Paradoxical respiration: 'Seesaw' motion with massive pulmonary consolidation

Takeshi Saraya, Masafumi Shimoda, Aya Hirata, Hajime Takizawa

Department of Respiratory Medicine, Kyorin University School of Medicine, Mitaka, Japan

Correspondence to
Dr Takeshi Saraya,
sara@yd5.so-net.ne.jp

Accepted 25 December 2015

DESCRIPTION

A 48-year-old woman was transferred to our hospital because of non-resolving pneumonia with rapidly progressive respiratory failure.

She had no remarkable medical history or history of illicit drug use. She was admitted to her local hospital 5 days before coming to our hospital with 4 days of fever and dry cough. With a tentative diagnosis of atypical pneumonia, she was treated with intravenous minomycin (200 mg/day).

On admission (day 1), she was fully conscious and her vital signs were: temperature 37.2°C; heart rate 85 bpm; blood pressure 104/70 mm Hg; SpO_2 90% on oxygen at 10 L/min by mask (arterial blood gas (ABG): pH 7.453, pCO_2 39.1 Torr, pO_2 54.4 Torr, HCO_3^- 27 mmol/L) and respiratory rate 36 bpm.

On physical examination, no adventitious breath sounds were noted, but the chest wall moved in during inhalation and out during exhalation together with dyssynchrony between the rib cage and abdomen (video 1), in a 'seesaw' type of motion, suggesting acute respiratory failure.

Chest X-ray (figure 1A) and thoracic CT (figure 1B) showed massive consolidation with air bronchogram and ground glass opacities in bilateral middle to lower lung lobes. Based on the radiological findings, the patient was diagnosed with acute interstitial pneumonia and was immediately treated with nasal high-flow oxygen therapy, intravenous steroid pulse therapy (1000 mg/day for 3 days/course for 3 courses) and an oral immunosuppressive drug (cyclosporine 150 mg/day). Three weeks later, her seesaw motion disappeared with respiratory status improvement (SpO2 98% on 3 L/min oxygen via nasal cannula, ABG: pH 7.431, pCO_2 40.9 Torr, pO_2 59.7 Torr, HCO_3^- 26.7 mmol/L). At that time, the lung lesions markedly improved as well (figure 1C, D).

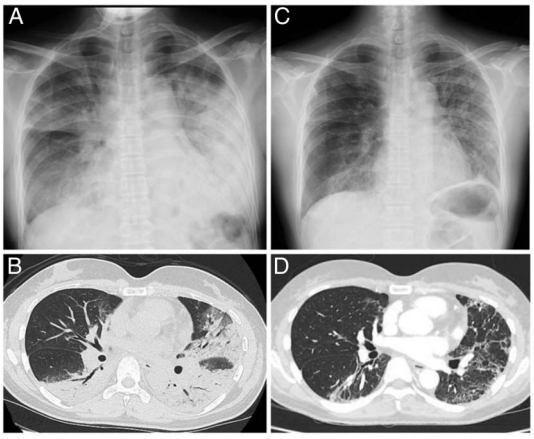

Figure 1 The pattern of respiration showing deflation of the lung during inspiration and inflation of the lung during expiration. Chest X-ray (A) and thoracic CT (B) on admission showed massive consolidation with air bronchogram and ground glass opacities in bilateral middle to lower lung fields. Three weeks later, those lesions almost disappeared except for faint ground glass opacities with mild consolidation and/or bronchiectasis (C and D).

Paradoxical respiration (seesaw motion) is a hallmark of inhibition of gas exchange due to diaphragmatic or respiratory muscle fatigue (ie, chronic obstructive lung disease)[1] or traumatic injury to the thorax (flail chest), which may require urgent mechanical ventilation.

Learning points

- Seesaw motion is a type of paradoxical respiration, suggesting impaired gas exchange that might require mechanical ventilation.
- Seesaw motion suggests or predicts respiratory failure due to diaphragmatic or respiratory muscle fatigue.

video 1 Seesaw motion on the day of admission

Contributors TS, MS, AH and HT managed the patient. TS wrote the manuscript.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCE

1 Macklem PT. Respiratory muscle dysfunction. *Hosp Pract (Off Ed)* 1986;21:83–90. 5–6.

To cite: Saraya T, Shimoda M, Hirata A, *et al*. *BMJ Case Rep* Published online: [*please include* Day Month Year] doi:10.1136/bcr-2015-213449