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Case Report / Приказ болесника

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Foreign body aspiration misdiagnosed as asthma – a case report and literature review

Аспирација страног тела погрешно дијагностикована као астма – приказ болесника и преглед литературе

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Аспирација страног тела погрешно дијагностикована као астма – приказ болесника и преглед литературе

SUMMARY

Introduction Foreign body aspiration (FBA) is a rare, but potentially life-threatening event occurring most commonly in children and older adults. The clinical presentation of occult FBA in adults is usually subtle, manifesting as chronic cough, wheezing and exertional dyspnea. A delay in diagnosis is not uncommon for weeks, or even months due to subtlety of symptoms. Direct visualization via bronchoscopy continues to be the gold standard for diagnosing and treating FBA. In this report, we present a case of a man treated for five years having difficult-to-treat asthma with unnoticed tooth aspiration.

Case outline A 63-year-old non-smoker male patient was referred to the Clinic of Pulmonology, University Clinical Center of Serbia, with chief complaints of dyspnea and chronic cough over the course of five years. He sought medical help several times and was diagnosed and treated as late-onset bronchial asthma, which failed to improve even with optimized therapy. A high-resolution CT scan was performed, which showed a calcified body in left main bronchus measuring 16x13mm, which was later extracted via flexible bronchoscopy. There was immediate symptom relief after the extraction. Pulmonary function tests after the procedure showed no bronchial obstruction, with negative bronchodilation test.

Conclusion A difficult-to-manage asthma requires a thorough workup to rule out alternative diagnoses. Foreign body aspiration, even though rare occurrence in adults without obvious risk factors, must be considered to prevent long term complications.

Keywords: asthma; foreign body aspiration; bronchoscopy

САЖЕТАК

Увод Аспирација страног тела је ретко, потенцијално животно угрожавајуће стање које се најчешће догађа код деце и старијих особа. Клиничка слика окултне аспирације страног тела је најчешће суптилна, са неспецифичним симптома попут хроничног кашља, визинга и интолеранције напора. Постављање тачне дијагнозе се неретко одлаже недељама, понекад и месецима услед неспецифичних симптома. Бронхоскопски директна визуелизација и екстракција представља златни стандард у дијагнози и терапији аспирације страног тела. Приказујемо случај болесника који је 5 година лечен као тешка астма са недијагностикованом аспирацијом зуба.

Приказ случаја Болесник стар 63 године, непушач, упућен је на Клинику за пулмологију Универзитетског клиничког центра Србије, са главним тегобама у виду отежаног дисања и хроничног кашља које трају 5 година уназад. Прегледан је од стране лекара у више наврата, након чега је постављена дијагноза бронхијалне астме са касним почетком, међутим није имао побољшање упркос максимално оптимизованој терапији. Учињен је скенер високе резолуције грудног коша на коме је уочено калцификовано тело у лумену левог главног бронха димензија 16 × 13 *mm*, које је накнадно извађено флексибилном бронхоскопијом. Одмах након вађења је дошло до побољшања симптома. Тестови плућне функције учињени након процедуре су били без бронхоопструкције, са негативним бронходилатацијским тестом.

Закључак Пре постављања дијагнозе тешке астме, неопходно је учинити детаљно испитивање свих алтернативних дијагноза. Аспирација страног тела, иако је ретко стање код одраслих, без јасних фактора ризика, мора бити узето у разматрање при диференцијалној дијагнози ради спречавања дуготрајних компликација.

Кључне речи: астма; аспирација страног тела; бронхоскопија

INTRODUCTION

Foreign body aspiration (FBA) is a rare, but potentially life-threatening event occurring most commonly in children and older adults [1]. Adult patients frequently have underlying risk factors for aspiration, such as altered mental status, alcohol or drug intoxication, and neuromuscular weakness [2].

The clinical presentation of occult FBA in adults is usually subtle, manifesting as chronic cough, wheezing, exertional dyspnea or hemoptysis. A delay in diagnosis is not uncommon for weeks, or even months due to subtle symptoms [3]. In adults, aspiration occurs most commonly in the right bronchial tree [4]. These patients are frequently misdiagnosed as having pneumonia or difficult-to-treat asthma [5]. Direct visualization via bronchoscopy continues to be the gold standard for diagnosing and treating FBA [6].

In this report, we present a case of a man treated for five years as having difficult-to-treat asthma with unnoticed tooth aspiration.

