

## CASE REPORT

**Damla Güçlü Güven<sup>1</sup>**  
**Hüseyin Yaman<sup>1</sup>**  
**Buğra Subaşı<sup>1</sup>**  
**Ender Güçlü<sup>1</sup>**

<sup>1</sup>Düzce University Medical  
Faculty, Department of  
Otorhinolaryngology, Düzce,  
Turkey.

**Corresponding Author:**  
*Dr. Damla Guclu Guven*  
*Düzce University, Medical Faculty,*  
*Department of ENT and Head and*  
*Neck Surgery. Düzce-Türkiye*  
*E-mail: damlaguclu@hotmail.com*  
*Tel: 00903805414107*  
*Fax: 00903805414105*

**Konuralp Tıp Dergisi**  
e-ISSN1309-3878  
konuralptipdergi@duzce.edu.tr  
konuralpgeneltip@gmail.com  
www.konuralptipdergi.duzce.edu.tr

## Fluoroscopy Guided Removal of a Metallic Foreign Body in the Neck: a Case Report

### ABSTRACT

Foreign bodies in the neck are common in the otolaryngology practice. They should be removed as early as possible because many complications such as migration, granuloma formation, recurrent infection, neck abscesses and great vessel ruptures may occur. Different imaging techniques have been described for the localization of metal foreign bodies in the head and neck. Plain radiographs, computed tomography, magnetic resonance imaging and ultrasound may be used depending on the site and composition of the foreign bodies. We present a 26 year old man with a history of one metal foreign body removed in another institute but still having another one that could not be found and removed. Fluoroscopic imaging was used for navigation procedures in the surgery room and the foreign body was removed. Fluoroscopy is a simple and very reliable method for the intraoperative localization of radiopaque foreign objects in the head and neck region.

**Key words:** Foreign Body, Neck, Fluoroscopy

## Floroskopi Yardımıyla Boyundan Yabancı Cisim Çıkarılması: Olgu Sunumu

### ÖZET

Boyun yabancı cisimi vakaları otolaringoloji pratiğinde sık görülmektedir. Migrasyon, granülom oluşumu, tekrarlayan enfeksiyon, boyun absesi, büyük damar rüptürü gibi komplikasyonlara yol açabileceğinden acil olarak çıkarılmaları gerekir. Radyografi, Bilgisayarlı tomografi, Manyetik rezonans görüntüleme ve Ultrason gibi farklı görüntüleme yöntemleri ile boyun yabancı cisimleri tanımlanabilir. Bu vakada dış merkezde boyunda yabancı cisimi çıkarılan ancak ulaşılamayan başka bir yabancı cisimi daha bulunan 26 yaşında bir erkek hasta sunuldu. Ameliyathanede navigasyon amaçlı floroskopi kullanıldı ve yabancı cisim çıkarıldı. Ameliyat esnasında radyoopak yabancı cisimlerin yerinin tespiti için floroskopi etkili ve güvenilir bir yöntemdir.

**Anahtar Kelimeler:** Yabancı Cisim, Boyun, Floroskopi

## INTRODUCTION

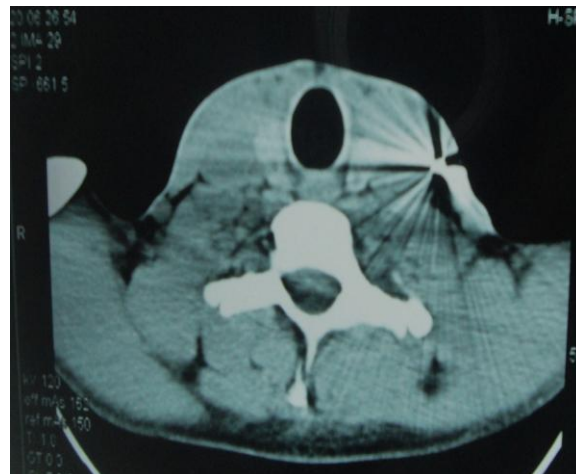
Foreign bodies (FB) of the neck are common in the otolaryngology practice. There are many ways of detecting and localizing FBs. Plain radiographs, computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound may be used. For metal FBs, metal detectors or magnets may be an alternative (1,2). The removal of a FB in the neck has the danger of damaging important anatomical structures. Sharp or metal FBs in the head and neck may introduce a risk of important complications. These are migration, infection, pseudoaneurysm formation, embolization to the central circulation and great vessel ruptures (1,2). Early surgical removal is recommended to avoid the risk of mentioned complications. Even if the exact position of the FB is known from imaging data, the accurate reproduction of this position in the patient's body can be difficult, if the FB is not adjacent to a definite anatomical landmark (3). Identifying a FB in the neck region can sometimes be very difficult. We used intraoperative fluoroscopy as an alternative method to find the exact localization of a neck FB in a challenging case.

