Conidiobolus incongruus pneumonia in a sow

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In October 2006, a 2-year old Yorkshire sow from a small swine herd in the State of California was submitted to the UC Davis CAHFS Davis Lab for necropsy. This animal had a clinical history of respiratory distress of 2 weeks duration. At necropsy, there was a hard, well-circumscribed, round mass approximately 30 cm in diameter replacing most of the left diaphragmatic lung lobe, and surrounded by a thick, fibrous, white, shaggy capsule. This mass had a homogeneous, light brown cut surface with some cystic, cavernous areas 0.5-2 cm scattered throughout. Attached to the external, capsular surface of the larger, firm mass there was a multilocular, elongated mass formed by many thin-walled cysts 0.5-1.5 cm in diameter filled with yellow or green colloid, or yellow friable material. Severe subpleural and interlobular edema were present in the remaining parenchyma from this lung lobe. Marked pleural effusion was also noted. Histologically, the larger lung mass consisted of abundant, well-vascularized, dense fibrous connective tissue with multifocal to coalescing discrete foci composed mostly of large numbers of necrotic eosinophils which surrounded numerous hyphae. These intralesional fungal elements, unstained on HE but GMS positive, were irregularly shaped, short or elongated, had non-parallel, thin walls, were infrequently and randomly branched, were occasionally septate, and had bulbous enlargements. This mass was walled off from an adjacent rim of pulmonary parenchyma by a thick, avascular fibrous capsule. DNA was extracted from a frozen sample of this lung mass, and a PCR reaction was run with primers directed to the 5' end of the 28S rRNA gene. Sequence analysis was performed on the amplified product which showed greater than 99% homology with the fungus Conidiobolus incongruus. No significant microorganisms were cultured from a fresh sample of this lung mass.

Conidiobolomycosis is a highly invasive zygomycosis caused by fungi of the genus Conidiobolus, class Zygomycetes, order Entomophthorales. It has been reported worldwide (e.g. in Australia, Canada, USA, India, Africa, and Brazil) as a cause of skin, respiratory, or generalized disease affecting humans and animals (sheep, dogs, horses, llamas, and deer). Species of Conidiobolus are C. coronatus, C. incongruus, and C. lamprauges. Conidiobolus is present in soil, decaying vegetation, and insects in tropical and subtropical areas. Cases of zygomycosis have been reported in swine causing lymphadenitis, gastrointestinal disease, or disseminated infection, and include proven cases of mucormycosis by Absidia and Rhizopus, and presumed but not confirmed cases of entomophthoramycosis by Conidiobolus or Basidiobolus. To the authors’ knowledge, this is the first confirmed case of conidiobolomycosis in a pig with Conidiobolus incongruus being identified by PCR. A literature review failed to reveal any published reports of conidiobolomycosis by C. incongruus in swine. In the US, there are only two reports of C. incongruus infection – one in a white-tailed deer (with a lung mass resulting in hypertrophic osteopathy), and one in a granulocytopenic person (with pulmonary and pericardial disease).

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References: