

Breakthrough *Pneumocystis jiroveci* pneumonia under pentamidine prophylaxis: imaging findings revisited

Use of prophylaxis against *Pneumocystis jiroveci* is a well-recognised strategy for prolonging survival in people infected with the human immunodeficiency virus (HIV). Currently, trimethoprim-sulfamethoxazole (TMP-SMX) is prescribed as a first-line drug, with dapsone or atovaquone used when TMP-SMX is contra-indicated. Improvements in anti-retroviral (ARV) therapy have led to a decline in the need for prophylaxis, so older regimens popular during the 1980s, such as nebulised pentamidine prophylaxis, are rarely used today. As such, pentamidine is largely of historical interest only. Nevertheless, there remain cases, such as patients with allergies to first-line prophylactic agents, where pentamidine is the only available prophylactic agent.

Recently, a 60-year-old HIV-positive man presented with progressively worsening exertional dyspnoea over 1 week. He had been managed with monthly doses of nebulised pentamidine prophylactically for the past 4 years. The nebulised pentamidine was prescribed because he developed a severe skin reaction to TMP-SMX and was allergic to dapsone and atovaquone. Furthermore, he was known to be non-compliant with his ARV regimen, resulting in recurrent admissions. On this most recent admission, he was found to be leukopenic with a total white cell count of 1.9×10^9 /L and an absolute CD4 count of 40 cells/ μ L. Figure 1 shows his admission chest radiographs (CXR) and Fig 2 his computed tomographic (CT) images.

His admission CXR (Fig 1a) showed reticulo-nodular shadowing on a background of ground-glass changes with formation of small cysts (Fig 1b). Innumerable lung cysts with interlobular septal thickening and surrounding ground-glass changes were found on CT in the upper lobes (Fig 2). Notably, bilateral upper lobe disease is seen on both the CXR and CT. The history of pentamidine prophylaxis and the striking upper lobe disease distribution seen on imaging is typical of breakthrough *P jiroveci* pneumonia. The patient was successfully treated with 4 weeks of oral primaquine and clindamycin, and showed both clinical and radiological improvement (Fig 3).

This case illustrates the radiographic appearance of breakthrough *P jiroveci* pneumonia under pentamidine prophylaxis. This radiographic appearance is rather rare in current day practice due to the limited current use of nebulised pentamidine,

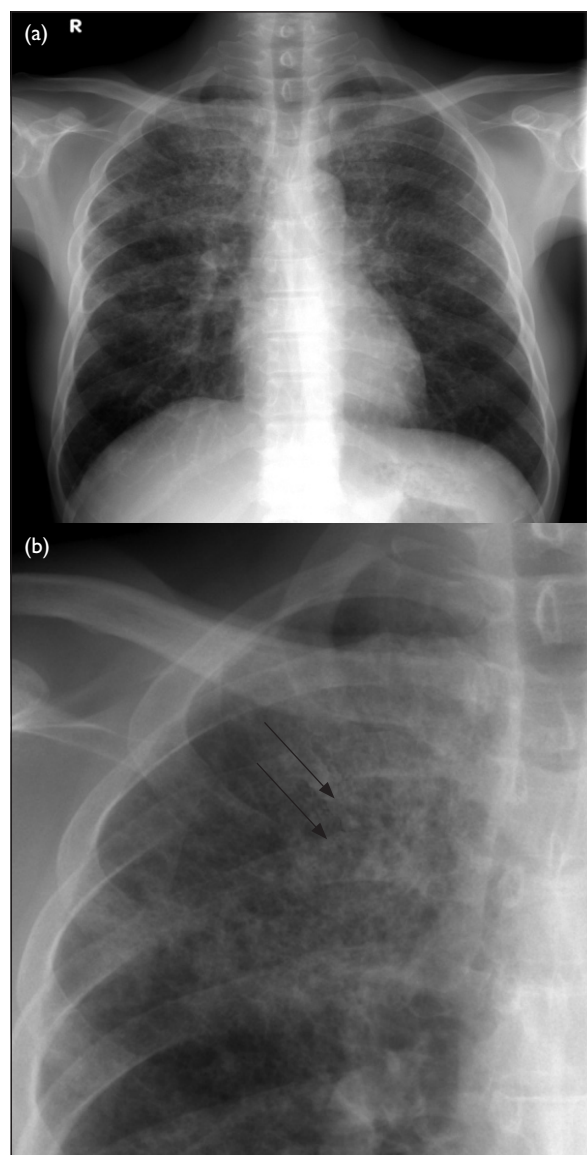


FIG 1. (a) Frontal chest radiograph and (b) magnified view of the right upper lobe of the patient during admission showing bilateral symmetrical reticulo-nodular shadowing in the predominant upper zone distribution (a). Cystic changes are also present (arrows, b)

however, when present in conjunction with an appropriate history, the radiographic appearance is highly diagnostic. The upper lobe distribution is different from the more familiar perihilar and basal distribution seen in *P jiroveci* pneumonia in HIV patients who are not on pentamidine prophylaxis. The

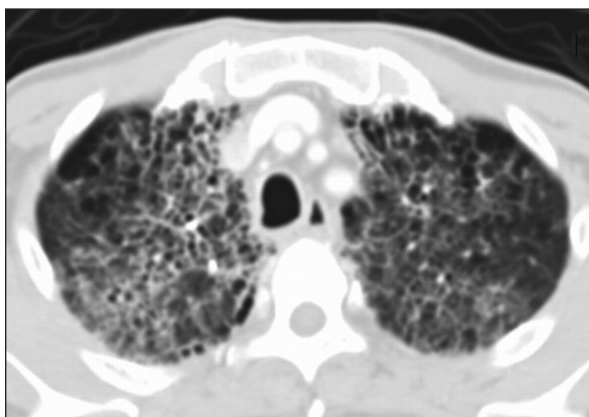


FIG 2. Computed tomographic image of the upper lung zones showing extensive interlobular septal thickening on a background of ground-glass changes and numerous lung cysts. Findings are consistent with breakthrough *Pneumocystis jiroveci* pneumonia



FIG 3. Chest radiograph obtained 4 weeks after treatment showing complete resolution of the lung changes

appearance of cyst formation on chest radiography is also more common in patients who are being given pentamidine prophylaxis.^{1,2} Although bronchoalveolar lavage (BAL) and sputum culture remain the gold standard, a positive BAL and culture can be difficult to obtain in such cases. For this reason, recognising the well-described imaging features of breakthrough *P jiroveci* pneumonia is crucial.

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