A Case of a Retained Surgical Sponge after Endoscopic Sinus Surgery Depicted on CT Imaging

Song-Mee Cho, M.D., Byung Guk Kim, M.D.

A retained surgical sponge is an uncommon complication in endoscopic sinus surgery. A 53-year-old woman who underwent endoscopic sinus surgery two years prior presented with nasal stuffiness and posterior nasal dripping that had persisted for one year. On CT images, a soft-tissue mass with mixed high and low attenuation was noted in the posterior air cells of the right ethmoid sinus. CT imaging features of the surgical sponge granuloma are described.

Index words: Surgical sponges
Ethmoid sinusitis
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An intranasal endoscopic operation of the paranasal sinuses for chronic sinusitis is mainly performed to open the narrow bony points and to restore ventilation and internal drainage. Obstruction of the anterior ethmoid cells and the frontal recess by scar tissue or by a granulation polyp is a common cause of recurrent sinusitis after an ethmoid sinus operation (1). Mucocele formation, due to scarring in the frontal recess, may be also a cause of recurrent disease. Although rare, a retained surgical sponge can cause recurrent sinusitis after endoscopic sinus surgery (2). A case of a retained surgical sponge with granuloma is presented.

Case Report

A 53-year-old woman presented with nasal stuffiness and posterior nasal dripping that had persisted for one year. The patient had a history of endoscopic sinus surgery at another clinic that was performed two years prior. Endoscopic findings of the nasal cavity showed a polypoid change of the nasal mucosa and mucoid discharge. Evidence of previous endoscopic sinus surgery was noted with a middle meatal antrostomy on the right side. CT images obtained with and without the administration of contrast agent demonstrated the presence of a mildly enhanced soft-tissue mass in the posterior air cells of the right ethmoid sinus with an irregular and linear internal structure of mixed high and low attenuation (Fig. 1). The attenuation value of the lesion ranged from 60 to 70 HU on a precontrast scan and from 80 to 90 HU on a postcontrast scan. A moderate space-occupying effect was noted with displaced adjacent bony septa of the right ethmoid sinus. CT imaging features of the surgical sponge granuloma are depicted on CT imaging.
Discussion

Nasal packing after endoscopic sinus surgery is performed for bleeding control. Nasal packing with different materials such as cotton gauze (Furacin impregnated gauze) or absorbable hemostatic material or no packing method have been used for better clinical effects. Usually, the nasal packing is removed during the acute postoperative phase, that is, the first or second day after surgery. Though more commonly associated with other general surgeries, a retained surgical sponge ("gossypiboma") may be seen in patients that have undergone endoscopic sinus surgery, as a surgical sponge is frequently used in dissection and hemostasis. Only two cases after endoscopic sinus surgery have been reported including the present case (2).

Imaging features of a retained surgical sponge might be non-specific and might vary depending upon the time that has elapsed between surgery and the detection and state of the granulation tissue. Packing gauze used for endoscopic sinus surgery does not usually contain radiopaque marker materials and may be difficult to recognize on radiological studies (3, 4). A retained surgical sponge and granulation that manifested as an enhanced solid mass on CT images in our case showed the space-occupying effect of a gossypiboma, including apparent bone remodeling, which has been previously described by Gotwald et al. (2). The differential diagnosis of a mass in the ethmoid sinus includes a granulation

Fig. 1. CT imaging findings are presented for a 53-year-old woman with nasal stuffiness and posterior nasal dripping that had persisted for one year. Non-enhanced axial image (A) at the level of the ethmoid sinus shows a soft-tissue mass (arrows) with an irregular and linear internal structure of mixed high and low attenuation on the posterior air cells of the right ethmoid sinus. Contrast enhanced axial (B) and coronal (C) images reveal contrast enhancement on the internal structure of the mass (arrows).

Fig. 2. A. A surgical specimen of the revised endoscopic sinus surgery performed on the right ethmoid sinus shows the surgical sponge and granulation tissue.
B. A photomicrograph shows chronic inflammation and a foreign body reaction with macrophages engulfing foreign bodies (H & E staining, × 400).
polyp, fungal sinusitis or sinus tumors. In contrast to soft-tissue masses such as polyps or tumors, the retained surgical sponge in our case showed an irregular and linear structure of a enhanced mass in the ethmoid sinus and the CT attenuation value was very high (60–70 HU) on a precontrast scan. A mucocele, a common complication following endoscopic sinus surgery, can be excluded in the differential diagnosis as a mucocele is usually seen as a cystic lesion of mucoid attenuation ranging from 10 to 20 HU with a peripheral smooth enhancing wall [5, 6]. MRI may demonstrate the presence of a foreign body and the internal structure of a retained surgical sponge and granuloma with more detail as compared to CT imaging (7). However, MRI is not frequently used in sinonasal disease since bone is demonstrated only as a signal void and inflammatory disease may be over-diagnosed. MRI is not considered as an adequate substitute for CT imaging in sinonasal disease. Therefore, CT findings of a retained surgical sponge and granuloma are important and radiologists should be aware of the CT findings.

Although a retained surgical sponge is an infrequent complication of endoscopic sinus surgery, a radiologist should be aware of the possibility of a retained surgical sponge when a soft-tissue mass is encountered with the internal structure of mixed high and low attenuation on CT imaging. With careful evaluation of CT findings, the presence of a surgical sponge and granuloma in the sinus might be detected by analysis of the morphology of a high attenuation region and enhancement pattern. Due to legal issues, the ability to detect a retained surgical sponge and to report the findings immediately is of importance [8].

References