Internal Medicine
The Japanese Society of Internal Medicine
doi: 10.2169/internalmedicine.6052-20
Intern Med 60: 3285-3287, 2021
http://internmed.jp

【 CASE REPORT 】

A Need for a Diagnostic Management Protocol in Barium Aspiration

Yuki Yoshimatsu[1,2], Kazunori Tobino[1,3], Ryunosuke Ooi[1], Takuto Sueyasu[1], Saori Nishizawa[1], Kohei Yoshimine[1], Yuki Ko[1], Hiromi Ide[1] and Kosuke Tsuruno[1]

Abstract:

We experienced a patient who presented with lung abscess one month after aspirating barium during a gastric cancer screening examination. The patient had no subjective symptoms suggesting a swallowing disorder. Rigorous history taking under suspicion of aspiration and a further assessment of the cause of aspiration revealed hypopharyngeal cancer. Lung abscess and hypopharyngeal cancer, both treatable but potentially fatal conditions, were not diagnosed until one month after the aspiration. This highlights the need for guidance for patients and physicians to follow in the event of barium aspiration, as it is the most common complication of a barium examination. A health checkup for one condition (gastric cancer) may also be an opportunity to diagnose another underlying condition.

Key words: aspiration pneumonia, dysphagia, gastric cancer, pharyngeal cancer, swallowing disorder

(Intern Med 60: 3285-3287, 2021)
(DOI: 10.2169/internalmedicine.6052-20)

Introduction

Upper gastrointestinal imaging using barium sulfate is a routinely performed method of screening for gastric cancer in Japan. Its most common complication is aspiration (1), and elderly patients over 70 years old have a 10-fold greater risk than younger patients. Efforts to prevent aspiration have been suggested. However, the need to recommend patients to seek medical attention when aspiration does occur is not well established.

We experienced a patient who developed a lung abscess after barium aspiration and was diagnosed with pharyngeal cancer after a rigorous search for the cause. Pharyngeal cancer is a common cause of aspiration (2). However, the possibility of aspiration can be overlooked when the patient does not complain of dysphagia. To our knowledge, this is the first report highlighting the importance of a diagnostic protocol in the event of a barium aspiration.

Case Report

A 66-year-old man presented with a fever. He had no upper airway symptoms or symptoms related to dysphagia. He had a history of depression and insomnia, for which he was taking milnacipran, brotizolam, etizolam, trazodone, and nitrazepam.

Chest X-ray revealed consolidation in the right middle lung field, spotted with high-density deposits (Fig. 1). Chest computed tomography showed a low-attenuation mass in the right middle and lower lung lobes and multiple high-density deposits in the right middle bronchioles. The high-density deposits suggested foreign body aspiration. Rigorous history taking from the patient and his family revealed that one month earlier, he had choked during a barium examination for gastric cancer screening. Subsequently, he had suffered repetitive choking symptoms during meals and a persistent low-grade fever. He was diagnosed with lung abscess due to barium aspiration and was admitted for treatment.

The lung abscess improved after a 30-day treatment with antibiotics. Aspiration in an otherwise healthy 66-year-old

[1]Department of Respiratory Medicine, Iizuka Hospital, Japan, [2]Department of Physiology, Hyogo College of Medicine, Japan and [3]Department of Respiratory Medicine, Juntendo University Graduate School of Medicine, Japan
Received: August 7, 2020; Accepted: March 15, 2021; Advance Publication by J-STAGE: April 26, 2021
Correspondence to Dr. Yuki Yoshimatsu, yukitsukihana0105@gmail.com

prompted the need to investigate the cause. Drug-induced parkinsonism was suspected; however, he showed no other parkinsonism symptoms. Magnetic resonance imaging of the brain and upper gastrointestinal endoscopy showed no causative condition for aspiration. Laryngeal endoscopy revealed saliva and sputum pooling in the pyriform sinus (Fig. 2A). A swallow test was performed using purple-dyed thickened liquid, which showed pooling and poor clearance (Fig. 2B). However, the cause of the swallowing disorder was not clear during this exam. Repeated laryngeal endoscopy one week later revealed irregularity in the hypopharyngeal mucosa (Fig. 2C), which was biopsied to reveal squamous cell carcinoma.

