Case report

Foreign body removed by the ‘Fire and Ice Technique’: A case report

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ABSTRACT

With the introduction of flexible bronchoscopies, several techniques and accessories have been available for the removal of foreign bodies (FB). However, in some cases, using conventional techniques are inappropriate and fail to remove the FB. Here we report a case of a 33-year-old male with 19 years foreign body aspiration history. A successfully removal of the ingrown FB was achieved by means of an argon plasma coagulation and a flexible cryoprobe.

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1. Introduction

Missed or delayed diagnosis of an aspirated foreign body (FB) can result in respiratory distress ranging from life-threatening airway obstruction to recurrent pneumonia [1]. Bronchoscopy plays a fundamental role in the therapeutic procedure for FB, but the use of argon plasma coagulation (APC) in combination with cryoprobe, which we refer to as ‘Fire and Ice Technique’, has not been reported for FB removal so far. Here, we show a FBA case in which the FB was extracted by means of a flexible bronchoscopy along with APC and the use of a cryoprobe.

2. Case report

A 33-year-old male patient was referred to our department due to episodes of productive coughing and chest pain, lasting over 19 years. A bronchoscopy after the aspiration revealed two small pieces of a toy trumpet that were formerly extracted successfully. He continued to cough with yellow sputum and also reported dull pain in the right chest. After a therapy with multiple courses of antibiotics the symptoms improved only partially. A chest CT-Scan (Fig. 1A) and a following flexible fiberoptic bronchoscopy (Olympus Japan, Inc.) revealed a foreign body embedded in the right intermediate bronchus (Fig. 1B) that could not be remove by a forceps (Olympus Japan Inc.). Under general anesthesia, APC coagulation (Erbe-Elektromedizin GmbH, Germany) was performed by 1 L/min gas flow and 45 W in forced APC mode allowing removing the granulation tissue around the FB. Thereafter, we used a flexible cryoprobe (ErbeElektromedizin GmbH, Germany) for a final extraction of the FB by placing the cryoprobe’s tip on the remaining granulation tissue surrounding the foreign body and activate freezing for 10 s. Whilst still frozen, the cryoprobe, together with the bronchoscope and the FB was retracted (Fig. 1E). No severe bleeding was observed. A follow up CT-Scan and re-bronchoscopy showed no remaining foreign body in the right intermediate bronchus (Fig. 1C).

3. Discussion

When symptoms of FBA [2] are minimal, the aspiration may go unnoticed, leading to a delayed or omitted diagnosis, as happened in our case. Therefore, even after the removal of a FB a second look is recommended to further evaluate the extraction of the FB. Forceps are a good choice for the removal of small, superficial inorganic FB but can rarely be used for big, organic or ingrown objects as in our case [3]. Therefore, we used first APC to expose the FB from the surrounding tissue and second subsequently extract the FB by means of a cryoprobe.

APC is ideal e.g. for coagulation of superficial hemorrhagic lesions or for the destruction of benign or malignant tissue. After
ablation of the superficial tissue by means of the APC, we tried to remove the FB with a forceps, but failed.

In contrast, Jabbarjani et al. could remove a FB using APC and a conventional forceps because of a shorter period of time following aspiration and the less ingrown of the FB [4]. Here, we achieved the extraction of the FB by the use of a flexible. Several studies have reported the successful removal of foreign bodies and other stenosis using flexible cryoprobe also demonstrating the superiority of cryoprobe in comparison to the use of forceps during [2,5].

In conclusion, when patients are hospitalized with typical symptoms of foreign-body aspiration we recommend a radiography and/or bronchoscopy as a first diagnostic step. The use of the ‘Fire and Ice Technique’ is useful and can help in the intervention for foreign body removal with overgrown granulation tissue caused by a prolonged length of time following the aspiration. This might prevent patients from an unnecessary surgical procedure and might save costs.

**Conflict of interest**

None.

**References**

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