CASE REPORT

A 63-year- old non-smoker male patient was referred to the Clinic of Pulmonology, University Clinical Center of Serbia, with chief complaints of dyspnea and chronic cough over the course of five years. He sought medical help several times and was diagnosed and treated as late-onset bronchial asthma with high doses of inhaled corticosteroids/long-acting beta-2 agonists, and underwent multiple courses of antibiotics. During this period, the patient underwent routine laboratory tests, which did not reveal clinically significant abnormalities. While he received multiple courses of antibiotics for presumed respiratory infections, these were prescribed empirically based on clinical symptoms, without alarming laboratory findings, and no chest radiography was performed at that time. Even with optimized asthma therapy, there was no clinical improvement.

Medical history was negative for other illnesses. Subsequently, the patient reported blood-streaked sputum in the last two months. He was admitted to our clinic for further evaluation. On physical examination performed by a pulmonologist, he was eupneic, oxygen saturation was 98%, and there were no obvious signs of bleeding diathesis. On auscultation, unilateral left-sided wheezing was noted with decreased breath sounds. Chest X-ray showed a focal consolidation of the left lower lobe (Figure 1). A high-resolution CT (HRCT) scan was performed, which showed a calcified body in the left main bronchus measuring 16 x 13mm with surrounding mucosal inflammation (Figure 2). A detailed medical history was retaken, during which he reported that approximately five years prior to presentation he woke up without a tooth (an incisor), which had previously undergone a dental procedure. Except for leukocytosis (13.7 x 10^3/mm) and elevated C-reactive Protein (53 mg/L), all laboratory parameters were normal. Flexible bronchoscopy via the transoral route was performed under local anesthesia. The entrance of the left main bronchus was found to be stenotic. Lodged in the middle part of the left

main bronchus, a bony foreign body was observed just below the level of central carina with surrounding granulation tissue and signs of post-obstructive pneumonia – edematous mucosa with mucopurulent secretions (Figure 3). Mechanical extraction was performed using alligator forceps, and the foreign body was identified as a tooth approximately 20 mm in length (Figure 4). Extraction combined with partial removal of granulation tissue and secretion resulted in immediate symptom relief. Pulmonary function tests after the procedure showed no bronchial obstruction, with negative bronchodilation test. Bronchial washings taken for Gram and Ziehl-Neelsen staining and cultures were negative. Control bronchoscopy was performed after three days, which showed small amounts of remaining granulation tissue (Figure 5). The patient was discharged and remained asymptomatic on routine follow up. A control HRCT done after two weeks showed no signs of foreign body.

Ethics: Principles of the Declaration of Helsinki were respected in this case report. Written informed consent was obtained from the patient for publication of this case report and any accompanying images. All identifying details have been removed or anonymized to ensure patient privacy.

DISCUSSION

FBA is a medical emergency that necessitates prompt diagnosis and treatment [7]. A recent global epidemiological assessment demonstrated that foreign body aspiration (FBA) remains relatively infrequent overall, with a notably lower incidence in adult populations over recent decades despite ongoing cases being documented across age groups [8]. In contrast, another study yielded different results, demonstrating that FBA is frequently misdiagnosed as other respiratory diseases, including asthma, chronic obstructive pulmonary disease, recurrent pneumonia, and bronchiectasis [6, 9, 10], similar to what has been found in our case report. We do not have precise data on the incidence of foreign body aspiration in our institution. Roughly, around 12 cases are diagnosed over a six-month period. Being a large referral center, we encounter a relatively high number of foreign bodies. Also, this was the first case in our experience of a misdiagnosed foreign body aspiration involving a tooth. According to the newest guidelines, difficult-to-treat asthma is defined as asthma that is uncontrolled even with high-dose inhaled glucocorticoids and a second controller therapy [11]. Walker et al. highlighted the significant clinical utility of HRCT in severe asthma evaluation [12]. In our case, the patient had been using high dose inhaled glucocorticoids and met the criteria for difficult-to-treat asthma,

