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Cowpox infection of the nose

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Abstract
A case of cowpox infection presenting as a necrotising cellulitis of the nasal tip and vestibule is reported. Diagnosis was established by identification of the pox virus particles from tissue culture of the nasal biopsy using electronic microscopy and the characteristic lesions on chorio-allantoic membrane produced by the virus. Cowpox of the external nose and transmission of the infection from a dog have not to our knowledge been reported previously.

Key words: Cowpox; Dogs; Nose

Case report

A 41-year-old female developed an inflammatory lesion of the nasal tip with vesicle formation following a scratch from her dog to the nose. She presented three weeks later with a necrotising cellulitis of the nasal vestibule and nasal tip (Figure 1). This was accompanied by marked bilateral upper cervical lymphadenitis and a pyrexia of 38°C. Her white cell count was normal but the ESR remained raised between 40 and 60 mm per hour from the time of admission. Serum anti-streptococcal titre and viral screen (not including cowpox) and toxoplasma IgM antibodies showed no abnormality.

Although nasal swab grew *Staphylococcus epidermidis* and *Enterococcus faecalis* on one occasion, bacterial culture of biopsies taken from the nasal lesion did not produce any growth. Histology showed non-specific inflammation but no pus cells were evident. Another sample was cultured for viruses in tissue culture. This produced a cytopathic effect after 10 days indicating the growth of a virus. When examined under an electron microscope, cowpox virus particles were detected in the culture filtrate (Figure 2). Inoculation of the culture filtrate into chorio-allantoic membrane of fertile hens' eggs demonstrated the characteristic lesions seen with cowpox (Figure 3). This diagnosis was made four weeks after presentation.

Initially intravenous cefuroxime and metronidazole were given. This was replaced by ciprofloxacin and acyclovir four days later since no resolution of the cellulitis was apparent. After the diagnosis was made, the anti-microbial agents were discontinued and the patient was reviewed on an outpatient basis. The nasal lesion remained for two months, but it gradually improved over a further two months. Apart from some general malaise, she has almost completely recovered six months after the onset of her illness with no specific treatment. The appearance of her nose has essentially returned to normal apart from minor scarring.

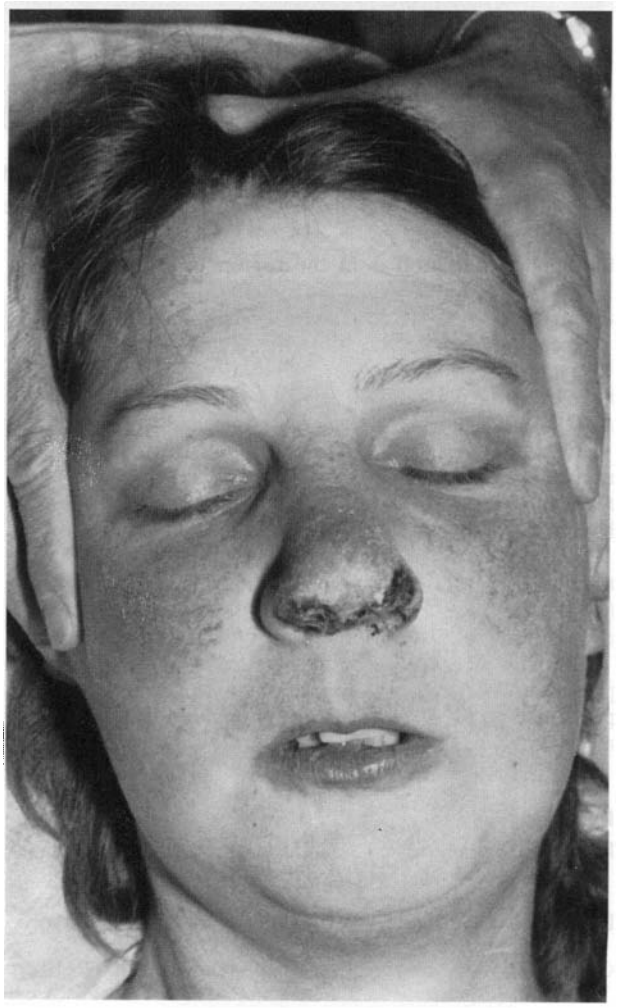

Fig. 1
Narcotising eschars on the nasal tip and vestibule.

