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Head and Neck Surgery . Ear, Nose and Throat Surgery . Facial Plastic & Reconstructive Surgery

Otolaryngology – Head and Neck Surgery
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FACTS ABOUT PE TUBES

The term "Pe tubes" stands for small tubes inserted through an incision in the ear drum, which are meant to equalize air pressure between the middle ear and the outside environment. Hence, they are referred to as pressure equalizing or "Pe" tubes. In the past, many people thought that the PE stood for polyethylene, but only a very rare tube is now made from polyethylene. These tubes are commonly made from a variety of synthetic substances including silicone and various metals, particularly stainless steel and titanium. Dozens of different designs exist, depending on the intent of the tube and some are intended to be inserted in the ear drum for a short period of time and others for a lengthy period of time, up to several years.

An incision is made in the ear drum to allow insertion of the tube. They generally stay in the ear fro 6 to 12 months. Then, they frequently fall out unobserved. When they are ready to fall out, the child may experience slight earache and a drop or two of blood may come out. Showering, shampooing, and bathing in the upright position do not require any kind of water protection. Swimming is usually okay without water protection, too, although some children require an earplug just for comfort.

Reasons for inserting PE tubes in an ear drum are primarily two in number. One is to prevent negative pressure in the middle ear space; this prevents an accumulation of fluid in the middle ear. It is known from experimental evidence that negative pressure in the middle ear space causes fluid accumulation. This is based on the observation that when the eustachian tube, which connects the ear to the nose and throat, is experimentally occluded, first negative pressure, then fluid, will form in the middle ear space. It is also demonstrated by the occurrence of fluid in the ears of people who develop tumors at the end of the eustachian tube behind the nose. However, such mechanical obstruction cannot explain all of the cases of accumulation of fluid in the middle ear space and some middle ear spaces probably become chronically infected and have abnormal cells in the lining membrane which produce excessive amounts of mucus. This situation seems to be corrected by the insertion of tubes for a period of two months or more, in many cases.

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Finally, it has been shown by well-controlled studies that the insertion of tubes will reduce the average number of infections in a given ear. In a specific example, one-hundred children were studied who had, on the average, five ear infections per year and after the tubes were inserted the children sustained, on the average, fewer than one ear infection per year, while a control group without tubes continued to have about five infections per year.

All of the facts concerning recurrent infection of the middle ear space and the build-up of fluid in the middle ear space are not known. Many seminars have been conducted on this subject without arriving at definitive conclusions that would be applicable to each and every case. Some of the factors that definitely contribute to repeated infections of the build-up of fluid in the ear include specifically, allergy, enlarged adenoids and sinus infection. Naturally, if any of these

factors can be easily identified it should be dealt with; however, in many cases it seems more appropriate to manage the ear infection first so as not to subject a child to x-ray or other invasive means of investigation.

The tubes do have some complications. Theoretically, any time that an ear drum is manipulated, hearing loss of the permanent variety could result, although this is thought to be very rare. The application of a suction device in the ear, needed to remove the fluid from the middle ear space, is also thought possibly, by virtue of the loud noise generated, to cause some hearing loss. At least it has been conjectured that this might happen. When the tube eventually falls out of the ear drum, as it almost always does, it leaves behind a hole. In a small percentage of cases, this hole will not close. Over the course of more than twelve thousand plus PE tube insertions, I have had seventeen ears in which the hole did not close following the ejection of the tube. Two of these eventually closed after intervals of one and a half and two years respectively. Others have not closed. Whether it is desirable for these holes to close in these particular ears is debatable as it does provide a ready means of pressure equalization. So long as repeated infections or ingrowth of the skin of the ear drum in the middle ear does not occur, there would seen to be no reason to close these in young children until the age of ear infections is over.

Another complication that can occur is infection in and around the tube itself. This often represents an upper respiratory infection, which goes up the eustachian tube to the middle ear space and then drains out through the PE tube. Theoretically at least, this probably is preferable to the situation which would have occurred had the tube not been present, namely, pus under pressure in the middle ear space. This can be dealt with by antibiotic, by the use of drops, by cleaning of the infected material from the ear canal in the office, or by a combination of the above measures. Sometimes a wick needs to be inserted to draw medication down into the area of the PE tube. Sometimes, a coating of bacteria known as a biofilm attaches itself to the tube. The only way to clear this up is to remove the tube until the infection heals.

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Finally, in the same series of more than twelve-thousand PE tube insertions, I have had four PE tubes deposit themselves within the middle ear space proper rather than being lost outside, into the ear canal. These tubes, in two instances, were not associated with any infection and can be visualized behind the ear drum. In the other two cases, the tube did seem to be associated with ongoing inflammation in the middle ear space and was removed the way it had been put in; by making a simple slit, called a myringotomy, in the ear drum and withdrawing it from the middle ear space.

Overall, the tubes have a high success at controlling ear disease while they are in place. A rough figure of about eighty-five percent of the cases requires only one set of PE tubes. Other times, multiple sets may be required and if more than one set of tubes seems to be necessary, we strongly feel that many of the other factors should be investigated including allergy, sinus infection, immune status and that the adenoids should also be considered to possible be contributory.

Recent evidence suggests that adenoidectomy plus myringotomy (making a slit in the ear drum) has results equally good at one year, as does the insertion of tubes. While this procedure is often necessary, the tube insertion is quicker, simpler and a tiny bit safer than adenoidectomy and myringotomy. The choice of procedures depends on the nature of the problem, time of year and many other factors.