

necrosis. Tubercle bacilli, either free or within phagocytes, drain to the regional nodes, which also often caseate. **This combination of parenchymal lung lesion and nodal involvement is referred to as the Ghon complex (Fig. 8-26).** During the first few weeks there is also lymphatic and hematogenous dissemination to other parts of the body. In approximately 95% of cases, development of cell-mediated immunity controls the infection. Hence, the Ghon complex undergoes progressive fibrosis, often followed by radiologically detectable calcification (Ranke complex), and despite seeding of other organs, no lesions develop.

Histologically, sites of active involvement are marked by a characteristic granulomatous inflammatory reaction that forms both caseating and noncaseating tubercles (Fig. 8-27A to C). Individual tubercles are microscopic; it is only when multiple granulomas coalesce that they become macroscopically visible. The granulomas are usually enclosed within a fibroblastic rim punctuated by lymphocytes. Multinucleated giant cells are present in the granulomas. Immunocompromised people do not form the characteristic granulomas and their macrophages contain many bacilli (Fig. 8-27D).

Secondary Tuberculosis. The initial lesion is usually a small focus of consolidation, less than 2 cm in diameter, within 1 to 2 cm of the apical pleura. Such foci are sharply circumscribed,

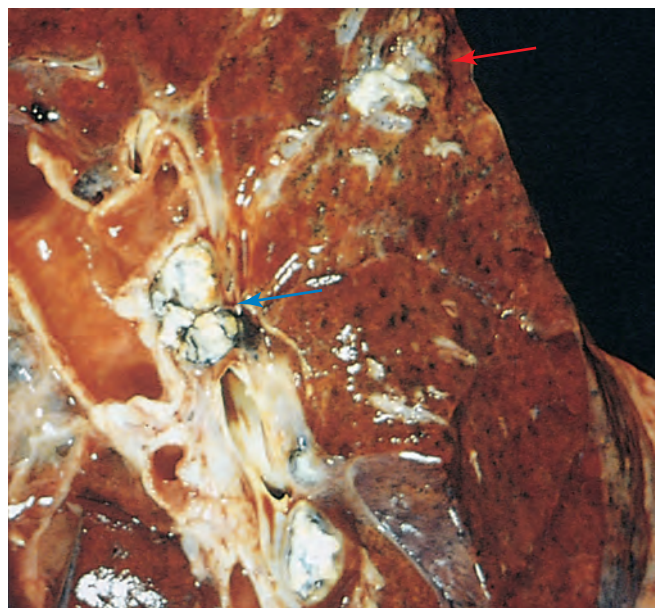


Figure 8-26 Primary pulmonary tuberculosis, Ghon complex. The gray-white parenchymal focus is under the pleura in the lower part of the upper lobe (red arrow). Hilar lymph nodes with caseation are seen on the left (blue arrow).

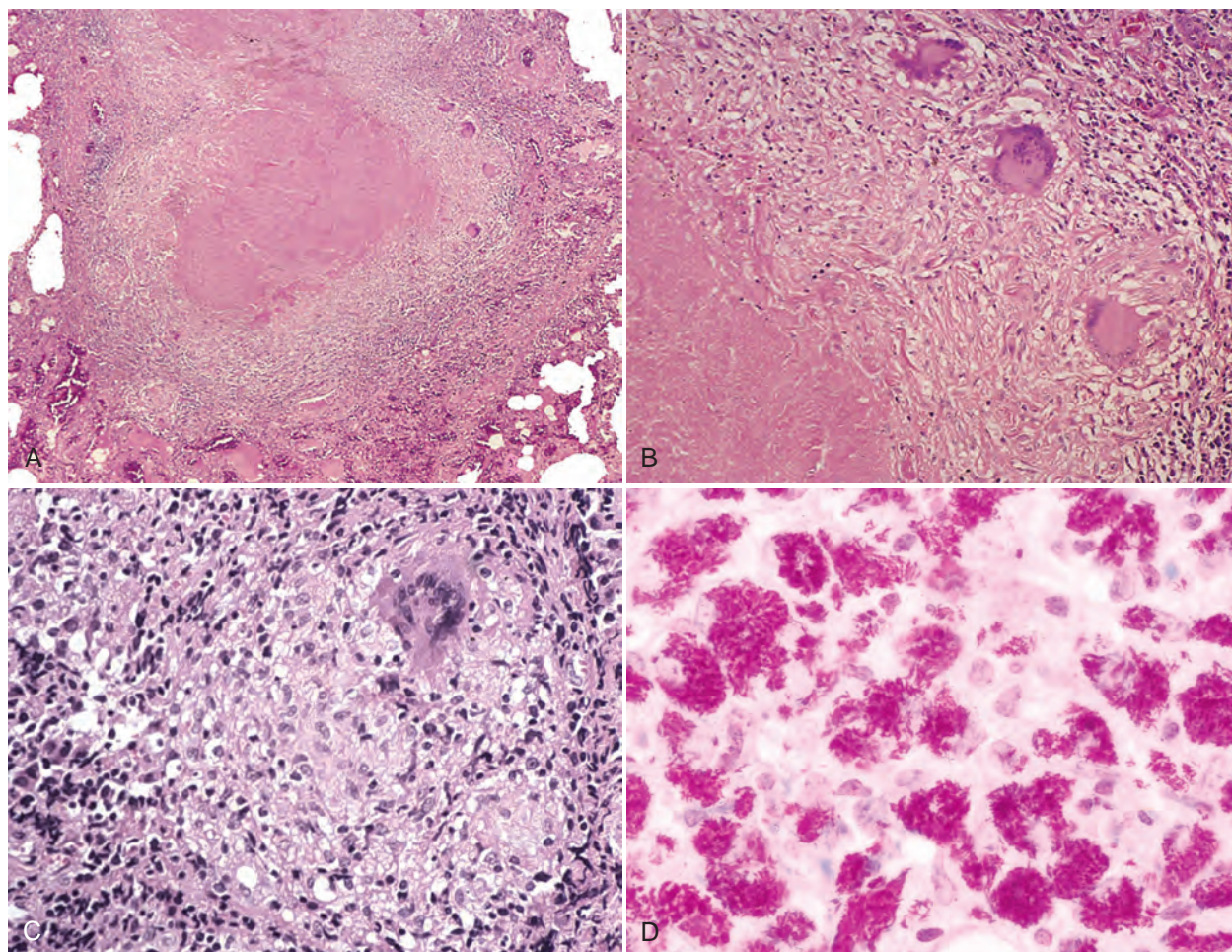


Figure 8-27 The morphologic spectrum of tuberculosis. Characteristic tubercle at low magnification (A) and high magnification (B) shows central granular caseation surrounded by epithelioid and multinucleate giant cells. This is the usual response in people who have developed cell-mediated immunity to the organism. Inset: Acid-fast stain shows rare positive (red) organisms. C, Occasionally, even in immunocompetent patients, tubercular granulomas may not show central caseation; hence regardless of the presence or absence of caseous necrosis, use of special stain for acid-fast organisms is indicated when granulomas are present. D, In this specimen from an immunocompromised patient, sheets of foamy macrophages packed with mycobacteria are seen (acid-fast stain).