Finally, the aspiration was attributed to decreased pharyngeal clearance due to hypopharyngeal cancer.

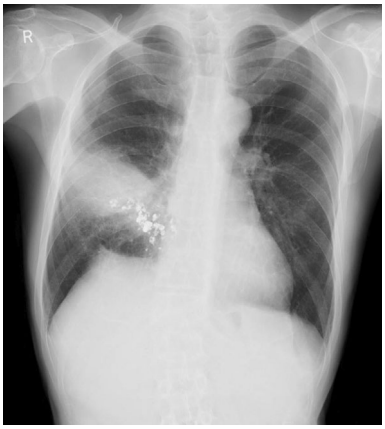

Figure 1. Chest radiograph on admission shows a consolidation in the right middle lung field, spotted with high-density deposits.

Discussion

We experienced a case in which hypopharyngeal cancer was diagnosed during treatment of a lung abscess owing to barium aspiration. Lung abscess and pharyngeal cancer are both life-threatening conditions if left untreated, and they could have been managed earlier in the present patient if he had sought medical attention sooner. However, even after the patient did seek medical attention, the pharyngeal cancer may have been left undiagnosed had the assessment for the swallowing disorder not been done thoroughly.

Aspiration is the most common complication of a barium examination. The incidence is reported to be 0.044% or 0.038% (3, 4), with those ≥70 years old having a 10-fold greater risk than those under 70 years old (4). As it is potentially fatal (5, 6), there have been multiple publications on how to prevent barium aspiration (3, 4). Suggested approaches include screening elderly patients for swallowing disorders, performing neck exercises before the exam, using designated cups, and asking the patient to drink slowly in small sips. However, there are no clear recommendations on how to manage those who have aspirated. Guidance is necessary to inform patients on what signs to look for following a barium examination and when and how to seek medical attention. Guidance is also needed for physicians encountering patients who may have aspirated barium, showing recommended diagnostic steps when considering the possibility of aspiration and how to diagnose its cause, along with a management plan for potential lower respiratory infection. Until such a guideline is formally established, The Clinical Practice Guidelines for the Diagnosis and Management of Dysphagia 2018 may be recommended for use

