

# Thoracic Surgery in Patients with AIDS



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## KEYWORDS

• HIV • AIDS • Thoracic surgery

## KEY POINTS

- Thoracic surgery had its origin for the treatment of infections of the pleural space, mostly related to complications of tuberculosis.
- Human immunodeficiency virus infection and AIDS are a spectrum of conditions caused by infections with the human deficiency virus.
- As the infection progresses, it compromises the immune system, increasing the risk of common infections like tuberculosis as well as other opportunistic infections and also giving rise to tumors.
- Specifically, infections, such as pneumocystis pneumonia and esophageal candidiasis, may require the attention of a thoracic surgeon.

## INTRODUCTION

Thoracic surgery had its origin for the treatment of infections of the pleural space, mostly related to complications of tuberculosis (TB). Human immunodeficiency virus (HIV) infection and AIDS are a spectrum of conditions caused by infections with the human deficiency virus. As the infection progresses, it compromises the immune system, increasing the risk of common infections like TB as well as other opportunistic infections and also giving rise to tumors. Specifically, infections, such as pneumocystis pneumonia and esophageal candidiasis, may require the attention of a thoracic surgeon. In this article, the authors discuss the care of patients with HIV as it pertains to thoracic surgery and how these patients may present with different issues than non-HIV patients.

## PNEUMOTHORAX

Pneumothoraxes are uncommon in HIV-infected patients but could portend an overall poor

prognosis.<sup>1</sup> The causes of pneumothoraxes in those patients are many, including Kaposi sarcoma, toxoplasmosis, bacterial, fungal, and viral and mycobacterial infections; but most often it is pneumocystis jiroveci pneumonia (PCP).<sup>2</sup> The possible risk factors are aerosolized pentamidine, low CD4 count, cigarette smoking, and PCP infection. The treatment is similar to non-HIV-infected patients, with observation of small pneumothoraxes and chest tube thoracostomy for larger pneumothoraxes or tension physiology. Although this would be categorized as a secondary pneumothorax, immediate surgical intervention is not obligatory. The same principles as for primary spontaneous pneumothoraxes can be applied, with the lowest recurrence rate being reported for thoracotomy and pleurectomy but very high success rates also with video-assisted thoracoscopic surgery, pleural abrasion, or partial pleurectomy. Chemical pleurodesis is also a choice, although the authors reserve those for malignant effusions.<sup>3</sup>

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## NECROTIZING ESOPHAGITIS

Necrotizing esophagitis (black esophagus) is a rare, potentially lethal finding that can progress to esophageal perforation. Although very rare, it is more common in patients with AIDS and other hematologic malignancies and carries an extremely high mortality rate, exceeding 50%.<sup>4</sup> As reported by Gaissert and colleagues,<sup>4</sup> mortality without intervention was 90% and is lowest in patients with surgical intervention, 27%. In their series, intervention ranged from stenting and drainage to esophagectomy, with 8 out of 11 patients surviving. It is more common for patients with HIV to have infectious esophagitis, but progression to necrosis is rare.<sup>5</sup> The clinical presentation can be as insidious as hematemesis and melena as well as incidental findings on endoscopy for other reasons to fulminant sepsis because of perforation.

## PLEURAL EFFUSION IN PATIENTS WITH HUMAN IMMUNODEFICIENCY VIRUS

Pleural effusions are common among patients with AIDS and in hospitalized patients the prevalence varies up to 27%.<sup>6</sup> Most effusions are caused by infections, but noninfectious causes are found in up to one-third of cases. Opportunistic infections are more frequent with a CD4 count less than 150 cells per microliter. Because viral infections are responsible for some of the malignant effusions (Kaposi's sarcoma [KS], multicentric Castleman disease, primary effusion lymphoma), the distinction between infectious and noninfectious is less clear. Bacterial pneumonia, especially *Streptococcus pneumoniae*, is common and can lead to an empyema, requiring thoracic consultation and treatment beyond just simple thoracentesis.<sup>7,8</sup> Pleural effusions due to PCP are uncommon and can also cause pleural masses and pneumothorax.<sup>9</sup> Mycobacterium TB and mycobacterium avium complex account for around 10% of pleural effusions in patients with AIDS. Pleural TB can present without parenchymal disease and only a pleural effusion. The effusion is almost always exudative with normal pH and glucose levels. The nucleated cell count is usually lower than in non-HIV patients with TB pleurisy; the effusion is predominant lymphocytic.<sup>10</sup>

## CANCER AND HUMAN IMMUNODEFICIENCY VIRUS

Patients with AIDS have an increased incidence of Kaposi sarcoma (including pulmonary), intermediate- or high-grade lymphoma, and uterine cervical cancer. Kaposi sarcoma is a low-grade vascular

tumor associated with human herpesvirus 8 (HHV-8). HHV-8 is also linked to primary effusion lymphoma and multicentric Castleman disease. The incidence of pulmonary Kaposi sarcoma is difficult to determine but was found in 47% of autopsies of patients with cutaneous lesions.<sup>11</sup> The main presenting symptoms are cough and shortness of breath. Hemoptysis can occur, and patients have cutaneous lesions as presented in the study by Miller and colleagues.<sup>12</sup> Pleural effusions are common; in general, pulmonary and pleural involvement is a harbinger of a short life expectancy. Bronchoscopy will usually yield a diagnosis, but lesions can also be found on the visceral and parietal pleura during thoracoscopy. The main treatment of pulmonary KS is antiretroviral therapy (ART), which takes a few months to see an initial spike in CD4 count. Before ART, the outlook was dismal and combination chemotherapy was given, with decent response rates.<sup>13</sup>

Non-Hodgkin lymphoma (NHL) is another AIDS-defining malignancy due to the impaired cellular immunity. Among those with HIV, approximately 10% will develop an NHL, with primary effusion lymphoma being the least common of the acquired AIDS-related lymphomas.<sup>14</sup> These body cavity-based lymphomas represent as lymphoma cells in serosa lined cavities (pleura, pericardium, and peritoneum). There is no tumor mass, lymphadenopathy, or organomegaly. The key diagnostic criterion is the presence of HHV-8 in the nuclei of malignant cells.<sup>15</sup> A chest radiograph shows unilateral or bilateral pleural effusion with no parenchymal infiltrates or mediastinal adenopathy. Computed tomography of the chest usually confirms these findings with slight thickening of the parietal pleura.<sup>16</sup> The differential diagnosis includes systemic lymphomas with secondary involvement of the body fluid and lymphomas that develop as a result of chronic pyothorax. The presence of HHV-8 positivity can help distinguish primary effusion lymphoma from others.<sup>15</sup>

## LUNG CANCER AND HUMAN IMMUNODEFICIENCY VIRUS

The deadliest cancer worldwide, lung cancer, has a higher incidence in HIV-infected patients than in the general population.<sup>17,18</sup> Also, HIV-infected patients tended to be younger, the cancer more advanced, and adenocarcinoma the most frequent histologic diagnosis.

The risk of lung cancer is significantly higher in patients with HIV (2–4 fold) and has not changed with the introduction of ART. Even after correcting for smoking status, the risk of lung cancer remains elevated compared with age- and sex-matched

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