but never underwent a HRCT for further evaluation. This highlights why it is crucial to maintain a high clinical suspicion for alternative diagnoses when treating difficult-to-treat asthma with a poor response to therapy. A study from 2020 showed that common reasons for poor response to asthma therapy are incorrect inhalation technique and poor patient adherence [13]. Although rare and commonly overlooked in adults, another possible differential diagnosis is occult FBA [6]. Among the most commonly aspirated objects are meat, nuts or fish bones, as previous data suggest [14]. By contrast, in a recent multicenter study, the most common object aspirated among adults is a tooth, as increasing number of people undergo dental treatment. Psychiatric and neurological diseases, severe trauma, alcoholism, sedative use, poor oral hygiene, and advanced age are all risk factors for foreign airway bodies in adults [8]. Our patient didn't have any obvious risk factors, which suggests the importance of encompassing FBA in the differential of other pulmonary diseases. Symptoms associated with FBA can sometimes be non-specific, and include cough, dyspnea, wheezing, stridor, hemoptysis [15]. A study from 2023 pointed out that clinical presentation of FBA varies depending on the level of obstruction and the duration of foreign-body retention in the tracheobronchial tree. In patients with occult FBA, the impacted foreign body is generally small and tends to lodge distally within the airways, leading to chronic respiratory symptoms [16]. Diagnosis of a FBA can be challenging, especially when it presents with chronic, nonspecific respiratory symptoms as it did in our patient. According to Bhatti et al, a delay in the diagnosis of FBA can lead to complications such as recurrent pneumonias, bronchiectasis, recurrent hemoptysis and lung abscesses [17]. Initial step in diagnosing FBA is most commonly a chest X-ray, which can be useful, however, it's limited in specificity, as the overlaying of the mediastinal structures can obscure it [18]. A high index of suspicion should be kept of FBA if there are secondary changes on chest x ray, such as atelectasis or obstructive pneumonia [15]. Unlike the chest X ray, HRCT has a reported sensitivity of 100% for detecting a foreign body, and a specificity of 66.7% according to one comparison study [19]. In our case, where the correct diagnosis was delayed, an earlier HRCT would have been crucial for prompt treatment.

Bronchoscopy has an established role in treating FBA [20]. There is no clear protocol regarding the type of initial bronchoscopy used for treating FBA. Literature data from a cohort study report the success rate of 98% with flexible bronchoscopy, of which 75% of the cases were achieved by a single procedure, and 25% of the cases needing more than two procedures. In the same study, formation of granulation tissue was observed in 44% of the cases [21]. In a large study consisting of 25,998 adult patients who inhaled foreign body, treatment option with

flexible bronchoscopy was associated with lower rates of morbidity and mortality compared with rigid bronchoscopy, as general anesthesia is avoided [22].

Recent studies highlight that flexible bronchoscopy can be enhanced with adjunctive tools such as baskets, snares, and electrocautery to improve extraction success, especially in complex or chronically retained foreign bodies, underscoring the evolving role of technique adaptation in adult airway management. [23]

Rigid bronchoscopy can be used as a backup option if flexible bronchoscopy is unsuccessful [3]. Recent data demonstrate that when flexible bronchoscopy fails to retrieve certain airway foreign bodies, particularly those that are large or difficult to grasp, rigid bronchoscopy is frequently employed successfully as a complementary intervention — highlighting its continued importance in complex adult cases. [24]

For our patient, flexible bronchoscopy with forceps extraction was sufficient for complete removal of foreign body.

In conclusion we can say that a difficult-to-manage asthma requires a thorough workup to rule out any alternative diagnoses. Foreign body aspiration, even though a rare occurrence in adults without obvious risk factors, must always be considered to prevent long-term complications.

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Conflict of interest: None declared.

