Retained Surgical Cottonoid in the Closed Mastoid Cavity for 14 Years After Canal Wall-Up Mastoidectomy

Eunkyung Jung, MD¹, and Chul Ho Jang, MD, PhD¹

Case Report

A 46-year-old woman was referred to our department after presenting to a local clinic with recent onset of intractable otorrhea and otalgia by topical treatment. She was referred to our department. History taking revealed that she had undergone tympanomastoidectomy 15 years ago in other hospital. She had experienced intermittent headaches for the previous 11 years that were controlled by medication. Magnetic resonance imaging (MRI) performed twice revealed no significant findings. Otoendoscopy findings showed intact neodrum without perforation. There was no granulation tissue within the external auditory canal. The pus culture and sensitivity test revealed no growth microorganism. Pure-tone audiometry revealed left-sided conductive hearing loss with bone conduction of 20 dB and air conduction of 35 dB under a conventional 3-frequency average. Temporal bone computed tomography reveals curvilinear radiopaque material along with dense soft tissue in the left mastoid cavity without opacification of the previous canal wall-up mastoidectomy site (Figure 1). The otorrhea was stopped by diluted vinegar irrigation with ototopical ciprofloxacin drop. Based on these examination findings, we planned endoscopic revision tympanoplasty with mastoidectomy. The surgery was performed under local anesthesia. Using an endoscopic approach, a tympanomeatal flap elevation was performed. The left tympanic membrane was lateralized, detached from the handle of malleus, and released from the promontory that was adhered to by fibrous tissue. The ossicle chain was intact. Through the antrum and attic, a mastoidectomy was performed. Foreign body material resembling cottonoid surrounded by granulation tissue was identified and

Figure 1. A, Axial unenhanced computed tomography (CT) image showing dense hyperattenuated metallic filaments without opacification of the mastoidectomy cavity. B, Coronal unenhanced CT image showing the characteristic curvilinear metallic density with a dense soft tissue.
removed (Figure 2). The tissue was sent for pathological examination. The tympanomeatal flap was adjusted, and nylon mesh and Merocel packing was performed using the rosebud technique. The pathological examination of the foreign body and granulation tissue showed foreign body material with fibrosis. A high-power microscopic examination demonstrated multinucleated foreign body giant cells (Figure 3).

Discussion
A few studies of gossypibomas, the most accepted term for “retained surgical sponge,” have been published, mostly in cases of abdominal and pelvic surgery.1,2 Despite a reported incidence of gossypibomas of 1 in 100 to 3000 of all surgical interventions, cases are rarely reported in head and neck surgery. The only case report of retained surgical cotton sponge in microscopic ear surgery was published in 1954.3

Although difficult to diagnose by otoendoscopic examination, nonresorbable cottonoid surgical sponge has a radiopaque barium sulfate monofilament marker, which is readily visible on temporal bone CT and on plain radiographs.1 These filaments appear as curvilinear hyperattenuated structures. Due to the history of intermittent headache, the patient underwent an MRI twice prior to visiting the otolaryngology department. The radiologists found no significant abnormality. Since barium sulfate is a proton-poor compound, it is generally not detectable on MRI.2 Magnetic resonance imaging is more useful when the foreign body reaction appears as a mass lesion.4 Few reports of MRI described a retained sponge as a dense soft tissue mass with a thick and well-defined capsule.2,5 Another study reported whorled stripes with a central low-signal portion on a T2-weighted image.6 The patient showed a low signal on T2-weighted image in both previous MRI studies suggesting fibrotic tissue with no fluid.

A mastoidectomy while removing the foreign body and the surrounding granulation tissue was sufficient for complete treatment. One study showed that the longer the retention time, the higher were the risk of complications, such as an increase in fistula formation in other body parts.7 However, even though the foreign body material had been in the patient for 14 years, she had experienced otorrhea and otalgia but no perforation or erosive lesions on the external auditory canal. In a prior case report published in 1954, the patient carried foreign body material for 32 years but recovered fully from vertigo and otorrhea postoperatively.3

Declaration of Conflicting Interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD
Chul Ho Jang https://orcid.org/0000-0003-4084-2301

References
1. Kim AK, Lee EB, Bagley LJ, Loevner LA. Retained surgical sponges after craniotomies: imaging appearances and complications. AJNR Am J Neuroradiol. 2009;30(6):1270-1272.
2. O’Connor AR, Coakley FV, Meng MV, Eberhardt SC. Imaging of retained surgical sponges in the abdomen and pelvis. AJR Am J Roentgenology. 2003;180(2):481-489.
3. Cross RJ, Brower WJ. Cotton granuloma of the mastoid; case report. Laryngoscope. 1954;64(10):867-871.
4. Nishio Y, Hayashi N, Hamada H, Hirashima Y, Endo S. A case of delayed brain abscess due to a retained intracranial wooden foreign body: a case report and review of the last 20 years. Acta Neurochir. 2004;146(8):847-850.
5. Kim CK, Park BK, Ha H. Gossypiboma in abdomen and pelvis: MRI findings in four patients. AJR Am J Roentgenology. 2007;189(4):814-817.
6. Manzella A, Filho PB, Albuquerque E, Farias F, Kaercher J. Imaging of gossypibomas: pictorial review. AJR Am J Roentgenology. 2009;193(6 suppl):S94-S101.
7. Tacyildiz I, Aldemir M. The mistakes of surgeons: “gossypiboma”. Acta Chirurgica Belgica. 2004;104(1):71-75.