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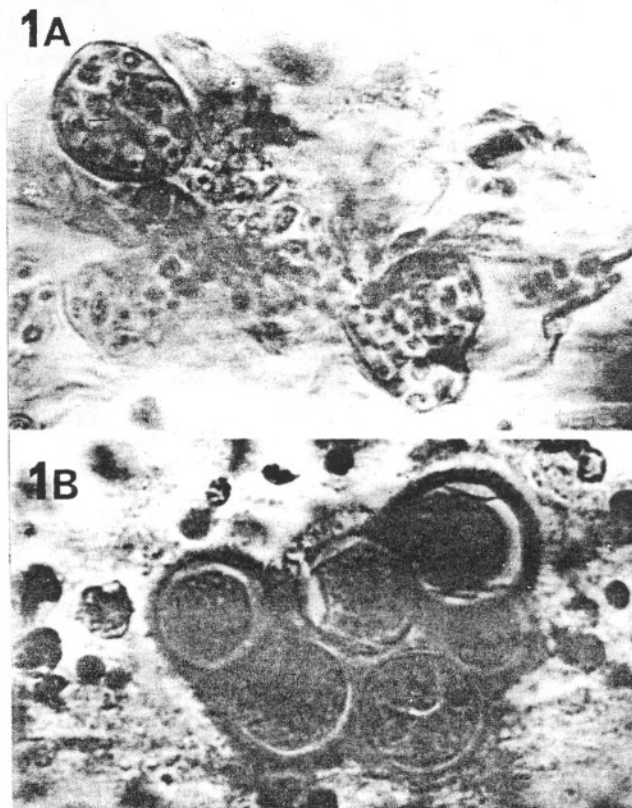
Coccidioidomycosis Versus Pollen

To the Editor: In our Maryland laboratory, we recently encountered two separate cases of sputum containing membrane-bound granules morphologically suggestive of *Coccidioides immitis*. After rather extensive laboratory and clinical work-up, one specimen showed active coccidioidomycosis and the other showed only pollen. In both of these cases, preliminary expert consultation failed to achieve a diagnosis based on morphology alone. A retrospective side-by-side comparison demonstrated the clear morphologic distinction between pollen and *C immitis*.

Case 1. A 50-year-old man was seen in August with a four-day history of weakness and myalgia. A chest x-ray film showed an infiltrate in the right upper lobe. Sputum specimens contained spherical particles enclosing round structures resembling endospores (Figure, A). The patient had no history of recent or past travel to an endemic area and no past history of coccidioidomycosis. Sputum cultures were negative for *C immitis*. *Coccidioides* complement fixation titer was 1:2, and latex agglutination and immunodiffusion assays were negative for *C immitis*. Treatment with clindamycin resulted in clinical improvement, with resolution of the pulmonary infiltrate.

Case 2. A 52-year-old black man with stage D carcinoma of the prostate diagnosed in 1986 had a progressive two-month history of increasing shortness of breath and worsening productive cough. He had been treated with diethylstilbestrol (3 mg/day) and dexamethasone (10 mg/day) over the past year for metastatic involvement of vertebrae. A chest film showed a reticular nodular pattern primarily in the upper lobes. The clinical impression at that time was disseminated prostatic carcinoma with metastases to the lungs. Sputum was negative for malignant cells, but spherical particles containing small round bodies suggestive of endospores were noted (Figure, B). The patient had no history of previous pulmonary infection and had been in an endemic region only once, during several months of military service in New Mexico in 1958. Sputum cultures for *C immitis* were positive and complement fixation titers were 1:1,024 (markedly positive) for *Coccidioides* antibody. Itraconazole therapy produced clinical improvement, with significant resolution of infiltrates.

Comment. In sputum, pollen granules can closely mimic *C immitis*.¹ Pollen freshly captured from ambient air is morphologically dissimilar to pollen seen in sputum. In the fresh state, pollen has a relatively hard and opaque outer wall, and individual species of pollen are identified by morphologic features of the wall surface (eg, number of apertures and presence of spines, tubers, or warts).^{2,3} In sputum, pollen walls are apparently partially digested, creating round, lucent grains with easily visualized cytoplasmic bodies (Figure, A). In sputum, it can be difficult or impossible to identify the pollen species. In our Maryland laboratory, pollens are frequently seen in sputum specimens during all but the winter months. They vary in size from about 20 to 80 μ . They differ morphologically from *C immitis* by the absence of a refractile



(A) (Case 1) Pollen grains, showing thin wall and wedging. (B) (Case 2) Six *Coccidioides immitis* organisms engulfed by macrophage. Notice variation in morphology of endospores from organism to organism and refractile capsules. (Papanicolaou's stain, original magnification \times 730)

wall, the presence of wedges (seen as indentations), and the presence of uniform round to oval cytoplasmic bodies. *Coccidioides immitis* is round with a refractile wall enclosing endospores of variable size and shape (Figure, B). In the examples shown, both organisms are about 25 μ in diameter. *C immitis* is usually present within an inflammatory background, often engulfed by macrophages. In Maryland, the task of distinguishing these morphologically similar but clinically disparate organisms is a frequent problem. These side-by-side case illustrations provide useful standards by which to reach the correct diagnosis.

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