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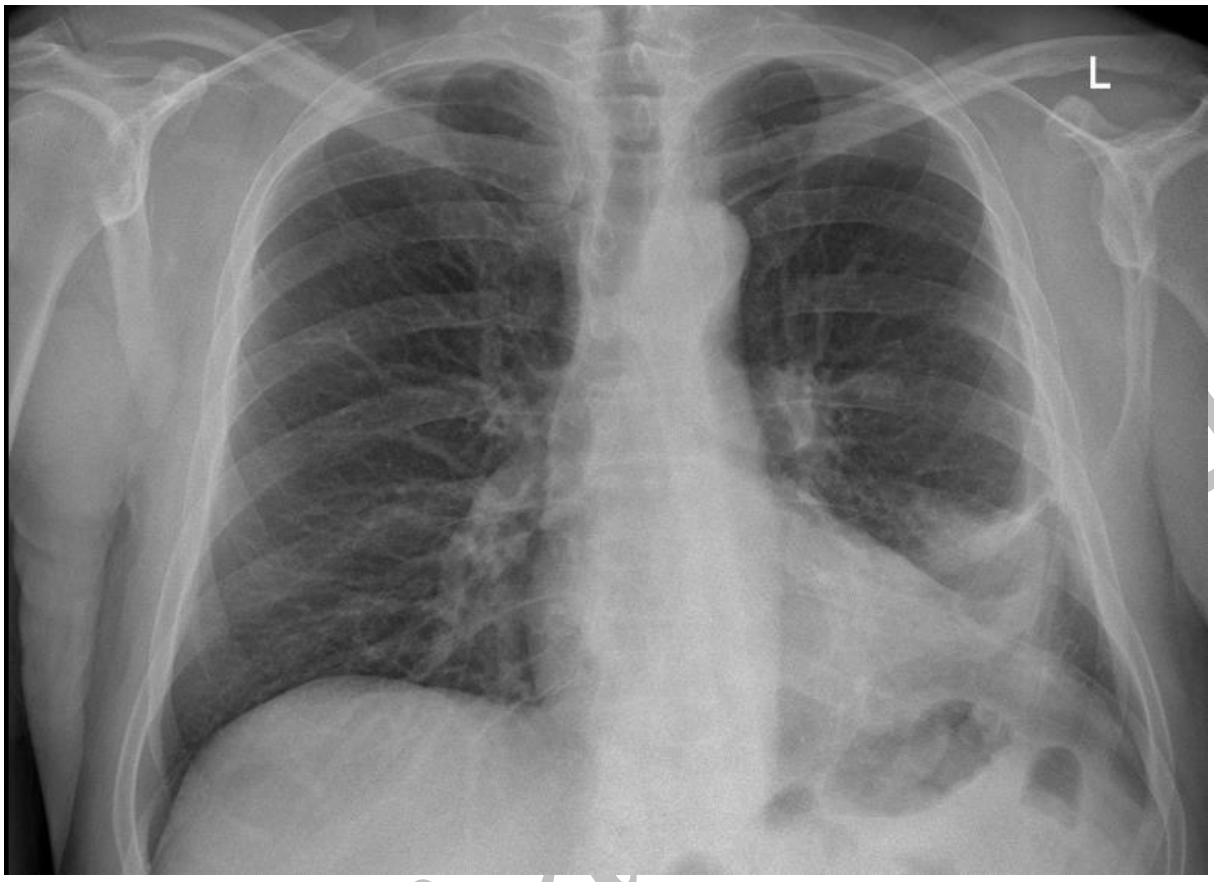

