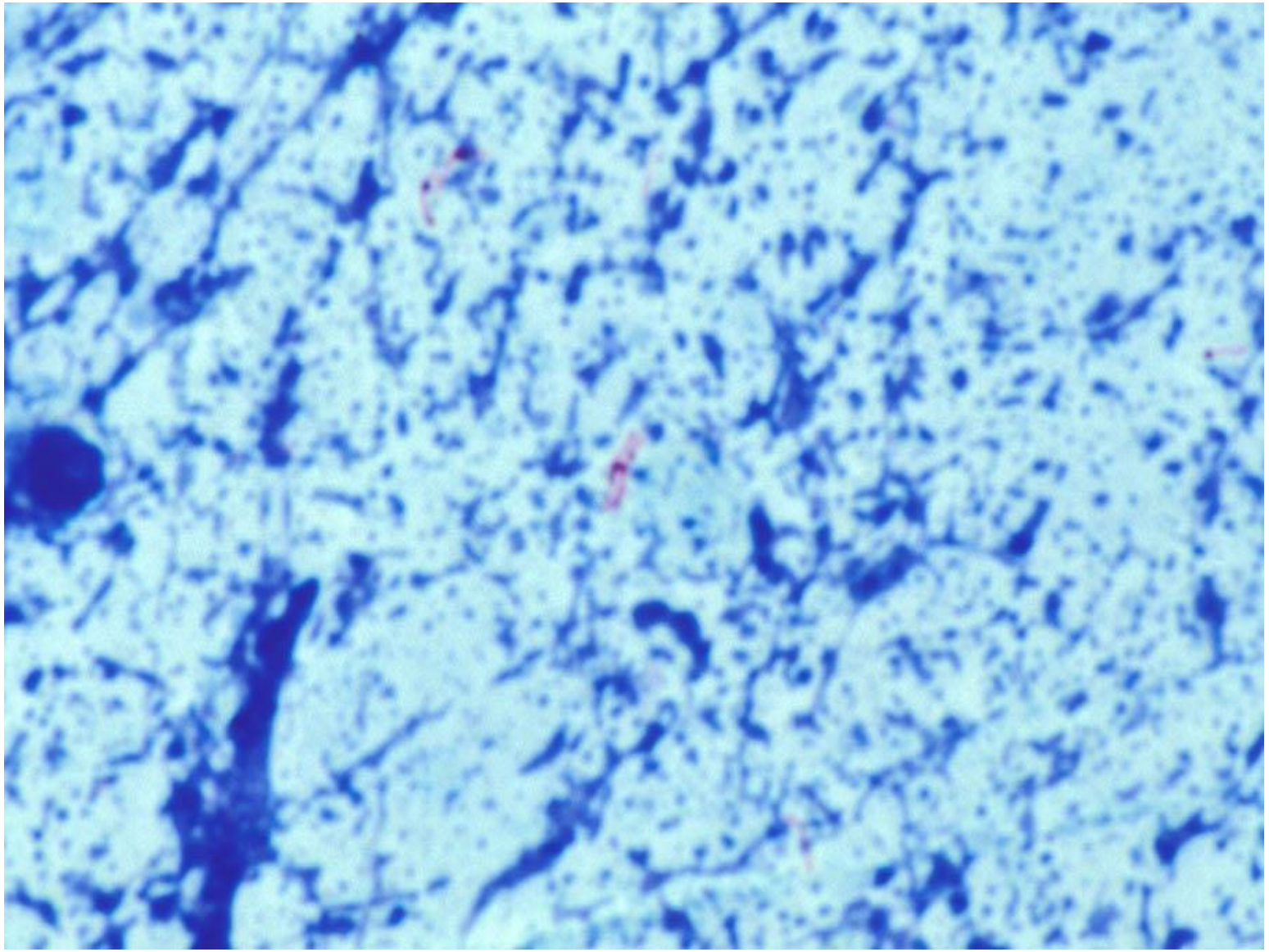
Mycobacterial infections with negative images in Giemsa preparations

Because of significant color fading of Ziehl-Neelsen-stained specimen, power point presentation should be used.

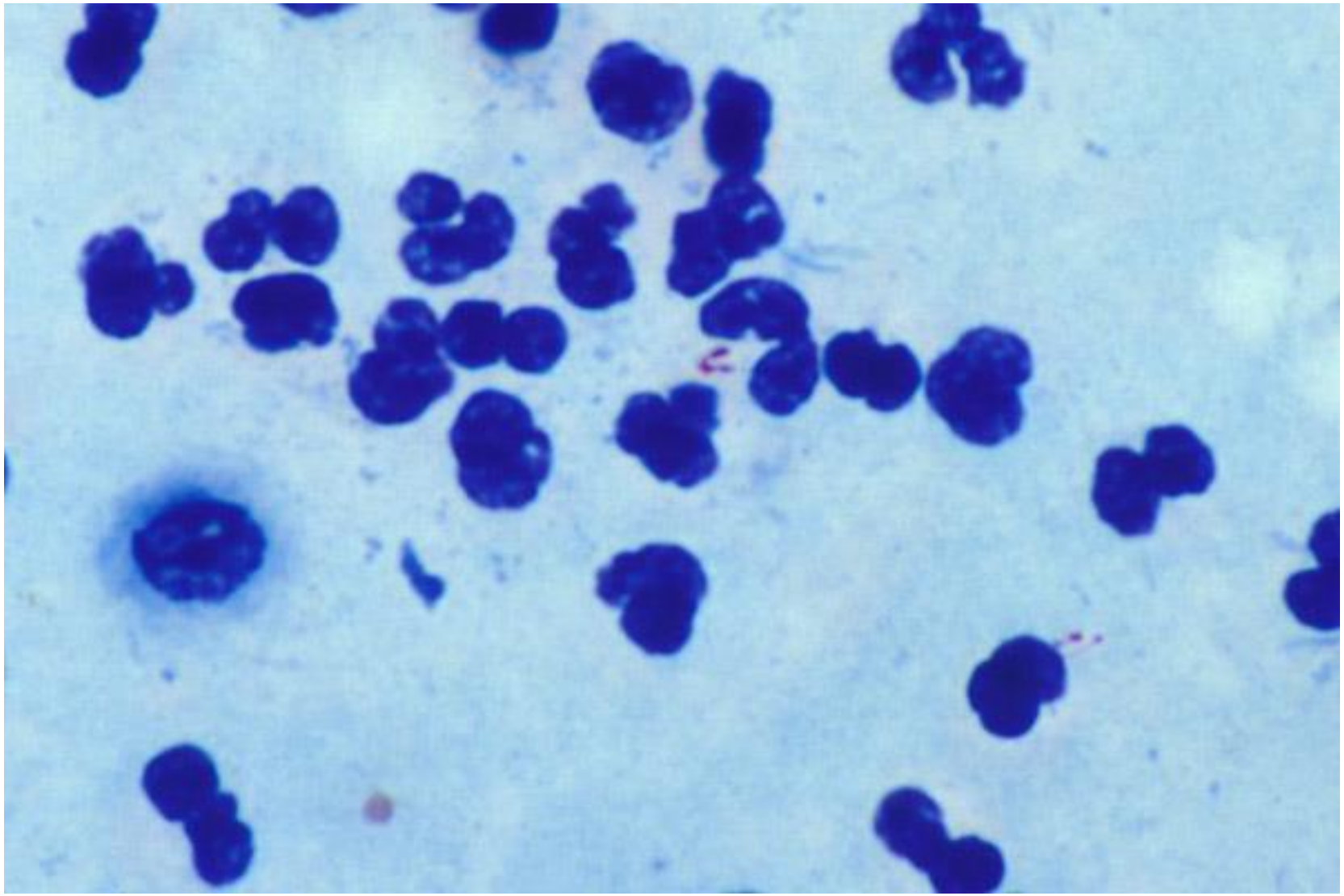
It should be noted that bronchial scraping cytology for the tuberculous lesion may be biohazardous. Particularly if acid-fast bacilli have been detected in the sputum, scraping cytology evaluation must not be performed in order to avoid the biohazard.

