NOTE

Posterior Paralysis in Pigs due to *Haemophilus pleuropneumoniae* Infection

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Many reports [3-9] have been published pleuropneumonia, arthritis, pericarditis and meningitis caused by *Haemophilus* species in swine. These diseases show such clinical signs as fever, cough and retardation in growth. No report, however, has dealt with posterior paralysis caused by pleural abscesses protruding into the vertebral canal of the thoracic vertebrae. The present communication seems to be the first to deal with cases of posterior paralysis induced by *Haemophilus pleuropneumoniae* infection.

In early winter of 1980, two pigs (3 and 4 months old) showed dog-like sitting position, anorexia, emaciation and cough. These clinical signs continued until they were sacrificed for autopsy one week later.

Autopsy findings were essentially the same in the two pigs. There were abscesses of pigeon-egg size on the pleura. The first pig had abscesses on the pleura on both sides of the 10th thoracic vertebral body (Fig. 1), and the second on the pleura on both sides of the 11th thoracic vertebral body. These abscesses on both sides extended from the pleura to the epiphyseal area and bone marrow of the thoracic vertebrae, and fused with one

another. Moreover, they protruded into the vertebral canal, and compressed the thoracic spinal cord (Fig. 2). There were hemorrhages on the cut surface of the compressed area of the thoracic spinal cord. The deformation of these thoracic vertebrae was caused by purulent inflammation of the epiphyseal cartilage area. Fibrino-purulent pleuropneumonia was noticed. Multiple abscesses of sizes ranging from soybean to broad bean were seen in the lung. Some parts of the lung adhered to the parietal pleura. The mediastinal lymph nodes were enlarged. No other lesions were found.

Histopathologically, inflammatory cells and proliferative connective tissue were observed around the necrotic areas of pleural abscesses. The abscesses extended into the epiphyseal cartilage and the bone marrow of the thoracic vertebrae (Fig. 3), causing purulent osteomyelitis with degeneration and necrosis of the epiphyseal cartilage. In lesions near the epiphyseal cartilage, there were dissolution and osteoclastic absorption of trabecular bones. In addition, the abscesses protruded into the canalis vertebralis, inflicting pressure upon the spinal cord. Degeneration and necrosis of nerve cells

and fibers, and hemorrhages and proliferation of microglia cells were found in the constricted area of the thoracic part of the spinal cord (Fig. 4). There was fibrino-purulent pneumonia with scattered necrotic lesions in the lung. Sinus catarrh was caused in the mediastinal lymph nodes.

Bacterial examination was carried out with 5% sheep blood trypto-soy agar plates. Samples were collected from the lung, mediastinal lymph nodes, pleural abscesses, heart, liver, spleen, kidney, brain, thoracic part of the spinal cord and hock joints of the two pigs. Non-hemolytic staphylococci formed colonies on these plates. The culture was incubated at 37°C aerobically and by the candle jar method and the steel wool methods. In 24–48 hr of incubation, *Haemophilus pleuropneumoniae* was isolated from the lung and the pleural abscesses by the aerobic and the candle jar methods.

Mycoplasma cultivation was attempted from the pleural and pulmonary abscesses with Hayflick's and modified Goodwin's media. The inoculated media were incubated at 37°C for 5 days, from which passages were made twice. No *Mycoplasma* was isolated from them by direct culture or subculture.

Virus cultivation was tried from the pleural and pulmonary abscesses on bovine embryo kidney primary monolayer culture (BEK). Inoculated BEK medium was incubated at 37°C for 5 days, from which passages were made five times. No viruses were isolated from them.

Finley [1] examined pigs showing posterior paralysis and found that the symptom had been caused by damage of the spinal cord induced by vertebral abscesses, from which isolated were *Streptococcus* sp., *Staphylococcus* sp., *Pseudomonas* sp., *Escherichia coli*, *Corynebacterium pyogenes* and *Pasteurella haemolytica*. Hiramune *et al.* [2] observed posterior paralysis in pigs with abscesses in the lumbar vertebrae and isolated *Corynebacterium pyogenes* from these abscesses.

It was considered that posterior paralysis in the present cases had been caused by degenerative and necrotic changes of the thoracic part of the spinal cord induced by pressure of abscesses extending from the pleura into the canalis vertebralis through the epiphyseal cartilage. The pleural abscesses might have been produced by *H. pleuropneumoniae* causing pleuropneumonia, because this organism was isolated from the lung.

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EXPLANATION OF FIGURES

Fig. 1. Pleural abscesses (arrows) on both sides of the thoracic vertebral body. Three months old.

Fig. 2. Pleural abscesses extending into the canalis vertebralis through epiphyseal cartilage and causing constriction (arrow) in the thoracic part of the spinal cord. Three months old.

Fig. 3. The pleural abscess extends into the cana-

lis vertebralis through epiphyseal cartilage of thoracic vertebrae. Three months old. HE staining. $\times 13$.

Fig. 4. Hemorrhages in the area of the thoracic part of the spinal cord constricted by the abscess. Three months old. HE staining. $\times 100$.

要 約

Haemophilus pleuropneumoniae による豚の後躯麻痺(短報): 界外 昇・杉山 明・山中進吾・佐々木 理¹⁾・杉山公宏²⁾・磯田政恵²⁾(北勢家畜保健衛生所, 中勢家畜保健衛生所¹⁾, 日本獣医畜産大学病理学教室²⁾)——後躯麻痺を主症状とする豚2頭を剖検したところ, 胸膜肺炎と胸椎両側の胸壁胸膜に1対の膿瘍がみられた。この膿瘍は, 脊柱管に達して脊髄を圧迫していた。肺および膿瘍から *Haemophilus pleuropneumoniae* が分離された。*H. pleuropneumoniae* による膿瘍によって脊髄が圧迫されたために起こった後躯麻痺症例の報告は, 本例が最初であろう。