underwent repair of either congenital aural atresia or external canal stenosis at the New York Eye and Ear Infirmary between 2001 and 2007. The charts of these patients were reviewed and information regarding the surgical technique was obtained. Patients were classified as “new” if the split-thickness skin grafting technique described below was used, and “old” if another technique was used. The development of post-operative EAC stenosis requiring revision, and the timing of revision surgery was noted.

**Surgical Procedure**

Repair of the bony canal atresia was performed via an anterior approach. A split thickness skin graft is obtained from the ipsilateral thigh using a Zimmer dermatome set to a thickness of 0.010 inches. The harvest site is dressed with Xeroform gauze and an occlusive dressing. The skin graft is then placed epidermal side up on a flat surface, and held flat by placing hemostats at each of the four corners (Figure 1). Mastisol is then applied to the epidermal surface and allowed to dry. Thin silastic sheeting (0.001 inch) is then placed over the epidermal surface (Figure 2). The graft-silastic complex is then cut to the desired size. Triangular tabs are fashioned on the deep surface (Figure 3). The graft-silastic complex is then cut to the desired size. Triangular tabs are fashioned on the deep surface (Figure 3). The graft-silastic complex is then rolled into a cylinder, and carefully placed into the newly created external auditory canal (Figure 4). The triangular tabs are meticulously unfurled over the temporals fascial graft, such that they do not overlap. A disc of thick silastic is then placed medially to prevent lateralization of the graft. The lateral edges of the graft are trimmed and sutured to the skin of the meatus with 5-0 plain gut. Gel foam is used to pack the medial canal, and several strips of bacitracin-coated merocel are then placed into the canal. The Merocel sponges are removed at the first post-operative visit one week later. The silastic is allowed to separate from the graft completely prior to removal (typically 2 weeks post-op). Remaining gel foam is removed by post-op week 4.

**RESULTS**

14 patients (mean age 14.8 years) underwent the described procedure from 2007-2009. After an average followup of 13.8 months, 2 required revision surgery for re-stenosis of the external canal, a rate of 14%. The average time to revision was 6 months. Notably, 3 of the 14 patients represented revision cases, none of which have re-stenosed to date. This revision rate represents a dramatic improvement from a series of 13 patients operated from 2001-2006 (mean age 26.3 years), using a split-thickness skin graft cut into multiple strips, and placed without silastic reinforcement. Of those 13 patients (followed for an average of 41 months), 6 required re-operation for external canal restenosis, a rate of 46%. In this group, the average time to revision was 4.8 months.

**DISCUSSION**

As the technique of atresiaplasty has evolved over time, so has the method for providing an epithelial lining for the newly created external auditory canal. Post-operative canal stenosis has dramatically decreased from initial series using full-thickness skin grafts, but remains a common complication. Similar to our series, De la Cruz reported a decrease in external canal stenoses with the adoption of new techniques (13.9 to 3.8%), including using a thinner split thickness graft, lining the EAC with silastic after graft placement, and using Merocel wicks in the EAC.

We feel the technique of fixing the silastic to the graft prior to placement in the EAC renders the graft easier to manipulate and precisely position. Furthermore, it allows the skin to be placed smoothly along the bony canal, without bunching and wrinkling. Although the followup of our newer cases is shorter than the older group, it is likely that the decreased incidence of stenosis will remain stable over time, as the average time to revision for both groups is less than 6 months. The literature bears this out, with most series reporting no cases of re-stenosis beyond 1-2 years.

**CONCLUSIONS**

Fixing thin silastic sheeting onto the epidermal surface of the split thickness skin graft prior to placement in the newly created external auditory canal facilitates handling and positioning of the graft. Adoption of this technique correlated with a decrease in post-operative external canal re-stenosis requiring revision in our series.

**REFERENCES**