Non-tuberculous mycobacteria cannot be distinguished from *M. tuberculosis*. It should be recognized that non-tuberculous mycobacteria do not show human-to-human transmission (not biohazardous).

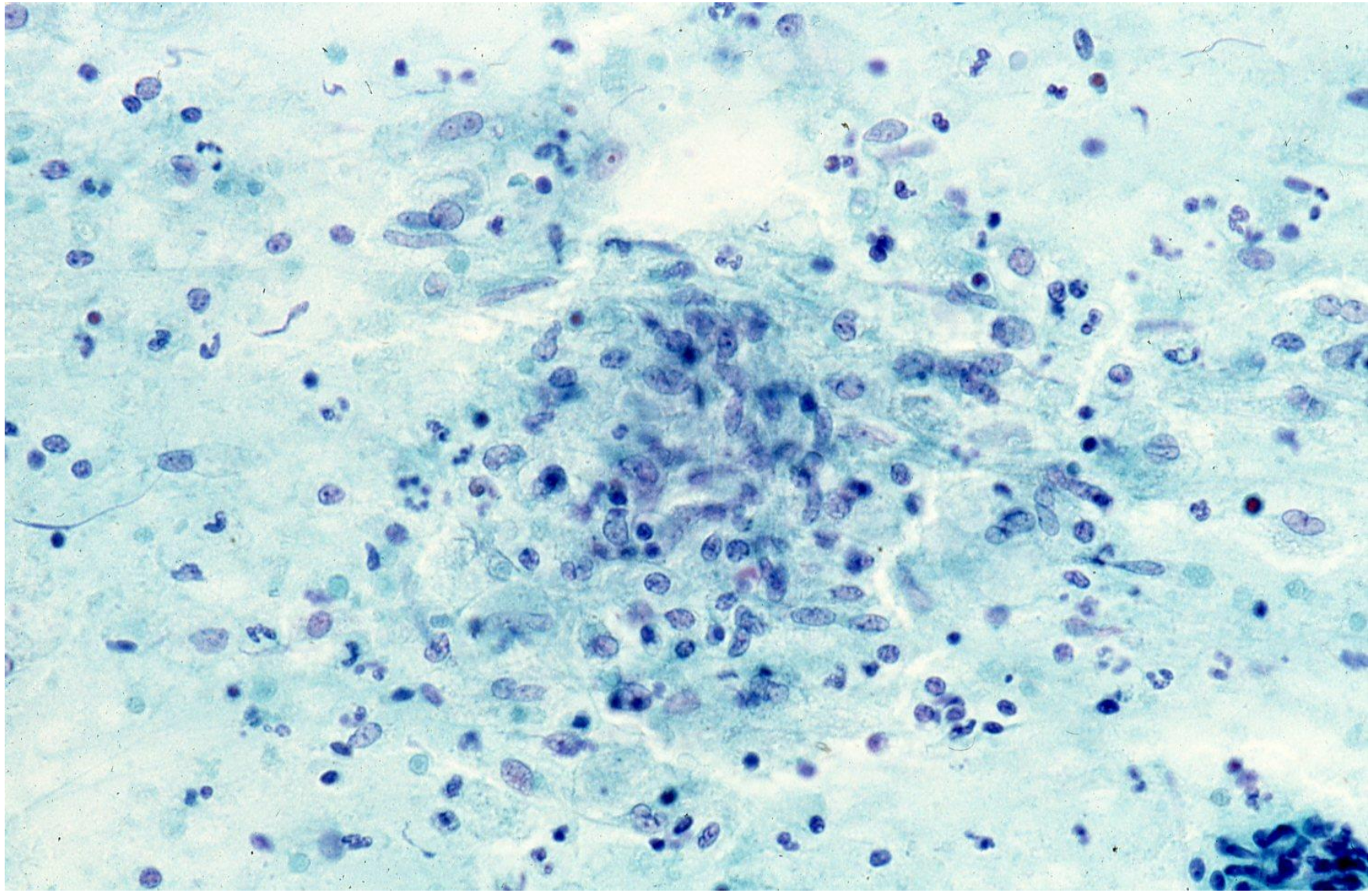
Of note is that acid-fast bacilli show negative images in Giemsa-stained preparations.



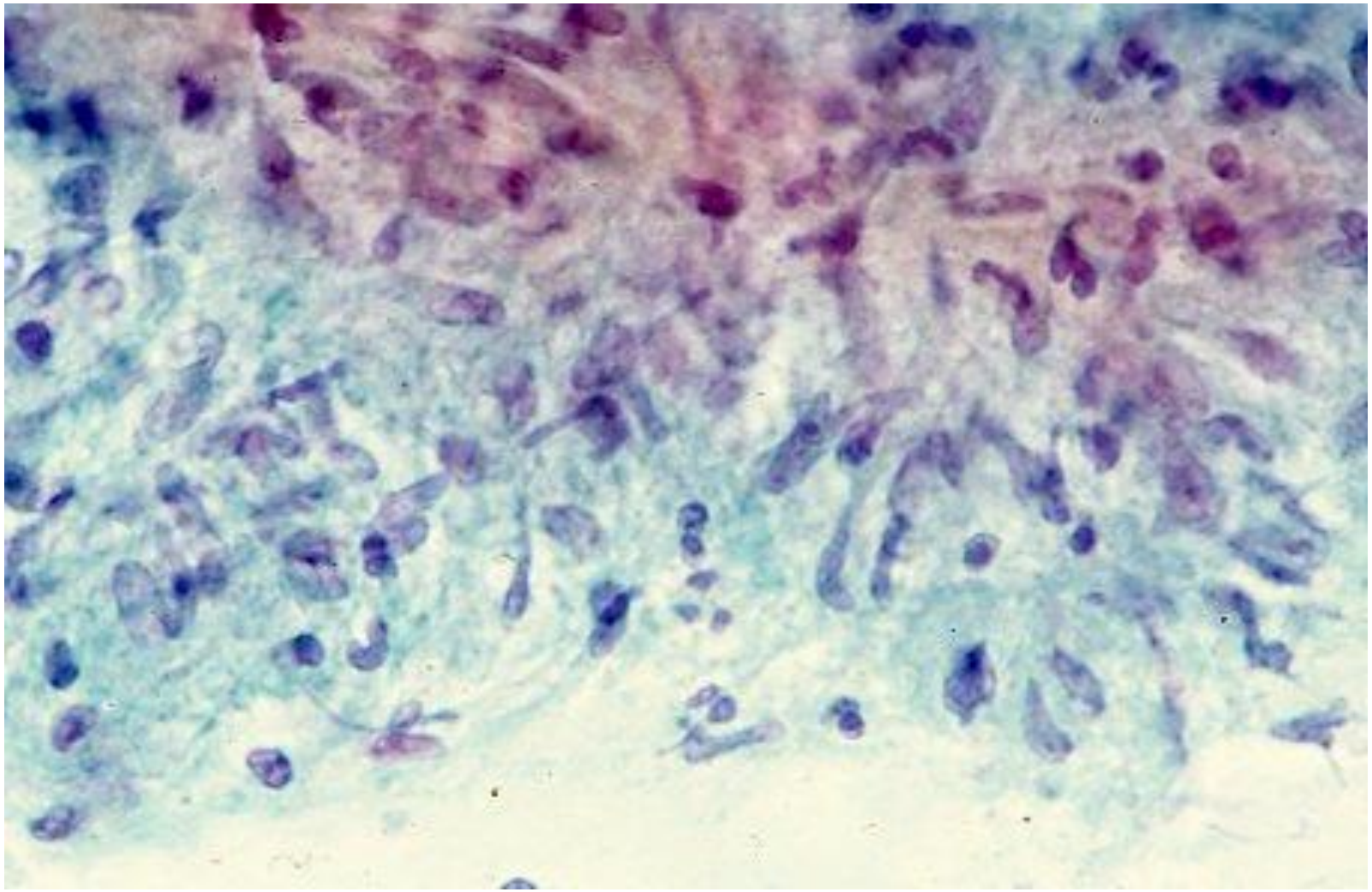
Mycobacterium tuberculosis (40M). A small number of *M. tuberculosis* are observed in the sputum smear preparation. Note red-stained long bacilli. Ziehl-Neelsen-1



