

Clinical diagnosis

Case 358

4. Pulmonary lipid embolism

【Discussion】

When we encounter a case with massive opacity irrespective of consolidation or ground glass on chest radiograph, it is important to check whether the patient fall into acute respiratory distress syndrome (ARDS) or not. The definition of ARDS is: PaO_2/FiO_2 is less than 300. FiO_2 means fraction of inspired oxygen. O_2 fraction in atmosphere is 0.21 (21%). O_2 fraction increases in case of O_2 inhalation via nasal canula or oxygen mask: FiO_2 , 0.44 in 6L/min via nasal canula, FiO_2 , 0.8 in 8L/min via oxygen mask with reservoir. In our case of PaO_2 61% with 10L/min via oxygen mask with reservoir, $PaO_2/FiO_2 = 0.61/0.8$, 76. ARDS is categorized in mild ($300 > PaO_2/FiO_2 > 200$), moderate ($200 > PaO_2/FiO_2 > 100$), and severe (< 100) (1). Then, our case was in severe ARDS.

Pulmonary diffuse opacity in bilateral lung happens in several diseases; infectious pneumonia caused by bacteria, mycotic, virus, and inhalation; acute interstitial pneumonia; sepsis: pulmonary contusion (2, 3). Lipid embolism mimics septic emboli, inducing subcutaneous hemorrhage, dyspnea and brain embolism. Along with lipid particles causing embolism, fatty acids cause irritation to vascular wall with infiltration of white blood cells. Pulmonary diffuse opacity with the presence of bone fracture and the absence of cardiomegaly makes pulmonary lipid embolism suspicious.

Pulmonary embolism occurs in 2% after long bone fracture and in 20 to 30 % after severe bone fractures such as bilateral long bone fractures (2-6). The symptoms onset usually 2 or 3 days after bone fracture. The symptoms are pulmonary insufficiency, brain disorder, subcutaneous hemorrhage (2, 3).

Managements for lipid embolism are early closure of bone fracture and conservative drip infusion and preserve of PO_2 in blood gas analysis using PEEP and artificial respirator. The damages from lipid embolism are transient and its prognosis is relatively good (7).

In our case, pulmonary insufficiency occurred 2 days after femoral neck bone fracture. Chest CT depicted massive ground glass opacity in bilateral pulmonary lobes. PO_2 dropped to 76 of $PaO_2/FiO_2 = 0.61/0.8$, 76, indicative of severe ARDS. The patient received O_2 inhalation with reserve mask for several days, leading recovery of symptoms, becoming enable to receive orthopedic surgery.

【Summary】

We presented an eighty-one-year-old female with hypo-oxygen gas in blood two days after femoral neck bone fracture. Chest CT depicted diffuse massive infiltration in both lobes of lung. $\text{PaO}_2/\text{FiO}_2 = 0.61/0.8, 76$, indicative of severe ARDS. It is borne in mind that there listed several diseases for bilateral diffuse massive infiltration; pneumonia including bacteria, viral, mycotic, inhalation; acute interstitial pneumonia; sepsis (septic emboli), and lipid embolism. The symptoms of lipid embolism appear one or two days after long bone fracture in 1-2% incidence. ARDS is categorized based on $\text{PaO}_2/\text{FiO}_2$: mild ($300 > \text{PaO}_2/\text{FiO}_2 > 200$), moderate ($200 > \text{PaO}_2/\text{FiO}_2 > 100$), and severe (< 100). $\text{PaO}_2/\text{FiO}_2$ in our case was around 70, indicative of severe ARDS. Managements for lipid embolism are early closure of bone fracture and conservative drip infusion and preserve of PO_2 in blood gas analysis using PEEP and artificial respirator. In our case, symptoms turned improving as time progress.

【References】

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back

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