In human case-patients, the first-choice therapy is to remove the worms mechanically by flushing the conjunctival sac with sterile physiologic saline under local anesthesia (Appendix reference 12).

From a therapeutic and epidemiologic standpoint, it is important to differentiate between infectious and allergic conjunctivitis. Furthermore, diagnosis can be difficult because immature larvae can hide in the excretory ducts of the lacrimal glands (7). Our findings indicate the need for education and raised awareness about this infection especially for ophthalmologists. Early and adequate diagnosis can help to prevent complications such as corneal ulceration.

About the Author
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References

Severe Human Case of Zoonotic Infection with Swine-Origin Influenza A Virus, Denmark, 2021

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During routine surveillance at the National Influenza Center, Denmark, we detected a zoonotic swine influenza A virus in a patient who became severely ill. We describe the clinical picture and the genetic characterization of this variant virus, which is distinct from another variant found previously in Denmark.
Human infections with swine influenza A viruses (IAVs) are sporadically reported (1–4). Increased surveillance has revealed substantial swine IAV circulation within pig herds and frequent reassortment with human seasonal IAVs (5). Despite no sustained human-to-human transmission of variant IAV cases since the 2009 influenza A(H1N1) pandemic, the zoonotic potential is of concern. We report a case of human infection with a swine-origin IAV that resulted in severe illness in a younger, otherwise healthy person employed at a swine slaughterhouse in Denmark. This case was detected 10 months after our previously reported case (4). The patient provided informed consent for publication of this case report.

On November 24, 2021, a person of ≈50 years of age was hospitalized after acute onset of illness characterized by dizziness on the night of November 23, 2021, followed by chest pain, pain radiating toward the left arm, diarrhea, and malaise that developed the next morning, but no fever. The patient called for emergency medical assistance, which arrived shortly. During ambulance transportation and at hospital arrival, the patient experienced repeated convulsions and was admitted to the intensive care unit and put on mechanical ventilation to manage seizures and associated reduced oxygen level. Extensive clinical examination, such as laboratory investigations (i.e., biochemical, microbiological, and immunological assays), multiorgan radiological examinations, and electroencephalography (Appendix 1, https://wwwnc.cdc.gov/EID/article/28/12/22-0935-App1.pdf), identified no cardiovascular, renal,
The remaining sample material was submitted to the Danish National Influenza Center as part of routine influenza surveillance. The sample was confirmed positive for the pandemic H1N1 strain and was further analyzed by whole-genome sequencing (Appendix 1). Consensus sequences for the virus named A/Denmark/36/2021 were uploaded to GISAID (https://www.gisaid.org; isolate no. EPI-ISL_517733; Appendix 2, https://wwwnc.cdc.gov/EID/article/28/12/22-0935-App2.xlsx); strains from passive surveillance Denmark: A/swine/Denmark/S19922/2021 (GenBank accession nos. ON716267–74); and another recent variant case found in Denmark (A/Denmark/1/2021; GISAID isolate no. EPI_ISL_909652) (4). The A/swine/Denmark/S22282/5/2021 is of the H1N2 subtype and therefore no percentage similarity is reported to the neuraminidase gene segment and protein of this strain. HA, hemagglutinin; MP/M1/M2, matrix protein 1/2; NA, neuraminidase; n/a, not applicable; NEP, nuclear export protein; NP, nucleoprotein; NS/NS1, nonstructural protein; PA, polymerase acidic protein; PB1/2, polymerase basic protein 1/2.

**Table.** Percentage nucleotide and amino acid identities between influenza A virus from a patient in Denmark (A/Denmark/36/2021), the seasonal vaccine strain, and closely related strains*

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</table>

Pairwise nucleotide identity to A/Denmark/36/2021, %

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Pairwise amino acid identity to A/Denmark/36/2021, %

 analyses showed that most gene segments were related to the pandemic H1N1 subtype (clade 1A3.3.2), whereas the neuraminidase and nonstructural segments belonged to the clade 1C Eurasian avian-like swine influenza A (H1N1) (Figure; Appendix 1 Figures 1–7). In contrast, another variant virus found recently in Denmark had a clade 1C nonstructural segment, whereas the 7 other gene segments were related to clade 1A3.3.2 pandemic H1N1 viruses (4). In-depth interviews with the patient revealed occupational exposure to swine in a pig slaughterhouse in Denmark, which appears the most likely place of infection. The patient handled live pigs, carcasses, and meat during the slaughtering process while wearing protective equipment including gloves and gown but no face mask. The patient was previously healthy, had no underlying diseases or immune deficiencies, and had received the recommended quadrivalent seasonal influenza vaccine in October 2021.

No other cases of influenza had been reported at the patient’s workplace or among close contacts. In the 2021–22 influenza season, 16,160 cases of influenza A virus occurred among 244,184 tested samples in Denmark; the H3N2 subtype was dominant. No other human cases of swine-origin influenza virus were detected during this period. Genetic analyses and antigenic characterization of the virus (Appendix 1 Table 1, Figure 8) showed
several genetic and antigenic differences and suggested poor reactivity to the contemporary human seasonal influenza vaccine.

This reported case is considered independent of the previously reported variant infection in Denmark (4), because the 2 viruses are genetically distinct (Table). The symptoms were also different; the earlier case was in an elderly patient with comorbidities who experienced classical influenza-like illness, but in this case, a previously healthy adult of younger age experienced unusual severe and sudden illness. Influenza-associated convulsions in adults are rare (6) and mostly accompanied by fever or encephalitis, which was not observed in this patient.

The identification of variant IAVs emphasizes the zoonotic potential of these strains and highlights the importance of continued monitoring of both human and swine IAVs. The reported case suggests a need for focusing on early registration of swine exposure for humans with influenza-like illness, as well as increased measures to reduce the swine IAV exposure risk for people with occupational contact with swine.

Acknowledgments
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References

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Autochthonous Angiostrongylus cantonensis Lungworms in Urban Rats, Valencia, Spain, 2021

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