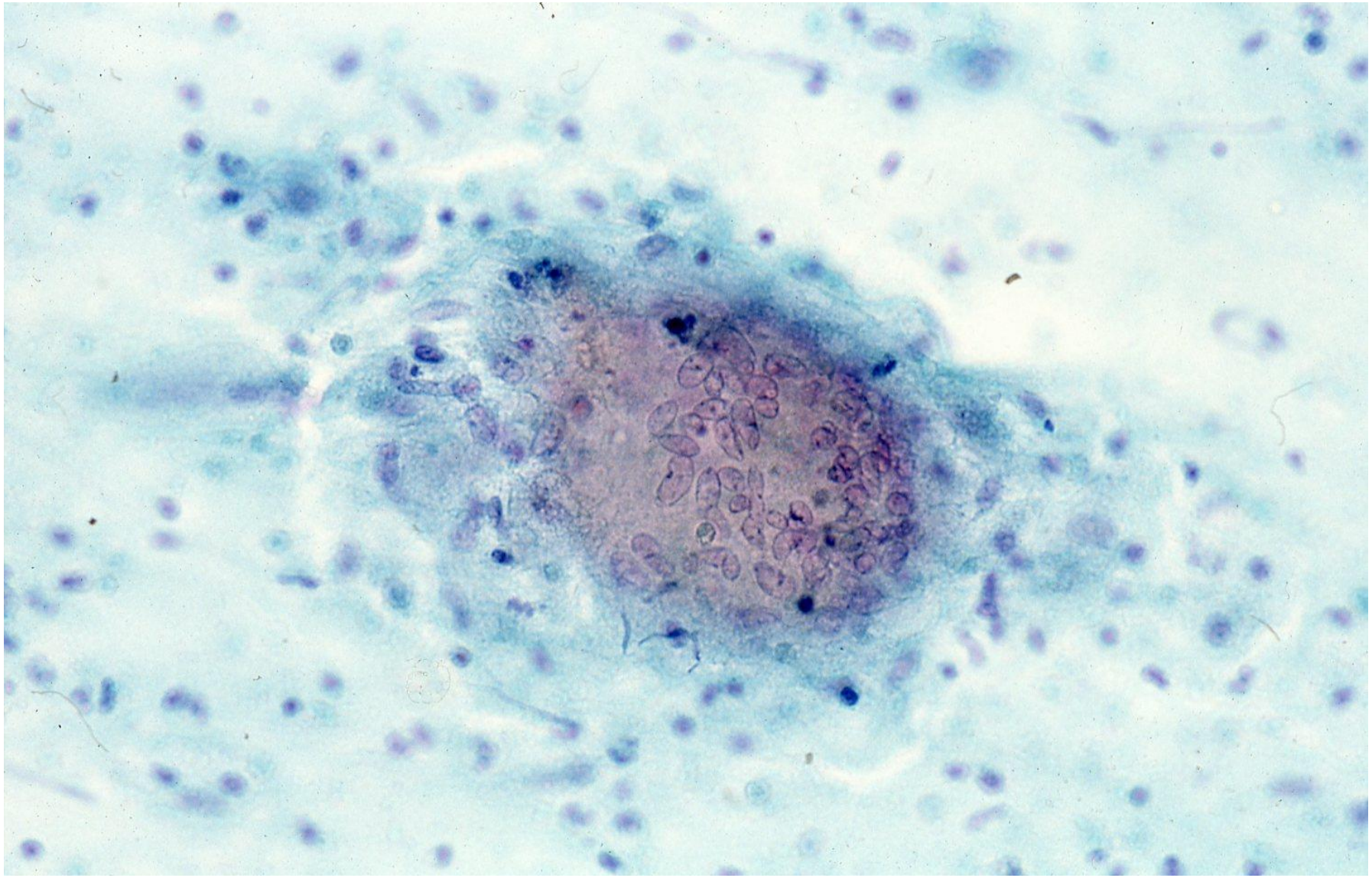
Mycobacterium tuberculosis (50'sM). A small number of *M. tuberculosis* are observed in the sputum smear preparation. Note red-stained long bacilli phagocytized by a macrophage. Ziehl-Neelsen-2



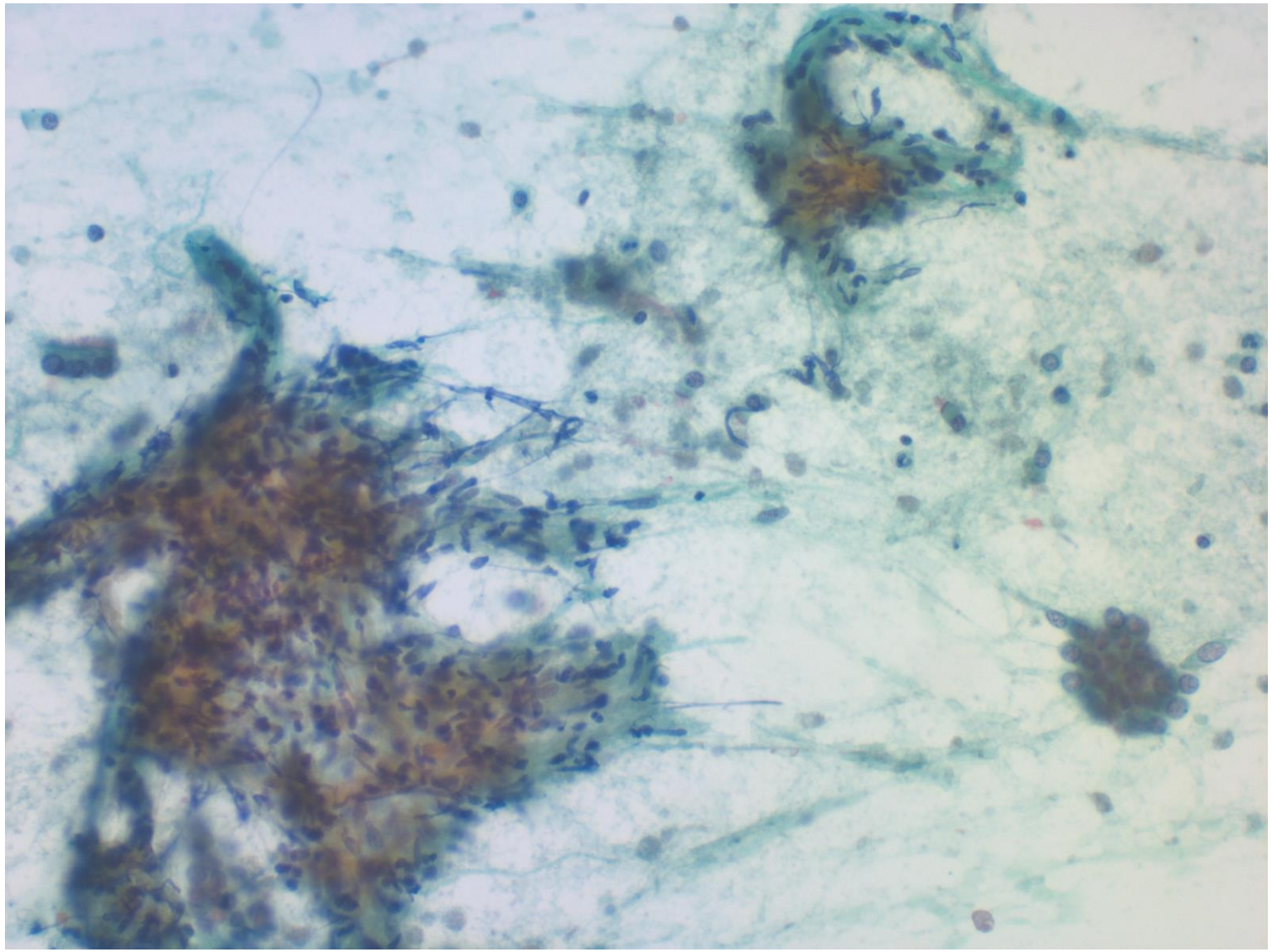
Tuberculosis (40'sM). Bronchial scraping cytology preparation stained with pap. A cluster of epithelioid cells is observed. Pap-1



