

Probable imaging diagnosis

Case 292

2. Fungal pneumonia

【Progress】

She was administered antifungal medicine. Regrettably, she passed away two weeks later.

【Discussion】

At admission, her laboratory test revealed marked decrease of neutrophils, platelets and increase of CRP and D dimer, making possible diagnosis of septic shock. However, despite of decrease of CRP, neutrophils counts did not rise. It indicated suspicious of falling in hemophagocytic histiocytosis (hemophagocytic syndrome). Hemophagocytic histiocytosis is caused by abnormal proliferation of macrophages or histiocytes who phagocyte neutrophils, platelets and erythrocytes shown in bone marrow (1-3). Then, steroid pulse followed by continuing preserving steroid treatment. It induced improve general condition. However, fever, elevation of CRP and neutrophils emerged. Chest CT showed a large lesion with large crescent-like or ring-like thick consolidation plus fibrous ground glass opacity inside, and pleural small nodules. Our respiratory internal physician suspected possible diagnosis of possible invasive fungus infection.

As representatives of invasive fungus infection, invasive aspergillosis and invasive mucormycosis are listed, although other pulmonary fungus diseases are present caused by cryptococcus and pneumocystis jirovecii (4). Fungal infection occurs when immune potency weakens such as in a situation of decrease of lymphocyte count and neutrophils count. For example, pneumocystis jirovecii is reported to emerge when lymphocyte count lowers less than 500/mm³, inducing bilateral consolidation and then, leading acute respiratory syndrome (4). Aspergillosis and mucormycosis can occur in an immunocompromised situation. Our patient was under a condition of phagocytic syndrome followed by administration of much volume of steroid, namely immunocompromised situation.

A halo sign which implies solid mass with ill-defined margin plus ground glass opacity in the surrounding on CT is reported first in invasive aspergillosis. Pathologically, aspergillosis invades pulmonary artery, causing infarction and hemorrhage (5). Solid mass composes of infarction and the surrounding, of hemorrhage in case of invasive aspergillosis (5).

A reverse halo sign or bird's nest sign which implies configuration of ring or crescent with fibrous ground glass opacity inside on CT is reported to be pathognomonic to invasive mucormycosis (6-8). Pathologically, a ring-like or a crescent like configuration composes of connective tissue, and inside fibrous ground glass composes of septal inflammation or fibrosis (6-8).

Although both a halo sign and a reverse halo sign are found in other diseases in immune-competent patients, when limited to a patient with immune-compromised situation, a halo sign is pathognomonic to invasive aspergillosis and a reverse halo sign is pathognomonic to invasive mucormycosis.

【Summary】

We presented a seventy eight -year-old female who was admitted to our hospital for hemophagocytic syndrome who was administered steroid pulse treatment. During decreasing and preserving steroid, high fever and inflammatory marker elevation in laboratory test re-emerged. Chest CT showed reverse halo sign or bird's nest sign, implying probable diagnosis of invasive mucormycosis. It is borne in mind that hemophagocytic syndrome implies that macrophages abnormally proliferated, phagocyte neutrophils, platelets and red blood cells. In immune-compromised patients, a halo sign demonstrated on chest CT implies invasive aspergillosis and a reverse halo sign or a bird's nest sign on chest CT implies invasive mucormycosis. Pathologically, a halo sign indicates infarction in the center and hemorrhage in the surrounding, while a reverse halo sign or bird's nest sign indicates connective granulation in the surrounding and septal inflammation in the center.

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