Figure 1. Chest X ray showing a focal consolidation of the left lower lobe

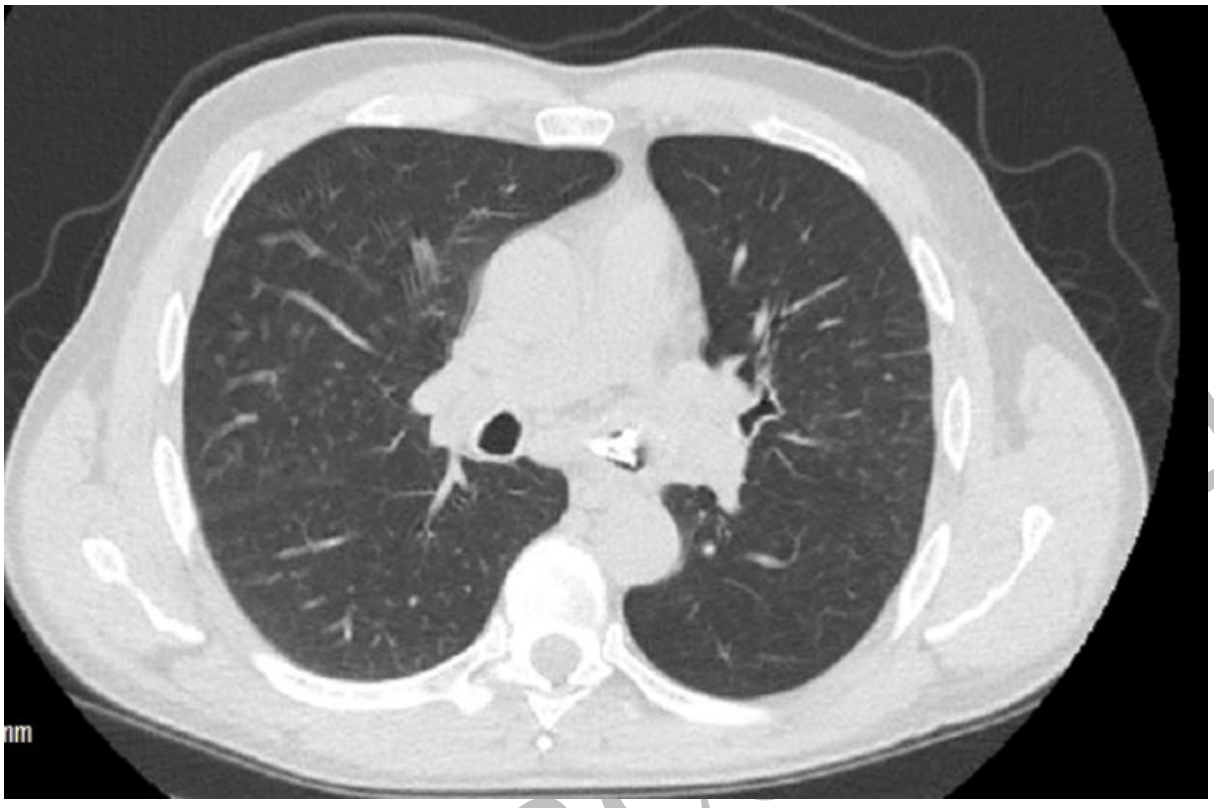

Figure 2. High-resolution CT of the lungs showing a calcified body in left main bronchus

