A 12-year-old male with no past medical history presented to clinic with complaints of recurrent left-sided facial weakness (Figure 1). The first episode occurred 9 months earlier when he presented to the emergency department. Lyme titers performed at the time were negative. This episode resolved after several days. Over the ensuing months, he had 6 other episodes of left facial weakness with complete resolution between episodes. There were no associated symptoms or identifiable triggers. The patient also reported left muffled hearing but denied vertigo or tinnitus. There was no history of acute or chronic otitis media and surgical history was negative.

Physical examination with a microscope was significant for mucoid effusion in the left ear with retraction of an intact tympanic membrane. The right ear was unremarkable. Weber with a 512 Hz turning fork lateralized to the left. Rinne with a 512 Hz tuning fork showed air conduction greater than bone conduction in both ears. There was neither facial asymmetry/edema nor a fissured tongue.

An audiogram performed 1 month prior to his otolaryngology visit showed a mild conductive hearing loss on the left and a minimal low-frequency conductive hearing loss on the right. Tympanometry showed bilateral negative peak pressures (right: 180 daPa, left: 335 daPa).

Given the recurrent episodes of facial nerve palsy, evidence of chronic left ear effusion, and conductive hearing loss, the patient was offered bilateral myringotomy with tympanostomy tube placement in the operating room. Subsequent computed tomography (CT) of the temporal bones showed opacification of the hypotympanum and mastoid, though no evidence of bony erosion, cholesteatoma, or facial canal dehiscence (Figure 2). Bilateral Reuter Bobbin tympanostomy tubes were placed with the use of an endoscope. In the operating room, the left tympanic membrane was found to be retracted with effusion in the middle ear. After the myringotomy thick, mucoid middle ear effusion was found and cleared with suction (Figure 3). The right ear had no tympanic membrane retraction and the middle ear was found to be free of effusion after myringotomy.

Three weeks after tympanostomy tube placement, the patient presented for postoperative follow-up and denied any episodes of facial paresis. A follow-up phone interview with the father 5 weeks after follow-up confirmed that the patient remained asymptomatic.
but also stratified the specimens into age groups. They showed that 49% of children aged 10 to 19 years had at least one area of dehiscence and 17% had microdehiscence.12

This patient did not have radiographic evidence of facial canal dehiscence but may have had a microdehiscence not appreciated on thin-slice CT. Even a small communication with the facial nerve could provide a mechanism for pressure to be exerted on the facial nerve and/or the vascular plexus over the nerve sheath. Fluctuations in middle ear pressure may compress the facial nerve enough to cause temporary paralysis or, more likely, compress the vascular plexus over the nerve sheath to cause a temporary ischemic neuropraxia.3

Given how common chronic otitis media with effusion and facial canal dehiscence appear to be in children, one would expect the presentation of facial nerve paralysis to be more prevalent. This may be explained by a variance of maximum middle ear pressure before spontaneous Eustachian tube opening. Generally, pressures exceeding 29 mm Hg result in passive Eustachian tube opening; however, some reports have documented pressures as high as 60 mm Hg required for spontaneous opening of the Eustachian tube.3,13,14 If this particular individual could accommodate a higher middle ear pressure before spontaneous equalization, he may have been able to meet the threshold to cause facial nerve paresis. Given the fact that capillary perfusion pressure ranges between 22 and 32 mm Hg, a middle pressure greater than 32 mm Hg may be enough to cause a temporary facial nerve paresis.

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Figure 2. Axial CT of the left temporal bone. Cuts from superior (A) to inferior (C), with black arrows representing facial nerve within facial canal. CT indicates computed tomography.

Figure 3. Endoscopic-assisted placement of a left tympanostomy tube. A, Air-fluid level of a middle ear effusion before myringotomy. B, Suction of mucoid effusion after myringotomy. C, View after placement of Reuter Bobbin tympanostomy tube.
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