

Long-term Retention of Ethmoid Sinus Foreign Body Manifested as Chronic Paranasal Sinusitis

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Sinusitis due to long-term retention of sinus foreign body is uncommon. We report a 39 year-old man who had suffered from bilateral ethmoid sinusitis for 20 years. A ballpoint pen cap was found incidentally during functional endoscopic sinus surgery. Sinus symptoms were relieved dramatically after foreign body removal. Compared with other sinus disorders, ethmoid sinus foreign body is an unusual condition. We review the literature associated with sinus foreign bodies and discuss their routes of penetration and complications. (*Mid Taiwan J Med* 2005;10:159-63)

Key words

endoscopic sinus surgery, sinus foreign body

INTRODUCTION

Chronic paranasal sinusitis caused by sinus foreign body is uncommon. Sinusitis induced by long-term retention of sinus foreign body is even less reported. The majority of sinus foreign bodies are found in the maxillary and frontal sinuses because they are more proximal than ethmoid and sphenoid sinuses [1,2]. Foreign body can cause inflammatory and infection process [1-3], and occasionally, malignant change [3,4]. Sinus CAT scan is helpful in diagnosing sinus foreign bodies. However, some foreign bodies can go undetected. Thus, continuous close follow-up of a patient's sinus condition after facial trauma is necessary to rule out the diagnosis of sinus foreign body. Endoscopic sinus surgery (ESS) is the first choice in treating the condition [1,2,5].

Detailed history of facial trauma, careful analysis of CT and MRI images, and meticulous management of facial wounds due to trauma can prevent a foreign body from being undetected.

CASE REPORT

A 39-year-old male English teacher complained of persistent and aggravating thin mucopurulent postnasal dripping for more than 3 months. He had suffered from this symptom off and on for 20 years. Physical examination revealed mucopus discharge from bilateral ostiomeatocomplex areas and nasopharynx. Polypoid change was noted in both middle meatus. There was no tenderness over his face. Sinus CAT scan showed spotting opacification over both ethmoid sinuses. A rod-shaped, low density opacification was noted between both orbits across the nasal septum. The facial contour and orbital contents were normal (Fig. 1). ESS was performed to treat his chronic sinusitis. During surgery, we incidentally found a ballpoint pen cap lodged across his nasal septum, between both lamina papyracias (Fig. 2). The patient's sinusitis symptoms disappeared dramatically after surgery. Post-operative follow-up sinoscopy did not reveal residual foreign bodies or polyps. After the ESS procedure, the patient explained that he had encountered facial trauma some 20 years before. A ballpoint pen rod had been stabbed into

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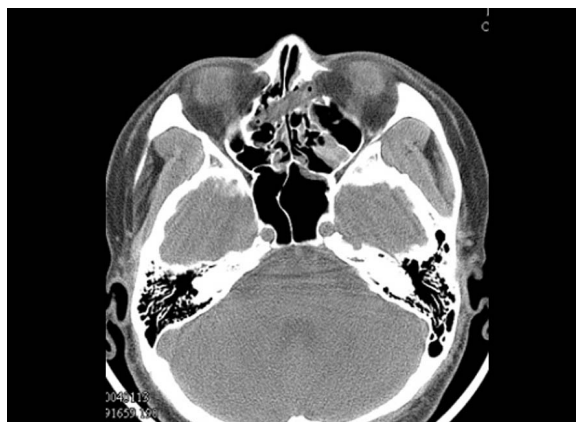


Fig. 1. Sinus CAT scan shows a suspicious foreign-body-like density over bilateral ethmoidal regions.



Fig. 2. A 4 cm × 0.8 cm plastic ball point pen cap foreign body.



Fig. 3. A 8 mm infra-zygomatic facial scar was the entrance of foreign body.

his face through the left zygomatic area (Fig. 3). Unfortunately, although the shaft of the pen had been removed, the cap of the ballpoint pen had not been detected on skull X-ray by his physician (Fig. 4).

DISCUSSION

Long-term retention of a sinus foreign body is uncommon. More than 50% of sinus foreign bodies are located in the maxillary sinus and about 70% of them are associated with maxillofacial trauma. Then others are usually the result of oral surgery procedures. Ethmoid and sphenoid sinus foreign bodies are relatively rare [1,2].

The mechanism of foreign-body-induced-sinusitis is not fully understood. There are some reports of serious sequelae from retained foreign bodies, including sinusitis, cutaneous fistula, rhinolith formation, lead poisoning, meningitis, and chronic facial pain. Sinus malignancy through chronic stimulation of carcinogen from foreign body has also been reported [3-5]. Long-term retention of sinus foreign bodies without sequelae has rarely been reported. It is believed that the change in mucosal function (sterile tissue-air interface) and obstruction of sinus orifice caused by sinus foreign bodies may induce chronic mucosal inflammation or infection [5]. In our patient, the alteration of mucociliary function and obstruction of ethmoid sinus drainage pathways may have contributed to the consequent sinusitis. Although the exact mechanism by which foreign bodies cause sinusitis is unclear, it is thought that sinonasal inflammation due to foreign bodies stimulates granulation, which in turn induces chronic or recurrent sinusitis [1].

The variety of maxillary sinus foreign bodies reported includes retained roots of teeth and fillings, splinters of wood and bamboo, pieces of cotton and gauze, bullets, BB plastic bullets, shrapnel fragments, knife blades, and glass fragments [4]. Residual nasal packing materials have been found weeks to months after operation. This kind of material is hard to identify from sinus CAT and MRI scans. Self-inserted sinus foreign bodies are more likely found in patients with psychosis or major depression [6-8].

