

Clinical utility of digital clubbing: A case of coronary artery disease and lung cancer

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Abstract

Clubbing of the fingers or toes is a known manifestation of an underlying disease. We report a case of coronary artery disease in which digital clubbing was useful for the diagnosis of lung cancer. A 62-year-old man was referred to the Department of Cardiology of our hospital because of chest oppression on effort. Physical examination was unremarkable except for clubbing of the fingers without cyanosis. Chest radiography demonstrated a round mass in the right upper lung field and a diagnosis of coronary artery disease, accompanied with lung adenocarcinoma, was finally made. After thoracoscopic lobectomy, the digital clubbing gradually reduced. The patient then underwent percutaneous coronary intervention with stent implantation. Physical examination may aid in planning diagnostic procedures for patients with chest pain when clubbing is observed.

Keywords

Digital clubbing; Coronary artery disease; Lung cancer; Case report; Physical examination.

Introduction

Clubbing is the bulbous enlargement of the ends of the fingers or toes. This characteristic physical sign can develop in many conditions and may resolve after treatment of the underlying disease [1,2]. We report a case of coronary artery disease in which digital clubbing was useful for the diagnosis of lung cancer.

Case Report

Investigations

A 62-year-old man was referred to the Department of Cardiology of our hospital because of chest oppression. The patient was in a normal state of health until approximately three months before presentation, when chest oppression on effort, such as a three- to five-minute walk in the morning, developed. Radiation of the pain to the shoulder was absent and it resolved at rest. His medical history included acute hepatitis and surgery for sigmoid colon cancer. He was not taking any medications at presentation. The patient was a current smoker with a 21-pack-year history, occasionally drank in moderation, and had no known allergies. His father had myocardial infarction.

On examination, his blood pressure was 148/74 mmHg, pulse was 74 beats per minute, body temperature was 36.6°C, and oxygen saturation was 98% while breathing ambient air. The jugular venous pressure was not high and the fourth heart sound was audible at the apex. No pulmonary rales were heard and there was no edema in the legs. Of note, clubbing of the fingers was observed without cyanosis (Figures 1A and 1B).

Electrocardiography demonstrated a heart rate of 57 beats per minute, a normal axis, and no ST-T segment changes. Chest radiography revealed a round mass with a diameter of 32 mm X 32 mm in the right upper lung field (Figure 2). The complete blood cell counts were normal, as were the results of renal and liver function tests, electrolyte balance, and thyroid function test. The level of brain natriuretic peptide was 13.2 pg/mL (reference value, ≤ 18.4). The troponin T level was 0.007 ng/mL (reference value, ≤ 0.014). There were no abnormal findings on echocardiography.



Figure 1: A On presentation, clubbing was observed (A). The angle between the nail bed and the proximal nail fold of the right index finger was almost 180°, accompanied by the bulbous enlargement of the fingertip (B). Approximately three months later, the severity of digital clubbing reduced (C), with an angle $< 180^\circ$ (D, arrow), a less curved nail (D, large black arrowhead), and improved swelling of the fingertip (D, small white arrowheads). Four months after presentation, the digital clubbing disappears (E and F).

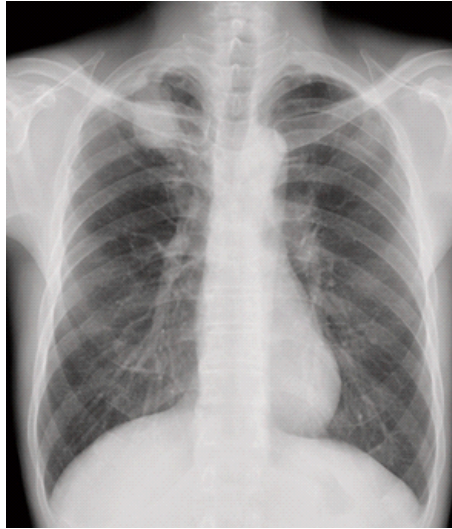


Figure 2: Chest radiography

A round-shaped tumor is observed in the right upper lung field. No cardiomegaly, pleural effusion, or pulmonary congestion is present.

Diagnosis

Although coronary artery computed tomography (CT) demonstrated significant stenosis in the left anterior descending coronary artery and circumflex artery, examination of the lung mass was prioritized because there were no signs of acute coronary syndrome. A diagnosis of lung adenocarcinoma was made and thoracoscopic right upper lobectomy was performed. His clinical course was uneventful and he was discharged home.

