

# Aspiration and accidental bronchography as a complication of radiotherapy

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## ABSTRACT

In patients with head and neck cancer, functional oropharyngeal dysphagia and tracheobronchial aspiration are potential aftereffects of radiotherapy (RT). Likewise, recurrent aspiration is a known cause of bronchiectasis and aspiration pneumonia. However, the signs and symptoms of dysphagia or aspiration may not be clinically obvious, and a high index of suspicion must be born in mind and elicited from the clinical data. Here we present a male with unnoticed recurrent aspiration as an aftereffect of neck RT, discuss our clinical management, and comment on the related literature.

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## Broncoaspiración y Broncografía Accidental como Secuela de Radioterapia

## R E S U M E N

En los pacientes con cáncer de cabeza y cuello, la disfagia orofaríngea funcional y la aspiración traqueobronquial son posibles secuelas de la radioterapia (RT). Asimismo, la aspiración recurrente es una causa conocida de bronquiectasias y neumonía por aspiración. Sin embargo, los signos y síntomas de disfagia o aspiración pueden no ser clínicamente evidentes, por lo que hay que tener presente un alto índice de sospecha y obtenerlo a partir de los datos clínicos. Aquí presentamos a un varón con aspiración recurrente inadvertida como secuela de una RT de cuello, discutimos nuestro tratamiento clínico y comentamos la literatura relacionada.

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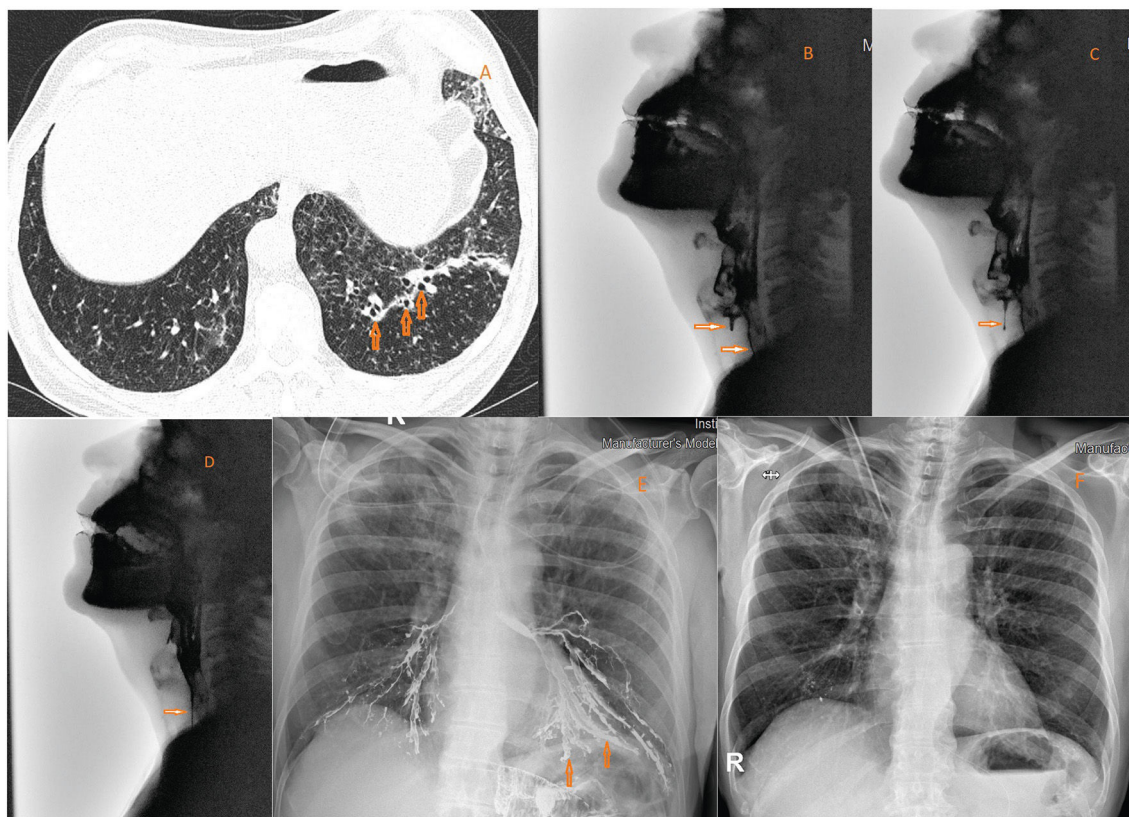
## To the Director,

A 64 year-old male was admitted to the pulmonary ward due to 6 months of cough and purulent sputum, intermittent chills, fever, and progressive dyspnea. He reported a 15 kg. unintentional weight loss within that period. Six years earlier, a diagnosis of nasopharyngeal carcinoma with bilateral cervical lymphadenopathies (pT2bN2M0) was made, for which he received chemo and radiotherapy (RT), and remained tumor-free ever since. Upon examination, he was cachectic, tachypneic, and required supplemental oxygen. Oral xerostomy was noted, and inspiratory crackles were heard over the lower field of the left hemithorax. Few colonies of *Pseudomonas aeruginosa* grew in the sputum, and the HRCT showed localized bronchiectasis (Fig. 1A).