## CASE REPORT

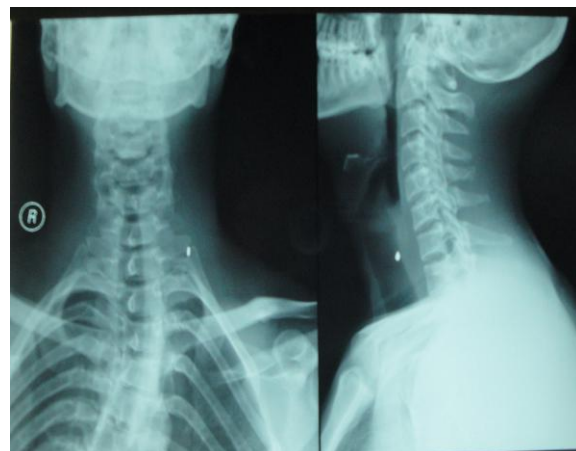
A 26 years old man was referred to our department with a history of metal FB in the neck. The patient had been working on a metal that skipped and then got stuck up in the neck on the left side. He immediately attended an institute where his wound was opened with an incision 4 cm below the ramus of mandible, parallel to the skin plies. A metal foreign body approximately 5mm in length and 2mm in width had been removed. But depending on the patient's complaint of pain, a CT was applied. CT revealed a smaller metal foreign body in the left side of the neck (**Figure 1**) but it could not be palpated and seen intra-operatively. The patient was routed to our department for further treatment.

He presented with a neck incision scar of 2cm in the submandibular region. He had pain in the neck with neck movements. On the video-laryngoscopic examination no intra-luminal foreign body was seen. The soft tissue X-ray and antero-superior view examinations revealed a metal FB at the level of 6th and 7th cervical vertebrae anterior to the left thyroid lamina (**Figure 2**). However the FB could not be palpated. In the surgery room another skin incision posterior and parallel to the previous incision on the sternocleidomastoid muscle (SCM) over the clavicle was made. A skin flap with platysma was elevated and the SCM was explored. The SCM muscle fibers were dissected through and the FB was tried to be palpated. Dissection was continued until the vascular-nervous bundle (common carotid artery, jugular vein and vagus nerve) was seen but the foreign body could not be seen or palpated. A small magnet was used to

attract the FB and it was kept all over the opened incision, but the FB did not hold the magnet.



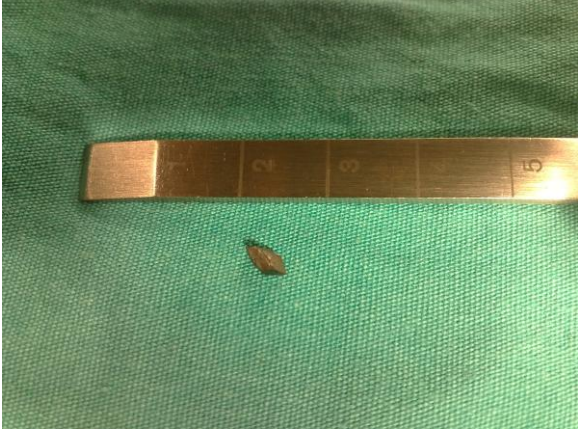
**Figure 1.** CT scan of the metal foreign body in the left side of the neck.



**Figure 2.** The soft tissue X-ray and antero-superior view examinations of metal FB at the level of 6th and 7th cervical vertebrae anterior to the left thyroid lamina



**Figure 3.** The fluoroscopic view of the foreign body when the clamps are placed.



**Figure 4.** The metallic foreign body after removal.

Finally fluoroscopic examination was tried. The fluoroscopic view proved that the FB was still in the same localization. Two clamps with different shapes which are accepted as reference markers were placed sporadically and fluoroscopic view was taken. The approximate position of the FB was determined. By replacing the clamps around this site, an area of 2 cm<sup>2</sup> remained around (**Figure 3**). By palpating this area and dissecting the SCM fibers definitely, a metal FB 4mm in length and 2mm in width was found (**Figure 4**). There was no damage to any adjacent vascular structure.