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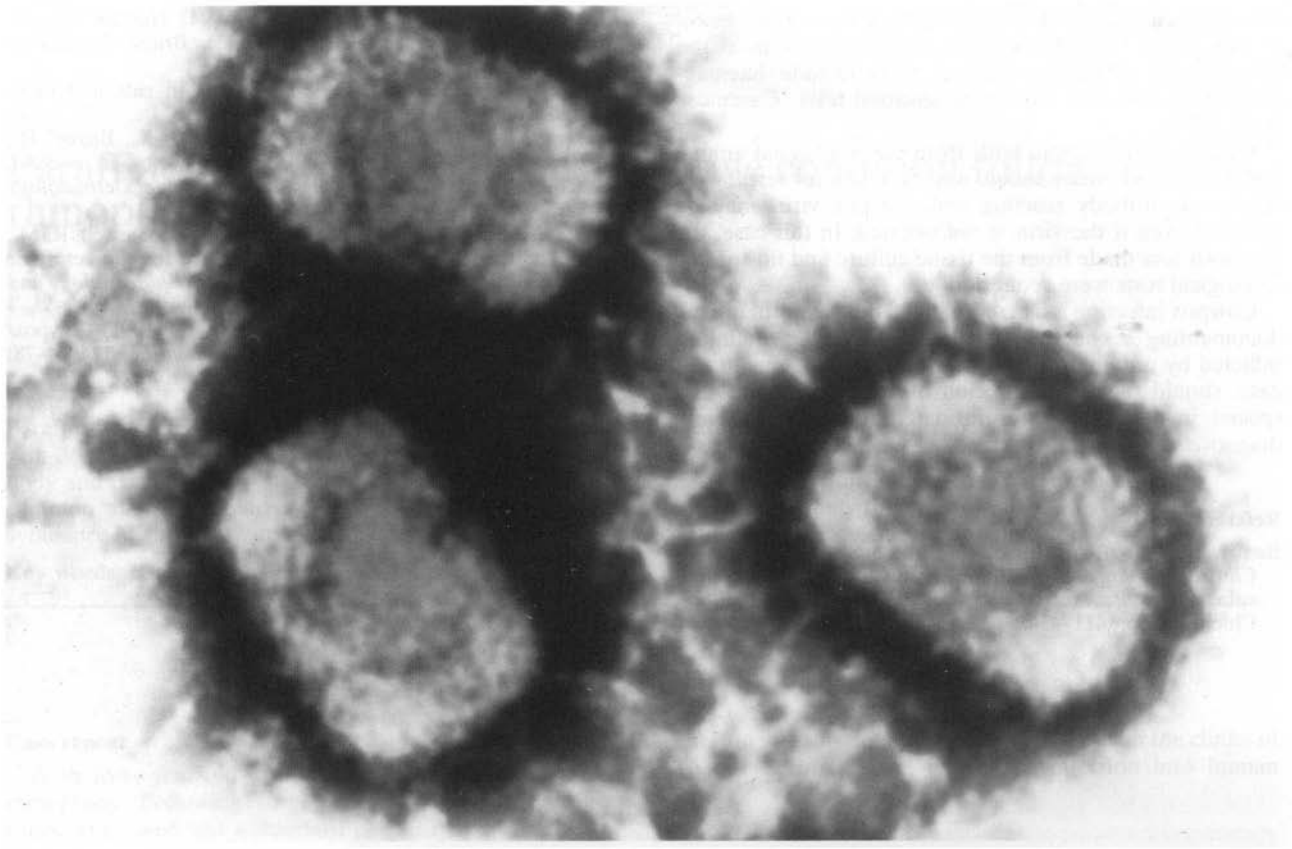

FIG. 2
Cowpox virus particles seen on electron microscopy.