Foreign bodies are more frequently found in maxillary sinuses than ethmoid or sphenoid sinuses after maxillofacial trauma [2]. This is because the anterior walls of maxillary and frontal

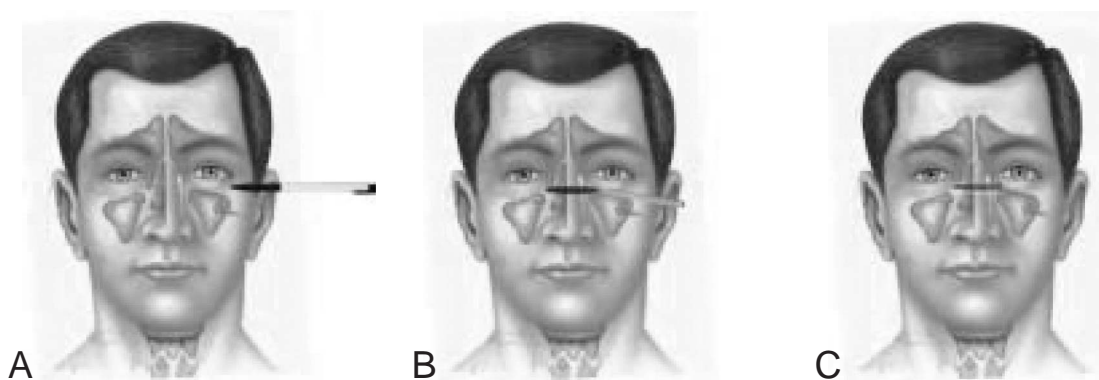


Fig. 4. The penetrating route of sinus foreign body.

sinuses are wider than the others and closer to the surface of maxillofacial skull. Although foreign bodies in the ethmoid and sphenoid sinuses are rare, foreign bodies caused by bullets and metals penetrating the medial canthus have been reported [2]. Ethmoid foreign body via the zygomatic area has not been reported yet.

Determining the wound tract is essential in dealing with penetrating maxillofacial injury. The wound tract of a gun shot injury may not necessarily be straight because of the spiral motion of a bullet. On the contrary, a stabbing injury usually produces a straight wound tract. The extent of trauma can be predicted more precisely by its relative anatomic position [5,9,10]. Different kinds of guns may result in different types of wounds and different extents of trauma. Therefore, we have to consider the type of gun when approaching gun shot injury. The same is true for managing stabbing injury; both the shape of the instrument and angle of penetration must be taken into consideration [5,9,10].

ESS is the treatment of choice for removing sinus foreign body because it is minimally invasive, safe, and results in a smaller surgical wound [1,4,5,8,11]. However, large foreign bodies or those of awkward shape may require external approaches such as Luc's operation [7], craniotomy [2], external ethmoidectomy, mid-facial degloving, or trans-palatal operations to reduce the chance of injuring the surrounding

vital organs during removal [2,7,12]. In certain sphenoid sinus foreign body cases, carotid angiography is needed before foreign body removal to prevent injury to the internal carotid artery. It should also be noted that proper surgical instruments are crucial in removing fragile foreign bodies; improper instrument use may break the foreign body into tiny pieces. Therefore, the consistency and characteristic of the foreign bodies should be considered. Fragile foreign bodies may need to be removed by repeated sinuscopy [1].

Sinus foreign body is a predisposing factor of sinusitis. Foreign body immunological reaction is probably the major mechanism of sinonasal polyposis and sinusitis, although the real mechanism is still not totally clear. For cases of chronic sinusitis with maxillofacial trauma history, detailed trauma history taking and facial scar evaluation should alert the physician to the possibility of retained foreign body. Head and Neck CT and MRI are helpful in diagnosing patients with suspicious sinus foreign body; however, nonmetallic foreign bodies often go undetected in image studies like CAT and MRI [2,13]. Therefore careful imaging study and close follow-up of patients are important in reducing chances of misdiagnosis of sinus foreign body. Sinus foreign body should be removed as early as possible to prevent late sequelae [12]. In most cases, ESS is the first choice to remove sinus foreign bodies because of its minimal

invasiveness and safety. For sinusitis patients with facial trauma history, sinus foreign body should be taken into consideration.

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以慢性鼻竇炎表現之長期篩竇異物

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以慢性鼻竇炎表現之長期篩竇異物相當罕見，本部曾經歷一39歲男性英文老師，主訴近半年來有鼻音加重且合併化膿性鼻涕之情況，理學檢查發現兩側中鼻道呈現息肉樣病變並有化膿之鼻涕，電腦斷層顯示兩側篩竇及上頷竇明顯病變，經鼻竇內視鏡手術意外發現一個4 cm × 0.8 cm之塑膠柱狀原子筆頭穿越鼻中隔橫跨在兩側篩竇間，患者鼻竇炎之情況在異物取出後及門診追蹤治療後大幅改善。回顧病史，病人曾於20年前被同學以原子筆由左顏面部刺入，當時在X光及理學檢查並無明顯體內異物，於是逕行取出筆桿並縫合左顴部傷口，而將原子筆頭遺留在篩竇至今，回顧開刀前之電腦斷層也只隱約找到一個切面有疑似異物，此報告提醒我們在處理顏面外傷患者時，要注意是否有異物存在，本文並對副鼻竇異物侵入之途逕作文獻回顧。(中台灣醫誌 2005;10:159-63)

關鍵詞

鼻竇內視鏡手術，鼻竇異物

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