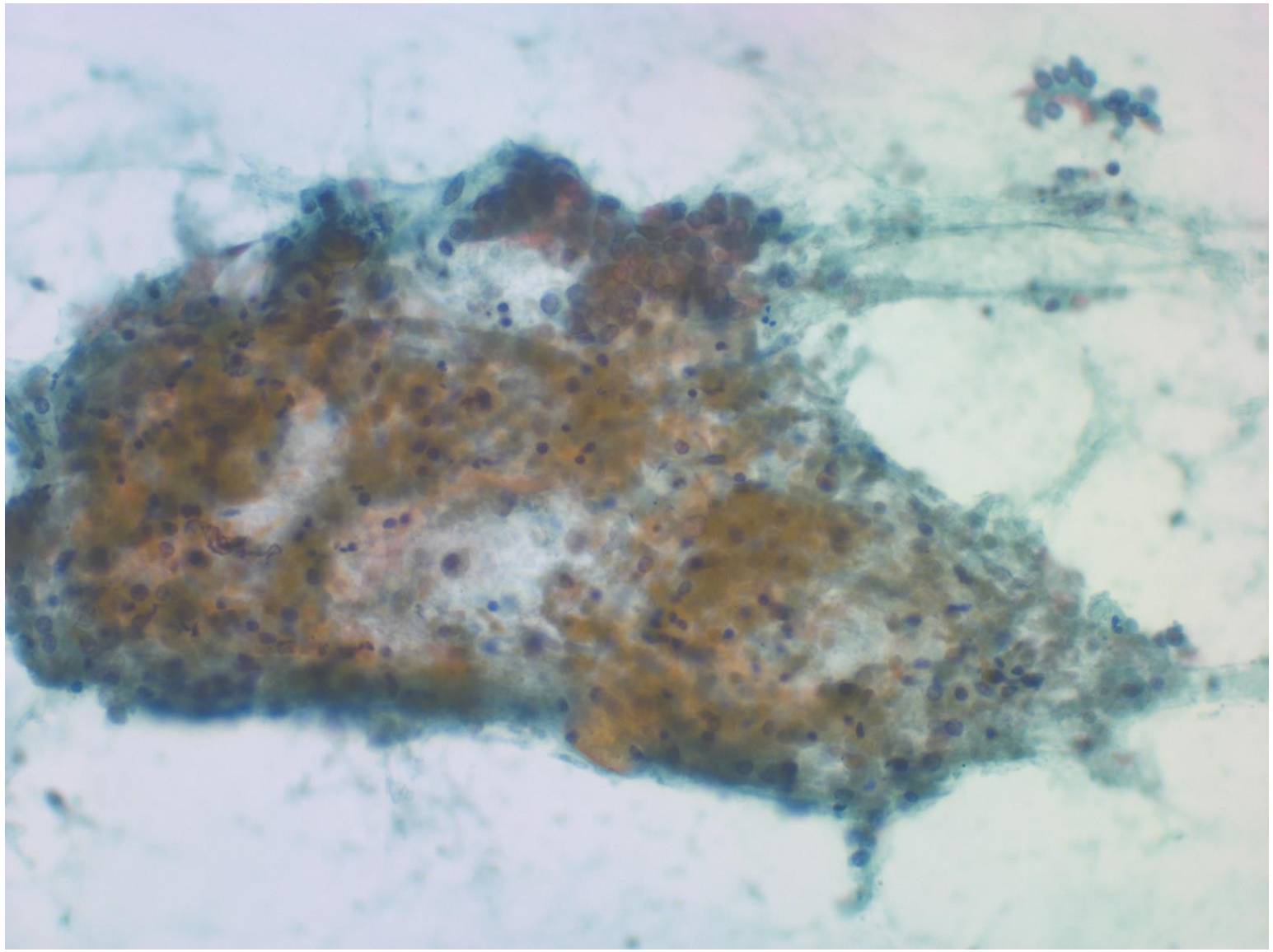
Tuberculosis (40'sM). Bronchial scraping cytology preparation stained with pap. A cluster of epithelioid cells is observed. Pap-2



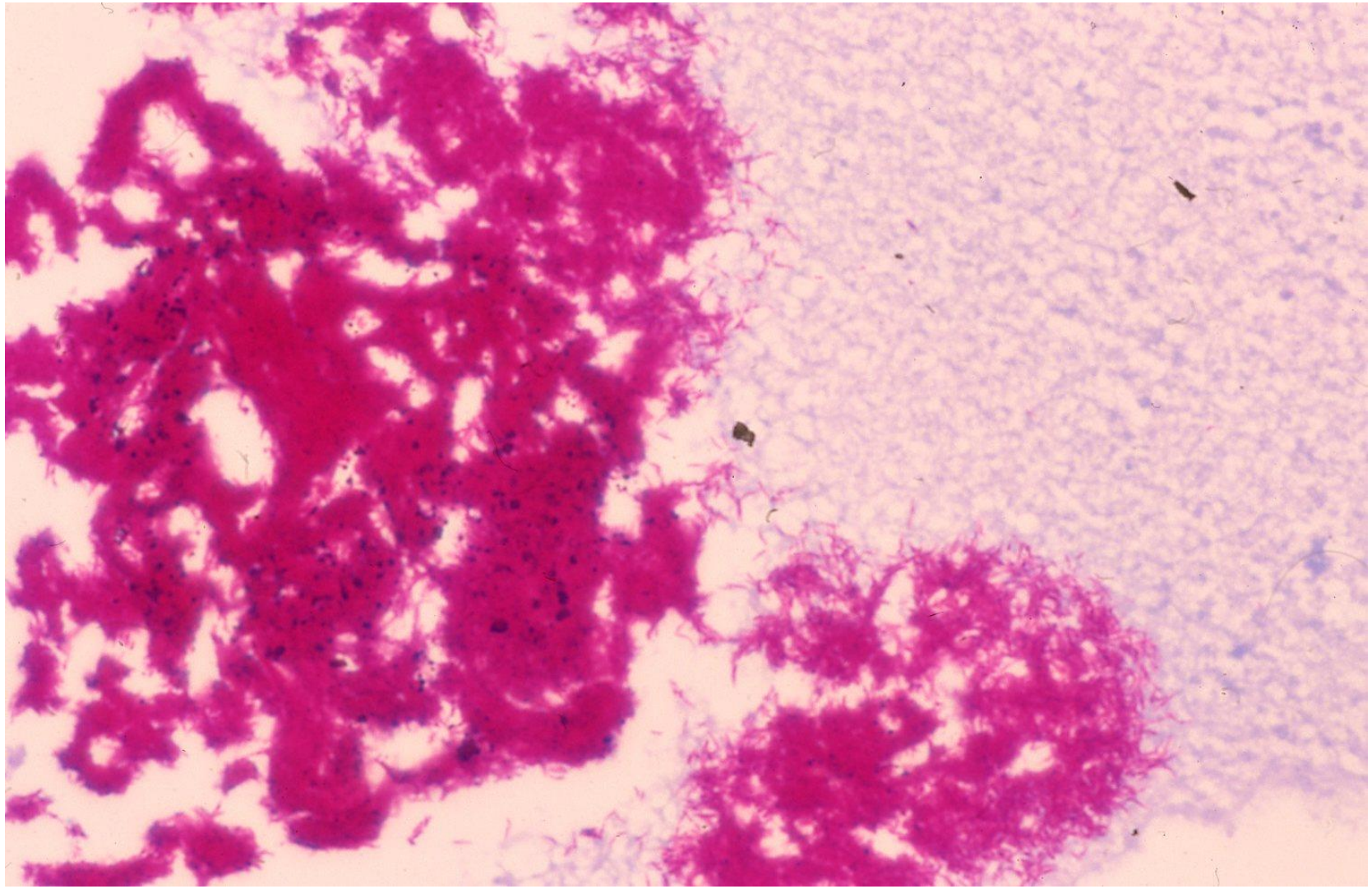
Tuberculosis (40’sM). Bronchial scraping cytology preparation stained with pap. A multinucleated giant cell is seen in the background of epithelioid cells. Pap-3



