|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **History/onset** | **Symptoms** | **Radiology** | **PFT/**  **catheterization** | **BAL** | **Histology (TB or surgical via VATS)** |
| **PEGS** | * \*Periengraftment * G-CSF use * More common in autoHCT * Acute onset | * Fever * \*Rash | * Diffuse infiltrates | * Not needed | * Neutrophil predominance | * Not needed |
| **DAH** | * \*Periengraftment * Median 23 days * Acute onset | * Dyspnea * Cough * Hypoxemia * Often fever * Rarely   hemopthysis | * Bilateral areas of ground-glass attenuation or consolidation involving middle and lower lung zones | * Not useful | * \*Bloody * Or greater than 20% hemosiderin-laden macrophages | * Diffuse alveolar damage with alveolar hemorrhage |
| **IPS** | * 21 to 65 days (range 0 to 1,600 days) * Subacute onset | * Dyspnea * Dry cough * Fever | * Diffuse bilateral interstitial infiltrates | * Not useful | * Excludes infection | * TB will suffice * Diffuse alveolar damage or * Inters­titial pneumonitis |
| **PCT** | * 2 to 3 months * Children * GVHD | * Cough * Chest pain * Fever | * Peripheral nodules | * Not needed | * Excludes infection, in particular IFI | * VATS is optimal * \*Occlusive vascular lesions and hemorrhagic infarcts |
| **BOOP** | * 2 to 12 months * Acute onset | * Fever * Dyspnea * Dry cough | * Peripheral or peribronchovascular patchy infiltrate | * \*Restrictive * Normal FEV1/FVC * ↓DLCO * ↓ TLC | * Excludes infection * Lymphocyte predominance | * \*Peribronchiolar lymphocytic infiltration * Fibrosis and granulation tissue in the lumen of the distal airways |
| **BO** | * Greater than100 days * 6 to 12 months * GVHD * \*AlloHCT * Insidious onset | * \*No fever * Wheezing | * Normal * Hyperinflation * Air trapping * Small airway thickening * Bronchiectasis * Pneumothorax in advanced cases | * \*Obstructive * FEV1 less than 75% * FEV1:FVC less than 0.7 * RV greater than 120% * Normal or ↓DLCO | * Excludes infection * Neutrophil predominance | * Intraluminal dense fibrosis * Narrowing or obliteration of lumen of bronchioles * No mononuclear cell infiltration in interstitial or alveolar tissue. |
| **VOD of lung** | * Male | * Dyspnea * Syncope * Rarely hemoptysis | * \*Septal lines * Ground-glass opacities * Lymph node enlargement | * DLCO less than 55% * \*Pulmonary HTN * Normal PCWP) (less than 15 mmHg) | * Occult alveolar hemorrhage * Excludes infection | * Not recommended |

**Table I. Differences between pulmonary complications of hematopoietic stem cell transplantation**

**(complications are listed in an order of predicted onset)**

\*Most important factor in differential diagnosis

**Abbreviations:**

PEGS: periengraftment syndrome

DAH: diffuse alveolar hemorrhage

IPS: idiopathic pneumonia syndrome

PCT: pulmonary cytolytic thrombi

BO: bronchiolitis obliterans

BOOP: bronchiolitis obliterans organizing pneumonia

GVHD: graft-versus-host disease

IFI: invasive fungal infections

VOD: veno-occlusive disease of lung

TB: transbronchial biopsy

VATS: video-assisted thoracoscopic surgery

HTN: hypertension

TLC: total lung volume

RV: residual volume

PCWP: pulmonary capillary wedge pressure

DLCO: diffusion lung capacity for carbon monoxide

PFT: pulmonary function test

GCSF: granulocyte colony-stimulating factor