Discussion

Cowpox virus infections in man have been reported since 1985. The primary infection is usually acquired from an infected domestic cat often by inoculation into a superficial wound. The case in this report was due to inoculation by a dog and this is the first known case arising from this particular animal. The illness arising from the infection may be prolonged but usually self-limiting, unless the patient is immunosuppressed (Bennett and Baxby, 1995). The management is usually supportive and specific therapy is not available. Acyclovir is ineffective but idoxuridine used in parapoxvirus infections may be helpful (Baxby *et al.*, 1994) although there is no documented use in cowpox infection itself. Based on the experience with cats and cowpox, corticosteroid treatment should not be used because it may aggravate the disease (Baxby, 1990).

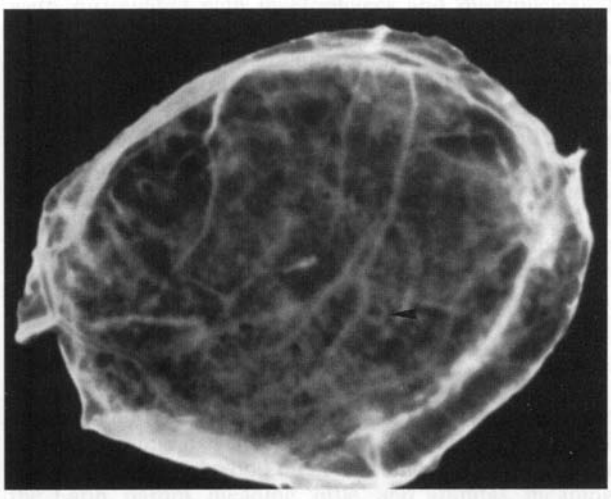

FIG. 3
Cowpox virus growing on chick chorio-allantoic membrane producing characteristic pocks (one indicated by an arrowhead).

The true incidence of human cowpox virus infection is unknown. Cowpox can be wrongly diagnosed clinically as other skin lesions such as orf or Milkers' nodes (Vestey *et al.*, 1991), parapox (infections from cows), herpes, eczema herpeticum, Kaposi's varicelliform eruption and anthrax (Baxby *et al.*, 1994). It has recently been suggested that bank and field voles and wood mice, rather than cattle, are the main reservoir hosts of cowpox virus in Great Britain (Crouch *et al.*, 1995). Domestic cats may be more susceptible to cowpox infection and probably have close contact with the cowpox hosts in the wild.

The presentation of the disease is that of a painful, haemorrhagic nodular lesion or black eschars, usually on the hand or face, accompanied by oedema, erythema, marked lymphadenopathy, and systemic involvement. Generalised cowpox is extremely rare. Diagnosis is made by direct examination of material from the lesions (vesicle fluid, scab extract or biopsy) stained with three per cent phosphotungstic acid and examined by transmission electron microscope. Pox virus particles are usually seen by this direct examination. In this case, the diagnosis was not suspected initially and the virus particles were seen on culture filtrate subsequently on electron microscopy. The material can also be inoculated into tissue culture which produces a cytopathic effect in 48 hours. It can be further confirmed by inoculation of the material from the lesion

into chick chorio-allantoic membrane. This was successful in this study, though electron microscopy is now the investigation of choice. Further tests include haemagglutination tests and virus neutralisation tests (Casemore *et al.*, 1987).

Ideally serum sample both from the implicated animal and its affected owner should also be taken for serological survey as antibody reacting with cowpox virus may be detected even if the virus is not isolated. In this case, the diagnosis was made from the tissue culture and no specific serological tests were requested.

Cowpox infection is a rare problem, but a careful history documenting a characteristic lesion following an injury inflicted by a domestic cat, and rarely by a dog as in this case, should raise the suspicion of the clinicians so that special investigations are instigated to make an early diagnosis.

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