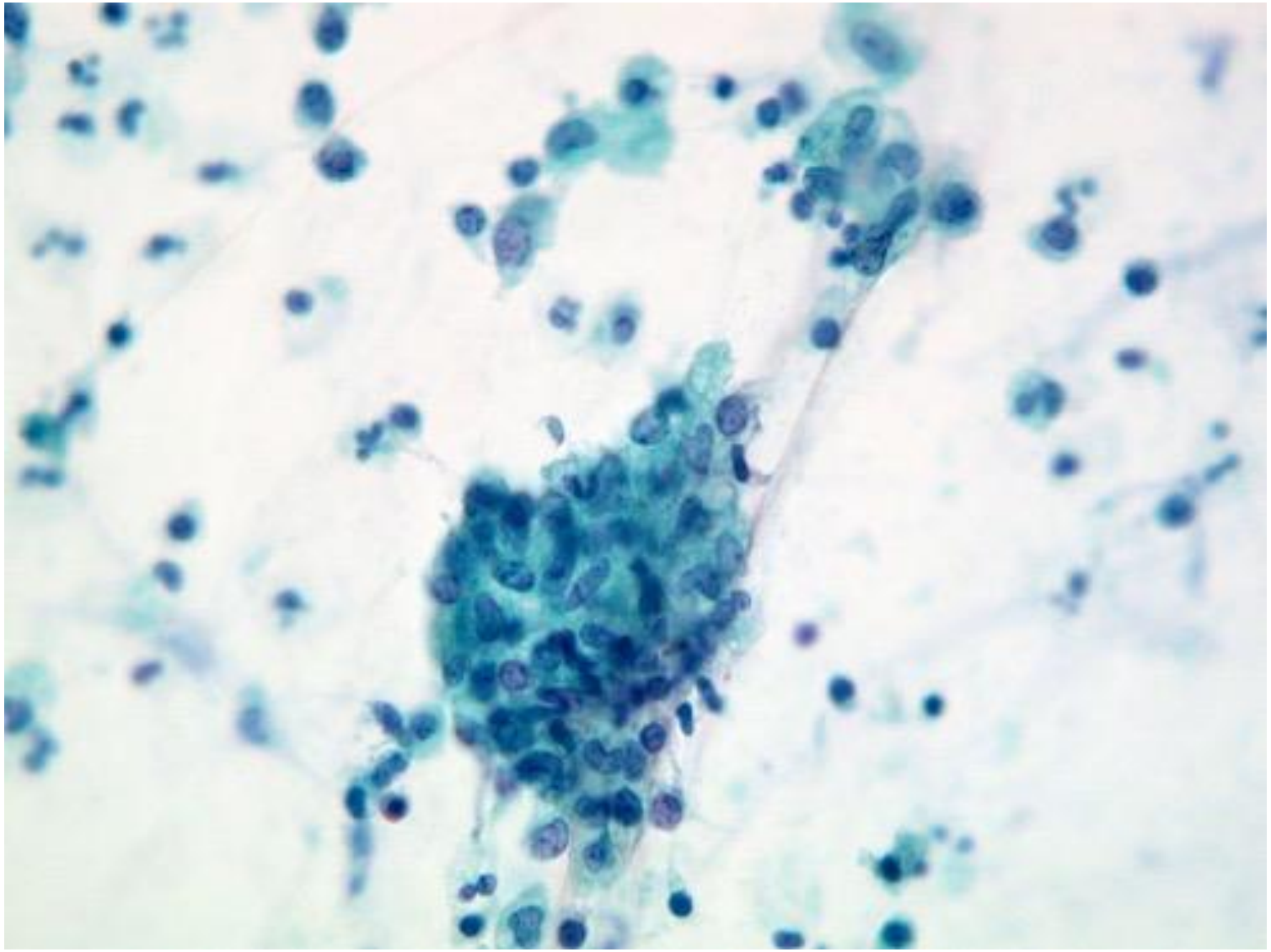
Tuberculosis. Bronchial scraping cytology preparation from another case (50’sM) stained with pap. Clusters of epithelioid cells are seen. Pap-4



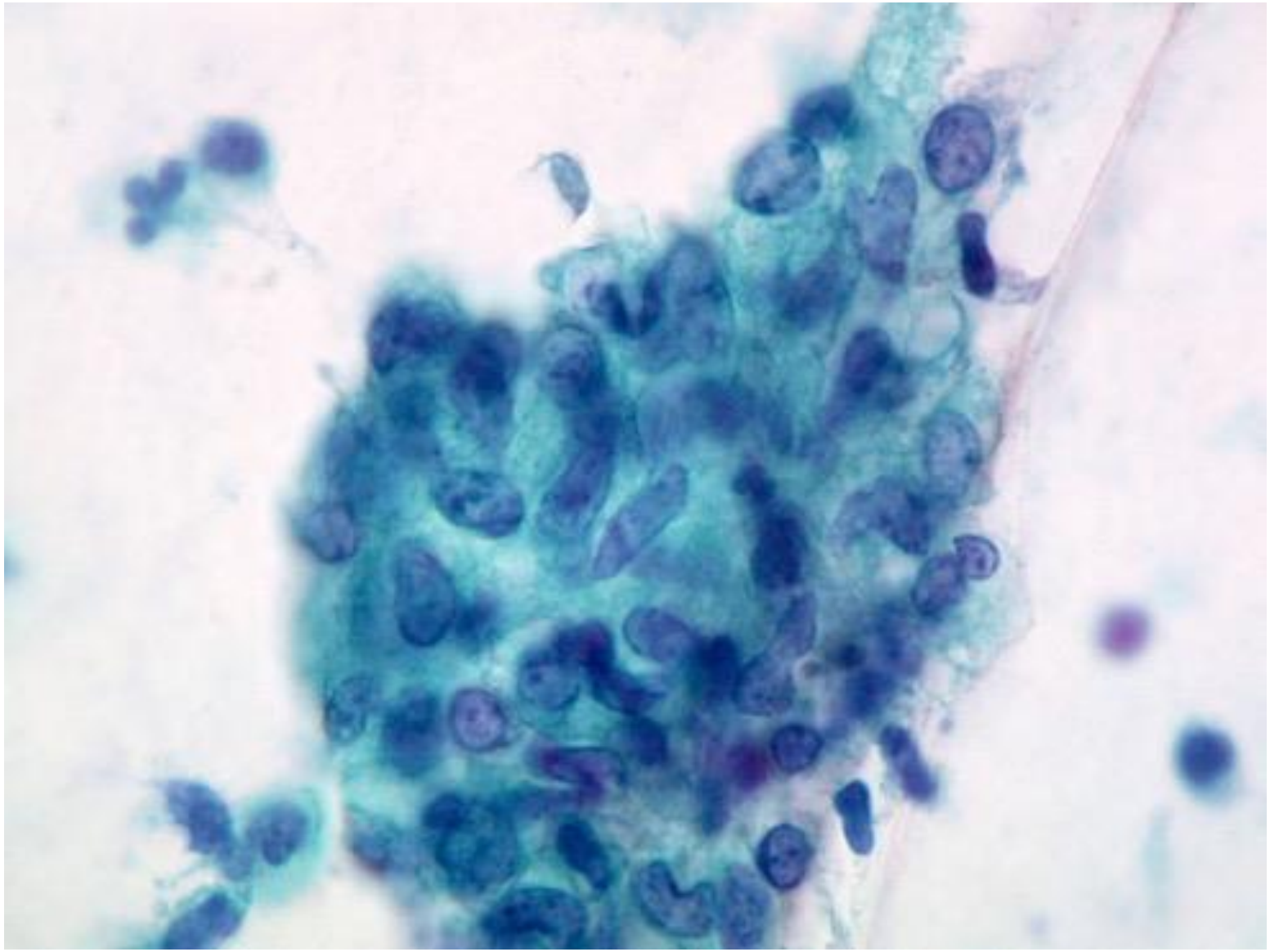
Tuberculosis. Bronchial scraping cytology preparation from another case (50’sM) stained with pap. Clusters of epithelioid cells are seen. Pap-5