Treatment

His chest symptoms did not resolve after surgery, but the severity of digital clubbing gradually reduced (Figures 1C and 1D). The patient underwent coronary angiography, which revealed total occlusion in the midportion of the left anterior descending artery and moderate stenosis in the midportion of the left circumflex artery, findings consistent with the results on coronary CT. After dual antiplatelet therapy was initiated using aspirin at a dose of 100 mg daily and clopidogrel at a dose of 75 mg daily, the patient underwent percutaneous coronary intervention with stent implantation.

Follow-up and outcomes

The digital clubbing almost disappeared approximately one month after administration of antiplatelet therapy (i.e., four months after presentation) (Figures 1E and 1F). The patient has been doing well without recurrence of lung cancer or coronary artery disease for more than six months after coronary intervention.

Discussion

We reported a case of chest oppression in which clubbed fingers were observed on physical examination. The patient was diagnosed with lung cancer and coronary artery disease. His symptoms persisted after thoracoscopic lung resection, but the severity of digital clubbing gradually reduced.

Clubbing of the fingers has been a known manifestation of an underlying disease since the time of

Hippocrates, a Greek physician in around 400 BC [3]. A diagnosis of digital clubbing may be made when the angle between the nail bed and the proximal nail fold is more than 180° because the normal angle is 160° [4]. The Schamroth sign, a lack of the diamond-shaped window normally observed between the proximal tips of the nails when the distal phalanges are placed together, is also useful for bedside assessment [5]. Digital clubbing without cyanosis, as noted in the present case, is observed in numerous conditions, especially in lung diseases (e.g., cancers, abscess, bronchiectasis, cystic fibrosis, emphysema, and chronic infection), whereas congenital cardiovascular defects can cause clubbing of the fingers and toes with cyanosis [6].

The exact mechanism of clubbing remains unclear, but cytokines released from aggregated platelets and megakaryocytes, such as vascular endothelial growth factor-A and platelet-derived growth factor, have been proposed as the most likely pathogenesis [7,8]. It is reasonable to consider that in patients with pulmonary diseases, megakaryocytes or megakaryocyte fragments may bypass the lung capillary network and reach the fingertips, leading to an increase in capillary permeability and connective tissue hypertrophy [9]. In addition, large platelet clumps or a chronic platelet excess related to these lung conditions may cause clubbing [9].

Lung cancer is the most likely cause of clubbing in adults and the incidence was reported to be 17.3% in a cohort of 738 patients, with no significant difference between small cell lung cancer and non-small cell lung cancer [10]. Digital clubbing associated with lung cancer can reduce in a relatively short period of time, such as 90 days, after effective surgical treatment [11], as observed in our patient. Regression of digital clubbing was also reported in a patient with lung cancer who was treated using chemotherapy, radiation therapy, and immunotherapy [12]. Considering the mechanism of clubbing, antiplatelet therapy, which is frequently used in the management of coronary artery disease, may ameliorate it [13], although the synergy effect of antiplatelet therapy on lung cancer resection remains unclear in our case. Further studies are warranted to examine the clinical implications of the reversal of digital clubbing on the prognosis.

The chest symptom of our patient was considered to be associated with coronary artery diseases because it persisted after lung surgery. In patients who have typical symptoms of coronary artery disease, CT angiography is highly recommended if not contraindicated. Although chest radiography can be replaced by coronary CT, attention should be paid to the fact that CT of the heart does not include the whole lung area, such as the apex, in which superior sulcus tumors or Pancoast tumors cause painful symptoms requiring a differential diagnosis from cardiac pain [14, 15]. Therefore, it is important to keep in mind that physical examination can aid in planning diagnostic procedures for patients with chest pain such as performing coronary CT angiography accompanied by whole lung scanning when clubbing is observed.

Conclusion

In conclusion, our case highlights the clinical importance of physical examination even in the era of advanced imaging modalities.

Learning objective: Clubbing of the fingers is a known manifestation of an underlying disease, such as lung diseases. We report a case of coronary artery disease in which digital clubbing was useful for the diagnosis of lung cancer.

Declarations

Acknowledgments: None to declare.

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Author contributions: TT and TK contributed to data analysis and study design; TT and TK wrote the paper; TT, DS, KH, TY, HI, and TK treated the patient; all authors reviewed the paper and gave the final approval.

Data availability: The authors declare that data supporting the findings of this study are available within the article.

Informed consent: Not applicable.

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