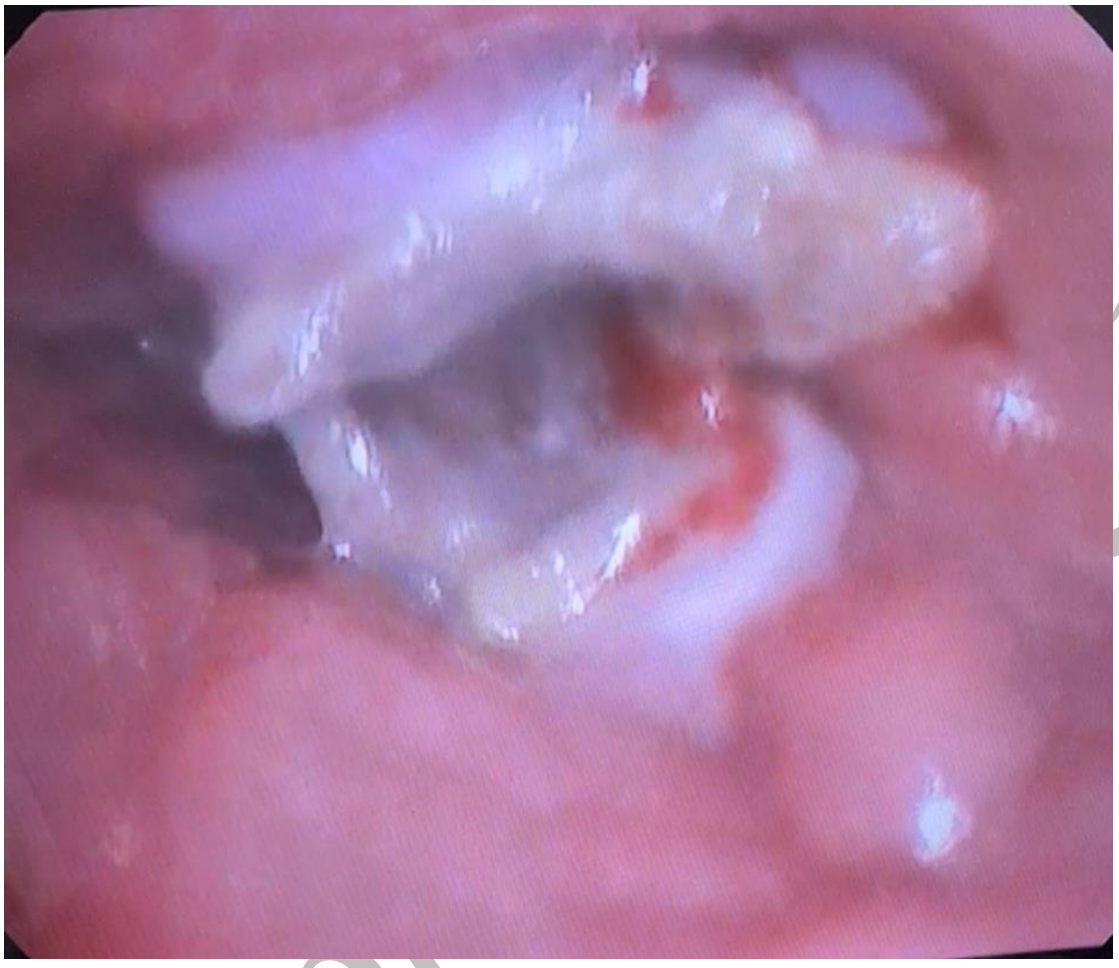

Figure 3. Bony foreign body in the left main bronchus with surrounding granulation tissue and signs of post-obstructive pneumonia

Figure 4. Extracted tooth

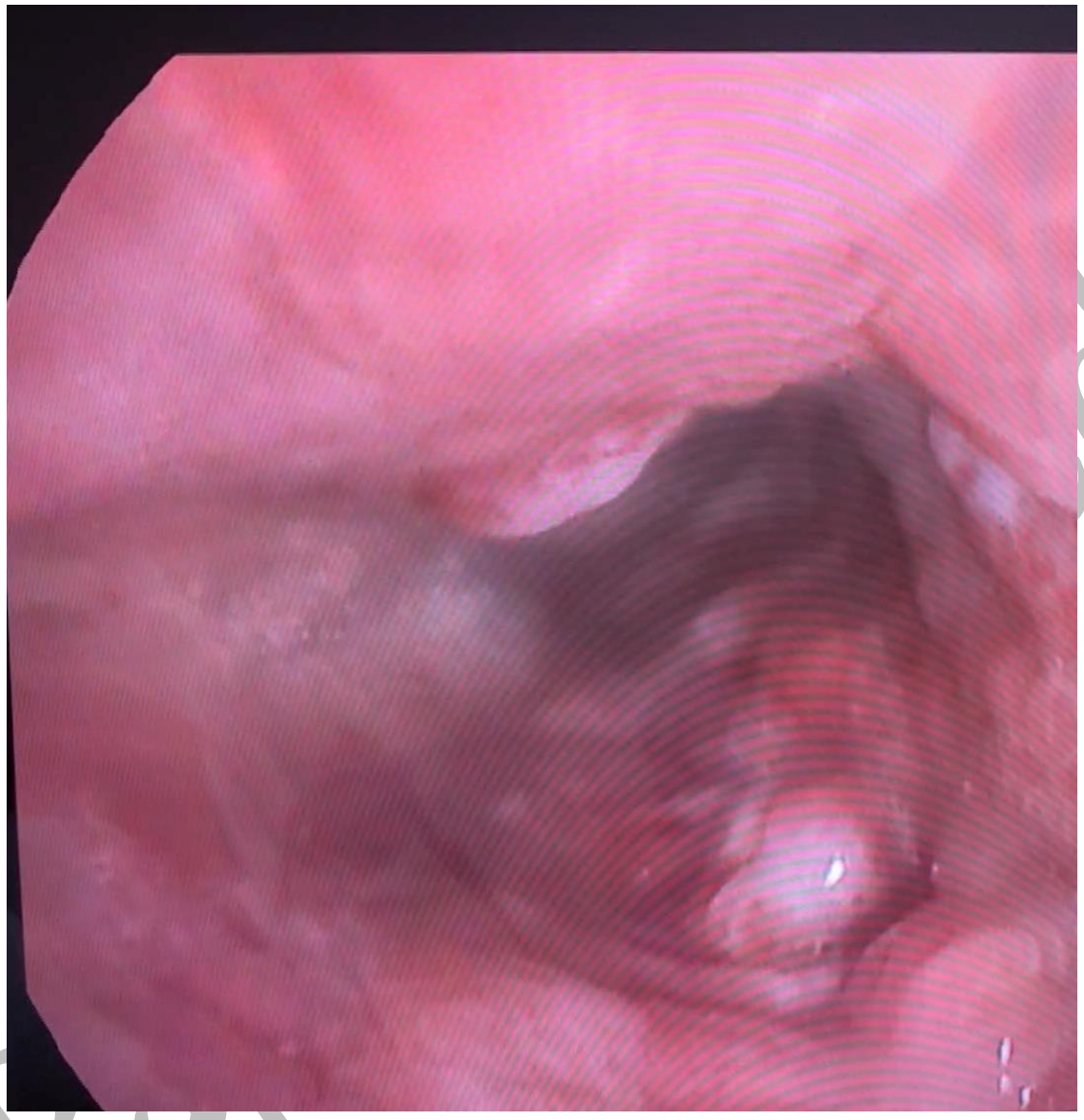

Figure 5. Control bronchoscopy after the extraction, showing small amounts of remaining granulation tissue