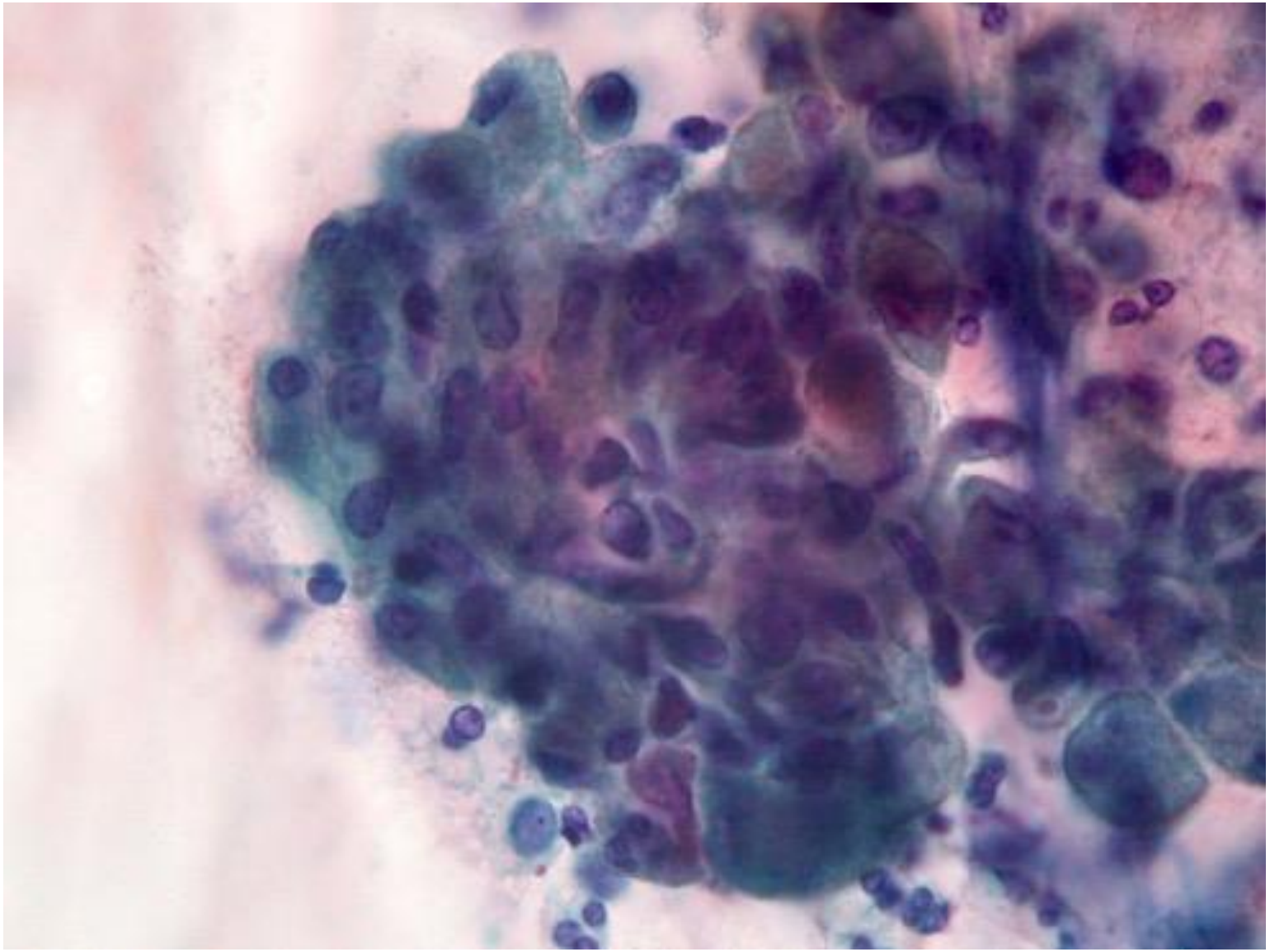
Smear preparation sampled from a colony on the plate of *Mycobacterium tuberculosis*. Acid fastness is evident. Ziehl-Neelsen staining



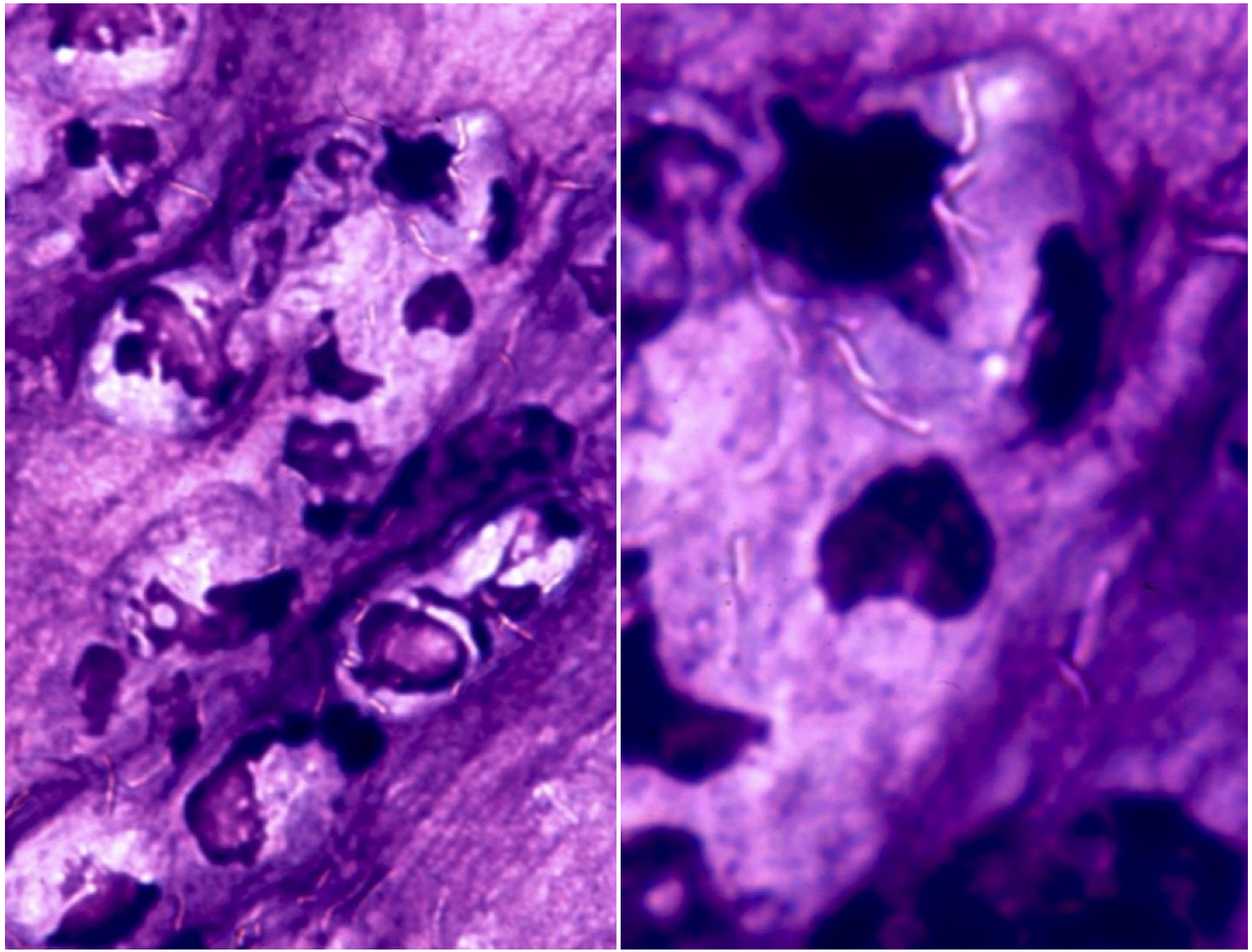
Mycobacterium avium infection (63F). Bronchial scraping cytology preparation stained with pap. Clusters of epithelioid cells are seen. Pap-1