#### **DISCUSSION**

FBs of the neck are common and their removal is important because many complications such as migration, granuloma formation, recurrent infection, neck abscesses, hemorrhage, hematoma and great vessel ruptures may occur (1,2). But many times identifying the FB is hard and the removal of the FB in the neck has a risk of damaging the important anatomical structures of the head and neck (3). A few cases have been reported in the literature about migratory foreign bodies and they all support early mandatory exploration (2). Khan et al (4) presented a case of 1cm metallic foreign body in the neck at the level of the thyroid cartilage which was migrated in to the trachea. Rodriguez (5) reported a case of 1cm metallic rod in the right cervical region which was perforated the internal jugular vein and embolized to the heart. Ahmad et al (6) presented a foreign body in the neck which migrated deep into the

retropharyngeal/parapharyngeal spaces during the initial exploration. Khan et al (4) recommended that especially if there has been a delay in surgical intervention, repeated X-rays should be undertaken immediately prior to exploratory procedures in the neck. Different imaging techniques have been used for describing head and neck region foreign bodies. Plain radiographs, MRI, ultrasound, CT, navigation system are the ways for detecting foreign bodies (3). Also metal detectors and magnets have been used for detecting and localizing FBs (1,3). Plain radiographs, 2 views at right angles to each other can provide a three dimensional (3-D) seeing (7). But plain radiography is sometimes of limited value in finding the localization of the FB (8). Although we had antero-posterior and lateral views in our patient, the radiographs did just helped to estimate the approximate localization. CT is an imaging technique which can provide also a 3-D localization of the metal neck FB (7).

Although the CT scan gives more information about the localization, it cannot provide useful information during the surgery because of the probability of the displacement of the foreign body. Cone-beam CT, CT-arm systems and ultrasound can also be used for the same purpose. But in many clinics and in the surgery room these systems are not available. They are also expensive and time consuming. The ultrasonographic examination needs direct contact to the surgical procedure field and has a risk of contamination. MRI is a way to localize the FB but it has risks of moving the FB due to its strong magnetic field that can cause fatal damages and it is not appropriate in the head and neck region because of the close relations of the great vessels (7).

Metal detectors have been used by otolaryngologists, radiologists and trauma surgeons to look for bullets and missile shrapnel and swallowed metal objects. It has a success in the accuracy for coins and watch batteries. However it failed to identify non disc-shaped items (9). Magnets also cannot attract all types of metals as happened in our case.

The fluoroscopy guided procedure can be used as a simple, effective and reliable way of finding the localization, removing the FB of neck and reducing the risks of damaging anatomical structures during the surgical removal.

**REFERENCES**

1. Mathai J, Ahmed S, Pushpakumari KP, Reynolds AJ. Removal of a Metallic Foreign Body in the Neck with a Magnet: a case report. *Indian J Otolaryngol Head Neck Surg* 2007;59(6):382-3.
2. Islam S, Esmil T, Umapathy N, Hoffman GR. Foreign body (metal key) impacted in the upper neck. *Injury Extra* 2007; 37(3):109-12.
3. Eggers G, Haag C, Hassfeld S. Image Guided Removal of Foreign Bodies. *J Oral and Maxillofac Surg* 2005;43(5):404-9.
4. Khan MS, Kirkland PM, Kumar R. Migrating foreign body in the tracheobronchial tree: an unusual case of firework penetrating neck injury. *J Laryngol Otol* 2002;116(2):148-59.
5. Rodriquez Gomez E. Cervical foreign body. An unusual case. *Acta Otorinolaringol Esp* 2004;55(6):298-301.
6. Ahmad R, Pampori RA, Wani AA et al. Transcervical foreign body. *J Laryngol Otol* 2000;114(6):471-82.
7. Stockmann P, Vairaktaris E, Fenner M et al. Conventional radiographs: are they still the Standard localization of projectiles? *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007;104(4):e71-e75.
8. Wu IS, Ho TL, Chang CC, Lee HS et al. Value of Lateral Neck Radiography for Ingested Foreign Bodies Using the Likelihood Ratio. *J Otolaryngol Head-Neck Surg* 2008;37(2):292-6.
9. Muensterer OJ, Joppich I. Identification and Topographic Localization of Metallic Foreign Bodies by Metal Detector. *J Ped Surg* 2004;39(8):1245-8.