However, despite 2 weeks of adjusted antibiotic therapy, no clinical improvement was appreciated. On further questioning, the patient revealed feeling distressed by a persistent swallowing trouble and cough whenever he ate meat or drank water. Therefore, significant oropharyngeal dysphagia and aspiration were highly suspect. The volume-viscosity swallow test (V-VST) was carried out, which showed fractionated swallowing and pharyngeal residue after 5 ml of nectar and pudding, and a post-swallow cough after 20 ml of nectar and 10 ml of pudding. Subsequently, using a composite texture -somewhat between nectar and cream-, a videofluoroscopic swallowing study (VFSS) was carried out, whereby barium retention at the pyriform sinuses and post-swallow aspiration without cough were observed. In fact, tracheal aspiration was so evident that prompted the cancellation of the procedure (Fig. 1B–E, Video). Fortunately, the patient did not report increased dyspnea, and no change in breathing frequency or arterial oxygenation were noticed. He agreed to be fed through a nasogastric tube while

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**Fig. 1.** A. HRCT, axial image: Cylindrical bronchiectasis (arrows) and a patchy infiltrate in the left lower lobe are seen. Multiple micronodules suggestive of cellular bronchiolitis are noted in the lower lobes, especially in the left lung. B–D. VFSS. The patient tilts his head upwards to attempt swallowing. Tracheal aspiration of barium sulfate is evident (arrows). E. Chest x ray obtained the same day shows accidental bronchography caused by aspiration of barium. The arrows point to the bronchiectasis. F. Follow-up chest x ray within 1 week shows clearance of the barium in the airway.

awaiting to undergo the placement of a percutaneous gastric tube. Eventually, oxygen therapy could be withdrawn (Fig. 1F). As a note of interest, the patient reported the habit of sleeping on his left side, which could explain the bronchiectasis in the left lung caused by recurrent aspiration. Respiratory physiotherapy and speech therapy were subsequently scheduled, being the final diagnosis severe oropharyngeal dysphagia and cylindrical bronchiectasis due to recurrent aspiration, all as an aftereffect of head and cervical RT.

The prevalence of oropharyngeal dysphagia and aspiration after RT for head and neck cancer has been previously reported. In a cohort of 324 patients, Mortensen et al. found that 32 % of them developed severe dysphagia and 5% developed pneumonia, all within the first year after RT<sup>1</sup>. In a cohort of 118 patients studied by VFSS, Langerman et al found that 25 % of them developed frank aspiration defined as aspiration of more than 5% of the total volume of barium, and most of them did not report prior coughing or choking when swallowing. These patients were also studied within the first year after RT<sup>2</sup>.

The instrumental assessment of swallowing dysfunction relies on various image studies, namely VFSS and fiberoptic endoscopic evaluation of swallowing (FEES). As for barium sulfate, low-density suspensions were used in the past for bronchography, and it was considered safe. However, Li et al. argue against accepting barium sulfate as an innocuous agent, and compile 22 case reports of respiratory complications after accidental barium aspiration, out of whom 10 patients died. They claim that large amounts of this compound have the potential to cause respiratory distress<sup>3</sup>. Compared to VFSS, FEES may be more sensitive detecting penetration and aspiration, and the amount of aspirated material might be smaller and without major adverse effects. However,

current recommendations do not clearly favor one method over the other<sup>4,5</sup>.

In our case, in view of the patient's respiratory failure, it is possible that FEES would have been preferred to VFSS, but the former was not readily available. Dysphagia can occur many years after the completion of RT, even in patients without dysphagia during treatment or in the immediate aftermath. This seems to be more common in patients treated with concurrent chemotherapy, although it is difficult to predict who will develop late swallowing complications. As noted, this may be compounded by potential unawareness on the patient's side<sup>4</sup>. In our center, an outpatient nutritional assessment for patients with head and neck cancer submitted to RT has been recently established, so we hope that in the future, similar cases will be picked up earlier.

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### Conflict of interest

The authors of the manuscript titled "Aspiration and Accidental Bronchography as a Consequence of Radiotherapy" declare not to have any conflicts of interest.

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