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Installing a Pull String

So, your patient has come into your office and complains they are having a hard time removing their hearing aid from their ear. Adding a pull string is an easy way to fix this problem, and only takes a couple of minutes. No need to send this one back to the manufacturer. This is another one of those instant gratification points you can receive from your patient.

There are actually several methods used to install a pull string. We will focus on a couple of the most popular methods here that do not require opening the hearing aid.

Prepping the string

Either method we choose is going to need some sort of string, so we'll start with prepping the string. You will need 15lb test fishing line and a sharp razor blade for this step. Cut a piece of fishing line from the spool approximately 2" in length. On one end of the piece you have cut, use a razor blade to cut a sharp angle. This angle will aid when inserting the line into the hearing aid.

Drilling the hole

This is the most critical part as you are going to be drilling a small hole into the faceplate and you don't want to be drilling into any components. You will need a #75 drill bit installed in a pin vise for hand drilling. You will want to set the depth of the drill to be just a little deeper than the faceplate. You don't want to drill any deeper into the hearing aid than needed to prevent running into any wires or components. Now, choose a nice flat spot on the faceplate and hand-drill your hole. Once through, twist the drill several times to clear away the debris created from drilling. If the spot you chose is close to the edge of the faceplate, keep in mind the edge of the shell is likely beveled, plus the shell will have a thickness to it, so remember to account for this distance from the edge to avoid drilling through the shell.

Installing the string

You will need some super glue and the 2" string you prepped earlier. First, insert the angled end of the fishing line into the drilled hole to make sure you have a good fit. Remove the line and dispense a drop of glue onto the angled end of the fishing line. It is sometimes helpful to drag the line through the drop of glue a little bit to spread the glue out on the line ¼" or so. If this is not convenient, it is sometimes helpful to drop some glue onto the bottom of a Dixie cup which has been placed upside down, and then dip the end of the fishing line into the glue. Upside down waxed Dixie cups make a great disposable work surface for messy procedures, such as gluing. Next, while the adhesive is still fresh insert the glued line into the hole you have drilled in the faceplate.

After 30 seconds or so, pull on the string to make sure it has adhered to the faceplate. If the fishing line pulls out, re-drill the hole, reapply glue and reinsert the fishing line. Once the string is secure, cut the free end of the fishing line to length.

Making the pull string ball

Now that you have the string anchored you will need to fabricate a ball on the free end of the string to give the user something to grab when removing the hearing aid from the ear. There are 2 popular methods for this, and we will look at both to cover which method may work best for you.

Method 1: Polymer method

Using an upside down waxed Dixie cup as a work surface, dispense some super glue and some white polymer powder onto the Dixie cup surface. Keep these materials separate. You can also use beige polymer, or brown depending on cosmetic appeal. Hold the hearing aid so the free end of the fishing line is pointing downward. Dip the end of the fishing line, first into the super glue, then into the polymer powder, and then back into the super glue. Alternate dipping into the super glue and into the polymer powder until you have achieved the desired size ball for the end of the pull string. Your first and last dip should be into the super glue.

Now, stick the hearing aid onto a piece of Funtac and position the hearing aid so the pull string ball is facing downward to prevent any glue from migrating up and onto the string. Let the pull string cure in this position for 30 minutes.

Method 2: UV method
You will need super glue, a 2mm plastic seed bead (available through a craft store), UV material (preferably in a small bottle), and an UV cure device.

Using an upside down Dixie cup as a work surface, place the seed bead onto the Dixie cup surface, as well as a small amount of glue. While holding the hearing aid, dip the end of the fishing line, first into the glue, then into the hole in the center of the seed bead. The bead should now be attached to the fishing line. Next dip the bead into UV material, and then cure for a few seconds with an UV cure device.

A note about using UV material for the pull string:
You have a lot of flexibility when it comes to using UV material to create the pull string ball. Where you are using a seed bead as a base you end up with a nice round ball which is very repeatable. And you also can use any color you wish for the ball, especially if you use shell material. Lacquer is also easy to use, but it primarily comes in clear, so color isn't easily accomplished unless you add a dye. It is possible to do, but probably more trouble than it is worth. Remember, if you use shell material you will end up with a sticky residue called the oxidation, or "smear" layer once cured. Just wipe off with alcohol and a paper towel

Always test the pull string
One final word on pull strings: Always give them a little tug before giving the hearing aid back to your patient Although most pull strings stay attached for years, once in awhile you may have one where the adhesive didn't glue completely. Always better for you to find a problem than your patient.

About the Author
Chris Perkins is the owner of Lightning Enterprises, and facilitates the Lightning Enterprises newsletter. He has worked in the hearing aid industry since 1991 in hearing aid manufacturing and product development, as well as equipment and process consulting.