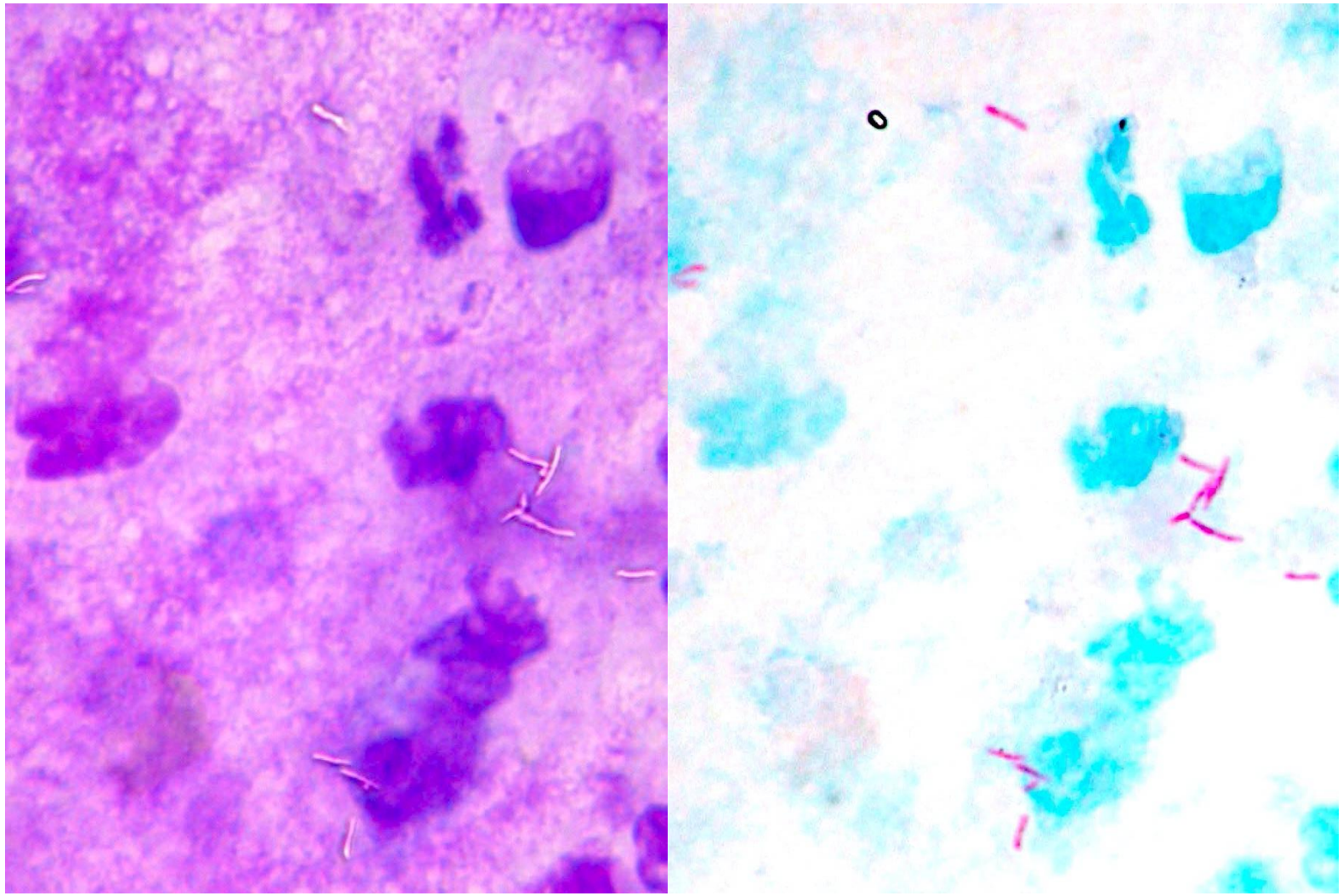
Mycobacterium avium infection (63F). Bronchial scraping cytology preparation stained with pap. Clusters of epithelioid cells are seen. Pap-2



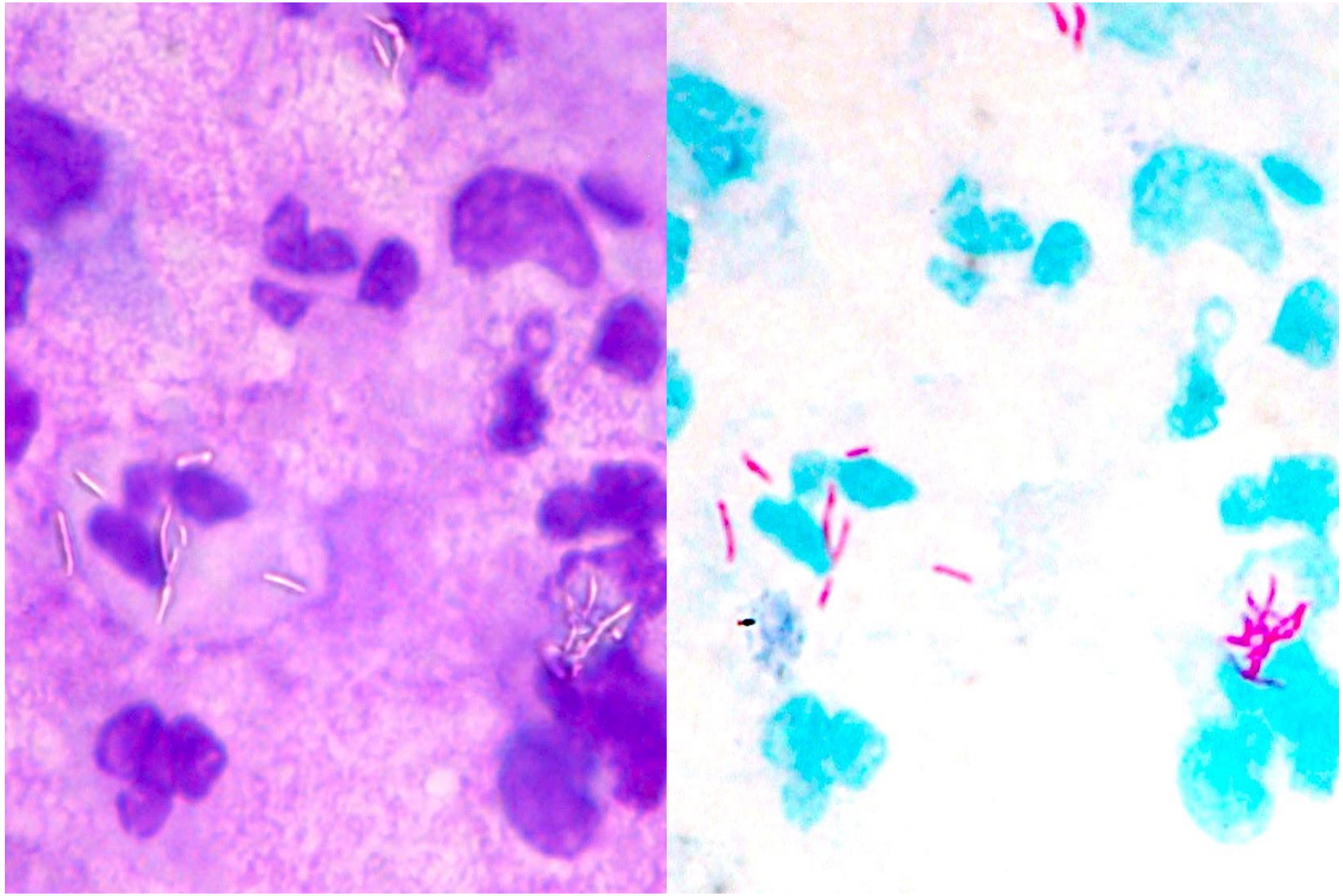
Mycobacterium avium infection (63F). Bronchial scraping cytology preparation stained with pap. Clusters of epithelioid cells are seen. Pap-3