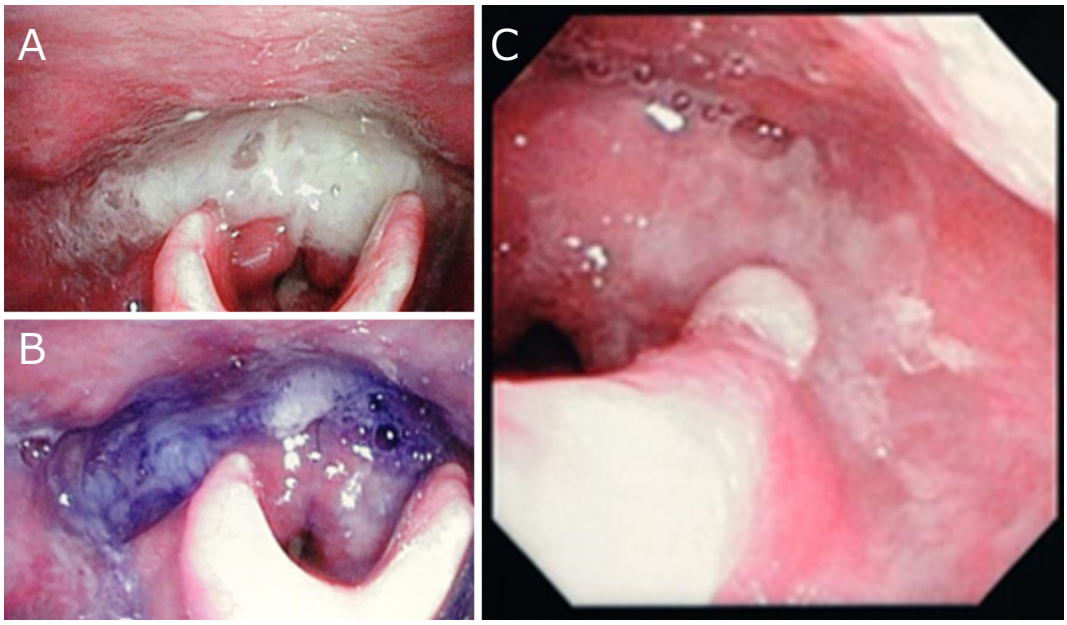

Figure 2. Laryngeal endoscopy. (A) Saliva and sputum pooling in the pyriform sinus. (B) A swallow test was performed using purple-dyed thickened liquid, which showed pooling and poor clearance. (C) An irregularity in the hypopharyngeal mucosa.

in these cases (7).

We previously performed a study of elderly patients who were suspected of having aspiration pneumonia (8). Among those who had no apparent cause of aspiration, 30.7% were later diagnosed with a new condition causing aspiration. Common underlying causes include neurological, gastrointestinal, and drug-induced conditions. Many causes call for emergent attention, highlighting the importance of thoroughly assessing the cause of aspiration in the management of aspiration pneumonia. Lung abscesses are mostly known to progress from untreated aspiration pneumonia (9). Therefore, the need to investigate causes of aspiration in lung abscesses is also high.

The primary purpose of a barium examination is to screen for gastric cancer. However, unexpected aspiration during the exam may lead to the diagnosis of a different underlying condition. To check for disorders of importance and not just the primarily intended one aligns well with the fundamental principle of a health checkup.

This case highlights the need to develop guidance for patients and physicians to follow in the event of barium aspiration.

Informed consent was obtained from the patient and family discussed in the report.

The authors state that they have no Conflict of Interest (COI).

Acknowledgement

The authors express their sincere gratitude to Doctor Hiroyuki Kamimura for his diagnostic management of the hypopharyngeal cancer.

References

1. Shibuya D, Ishikawa T, Ichinose M, et al. Annual report of complications related to gastric cancer screening: results of the Japanese Society of Gastrointestinal Cancer Screening survey from April 1, 2012 to March 31, 2013. J Gastrointestinal Cancer Screen **53**: 233-238, 2015 (in Japanese).

2. Shapiro J. Oropharyngeal dysphagia: pathophysiology, clinical assessment and management. Rev Gastroenterol Mex **59**: 91-95, 1994.

3. Yoshinaga Y, Oshita K, Yoshida S, et al. Current situation of barium aspiration at regional upper gastric mass screening. Chiba Surv Res J **6**: 49-53, 2017 (in Japanese).

4. Ohkuma R, Uematsu M, Fujishima I, Mukai A. Aspiration of barium contrast medium at gastric mass survey: investigation of aspiration cases encountered in upper gastrointestinal radiographic contrast study and its prevention. Jpn J Rehabil Med **39**: 180-185, 2002 (in Japanese).

5. Gombar KK, Singh B, Chhabra B. Fatal pulmonary aspiration of barium during oesophagography. Trop Doct **25**: 184-185, 1995.

6. Kaira K, Takise A, Goto T, Horie T, Mori M. Barium sulphate aspiration. Lancet **364**: 2220, 2004.

7. The Oto-Rhino-Laryngological Society of Japan. Clinical Practice Guidelines for the Diagnosis and Management of Dysphagia. Kanehara, Tokyo. 2018 (in Japanese).

8. Yoshimatsu Y, Tobino K, Ko Y, Yasuda M, Ide H, Oku Y. Careful history taking detects initially unknown underlying causes of aspiration pneumonia. Geriatr Gerontol Int **8**: 795-780, 2020.

9. Chung G, Goetz MB. Anaerobic infections of the lung. Curr Infect Dis Rep **2**: 238-244, 2000.