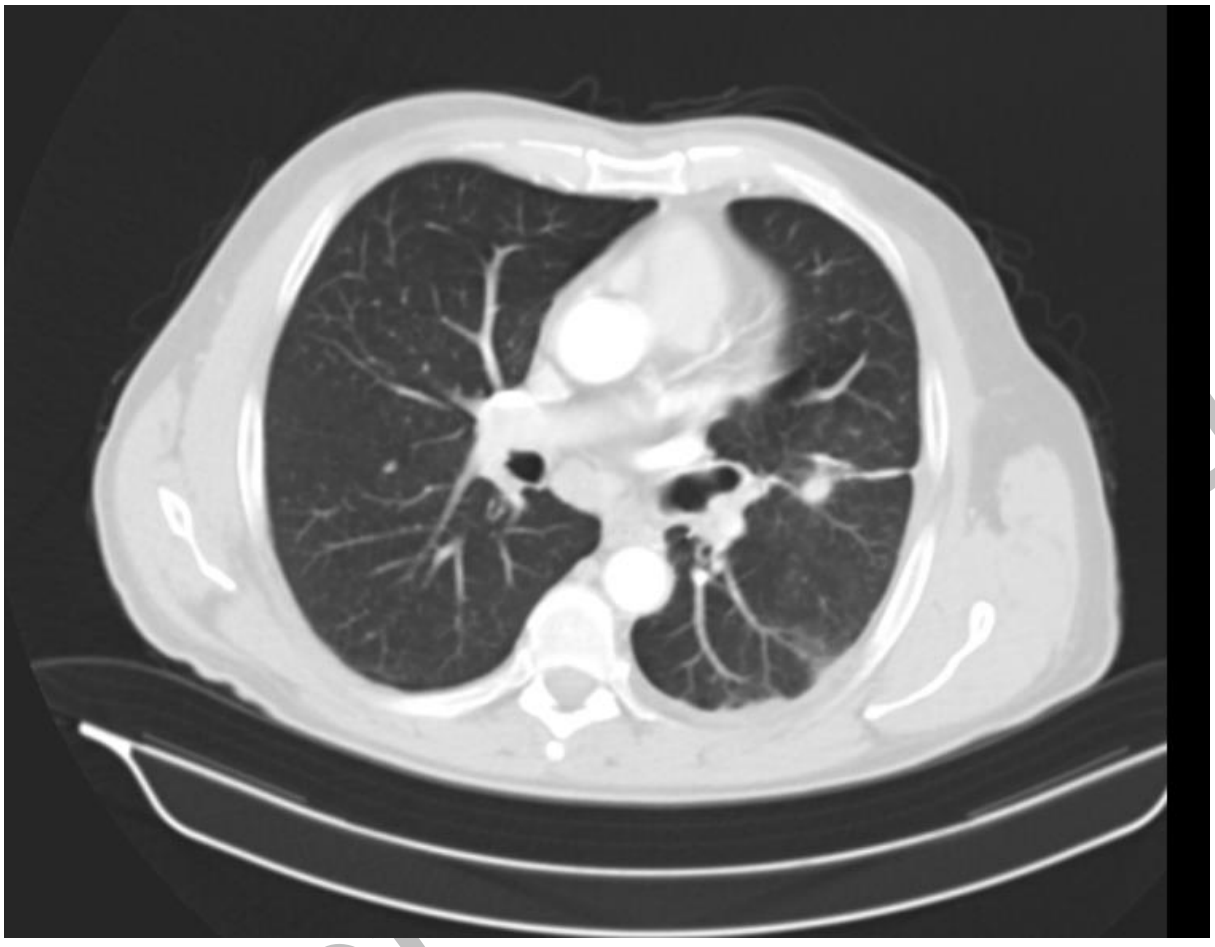

Figure 6. Control high-resolution CT done after two weeks showed no signs of foreign body