Mycobacterium avium infection (63F). In Giemsa-stained bronchial scraping cytology preparation, negatively stained long bacilli phagocytized by macrophages are observed. Giemsa



Mycobacterium avium infection (63F). In Giemsa-stained bronchial scraping cytology preparation (left), negatively stained long bacilli phagocytized by macrophages are observed. The same preparation was re-stained with Ziehl-Neelsen's staining (right). The negatively stained bacilli reveal distinct acid-fastness. Giemsa and Ziel-Neelsen-1

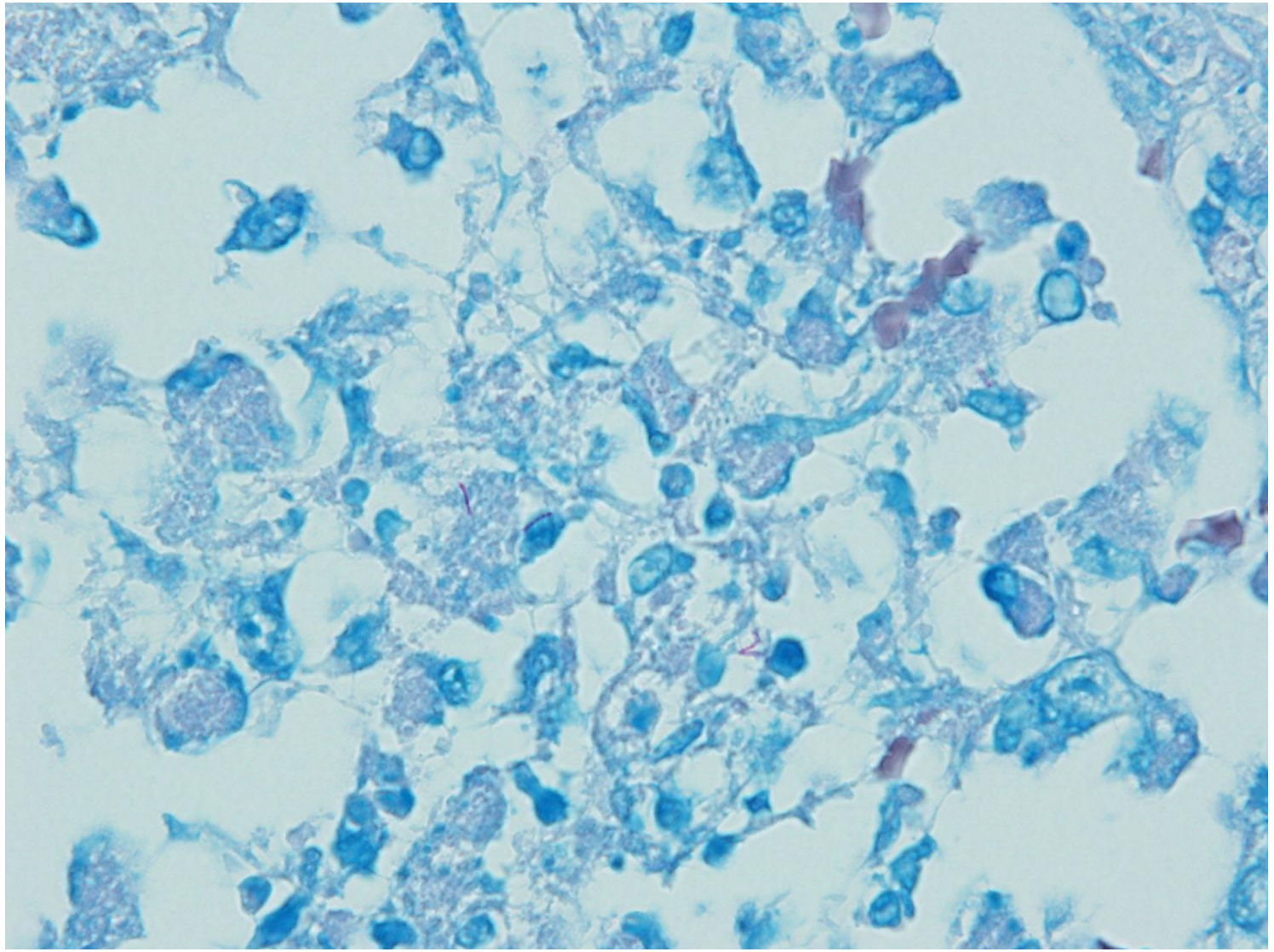


Mycobacterium avium infection (63F). In Giemsa-stained bronchial scraping cytology preparation (left), negatively stained long bacilli phagocytized by macrophages are observed. The same preparation was re-stained with Ziehl-Neelsen's staining (right). The negatively stained bacilli reveal distinct acid-fastness. Giemsa and Ziel-Neelsen-2

Reference:

Tomohiro Watanabe T, Tanaka H, Inaba M, Tsutsumi, Y. *Mycobacterium avium* infection detected as a negative image in Giemsa-stained sputum cytology preparation. Ann Infect Dis Ther 2021; 2(1): 01-05.

A borderline-diabetic 63-year-old housewife, a human T-cell leukemia virus-1 carrier, complained of fever and coughing. Computed tomography scan identified a 50 mm-sized, cavitated mass in the lower lobe of the right lung. To evaluate the nature of the lesion, cytological screening was performed. Giemsa-stained sputum cytology was quite effective for identifying mycobacteria as negative (unstained) bacillary images in the cytoplasm of many neutrophils and some macrophages. A re-staining technique clearly demonstrated acid-fastness of the ghosted rods. Microbial culture and real-time polymerase chain reaction analysis confirmed infection of *Mycobacterium avium*. It is necessary for us to employ Giemsa stain in sputum cytology, particularly when lung infection is clinically suspected.



Ziehl-Neelsen staining on a histological section of lung tuberculosis (60’sM). A few acid-fast bacilli are detectable in the granulomatous lesion. Ziehl-Neelsen