| Table I. Differences between pulmonary complications of hematopoietic stem cell transplantation (complications are listed in an order of predicted onset) |
|---|---|---|---|---|---|
| **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 hemoptysis | 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  
VATS is optimal  
*Occulsive vascular lesions and hemorrhagic infarcts* |
| **PCT** | 2 to 3 months  
Children  
GVHD | Cough  
Chest pain  
Fever | Peripheral nodules | Not needed | Excludes infection, in particular IFI  
*Peribronchiolar lymphocytic infiltration*  
Fibrosis and granulation tissue in the lumen of the distal airways |
| **BOOP** | 2 to 12 months  
Acute onset | Fever  
Dyspnea  
Dry cough | Peripheral or peribronchovascular patchy infiltrate | *Restrictive*  
Normal FEV1/FVC  
↓DLCO  
↓TLC | *Obstructive*  
*pulmonary HTN*  
Normal PCWP (less than 15 mmHg)  
Occult alveolar hemorrhage  
Excludes infection  
Not recommended |
| **BO** | Greater than 100 days  
6 to 12 months  
*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  
Syncopé  
Rarely hemoptysis | *Septal lines*  
Ground-glass opacities  
Lymph node enlargement | DLCO less than 55%  
*Pulmonary HTN*  
Normal PCWP (less than 15 mmHg) | Excludes infection  
Occult alveolar hemorrhage  
Excludes infection  
Not recommended |

**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

*Most important factor in differential diagnosis*