Benign proliferation of blood vessels has been reported in the lungs and lymph nodes of Atlantic bottlenose dolphins (Tursiops truncatus) stranded along the Texas Gulf Coast, and that lesion has been designated as angiomatosis [9]. The cause of angiomatosis has not been clarified, and a broad field defect of vascular endothelium has been speculated [9]. On the other hand, nematode infection of the bronchial tract was commonly found in harbor porpoises stranded in United Kingdom, Belgium and Germany [2, 6, 8, 10]. In the bottlenose dolphin, 2 species of lungworms have been reported: Halocercus lagenorhynchus [3, 4] and Stenurus ovatus [1, 5]. The latter has recently been reported from the lungs of a bottlenose dolphin, originally captured in the Pacific Ocean of Taiji, Wakayama and housed in the Katsurahama Aquarium in Japan [7]. Here we describe histopathological findings of the proliferation of pulmonary blood vessels and Stenurus infection in a bottlenose dolphin captured in Taiji, and discuss a possible pathogenesis.

A female bottlenose dolphin was captured in Taiji of Wakayama Prefecture, and kept in the breeding pool. The dolphin suddenly died at 17 days after the capture and a complete necropsy was conducted. The body length was 262 cm, and the dolphin was markedly emaciated. Macroscopically, severe pulmonary congestive edema was found. Histopathology revealed many lungworms in the bronchioli and the worms were identified as Stenurus ovatus. Various sized vessels proliferated around the lesioned bronchioli. Based on these findings, chronic bronchopneumonia due to the lungworm was diagnosed and vascular proliferation was similar to angiomatosis recently reported in Atlantic bottlenose dolphin.

NOTE Pathology

Pulmonary Vascular Proliferation and Lungworm (Stenurus ovatus) in a Bottlenose Dolphin (Tursiops truncatus)

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ABSTRACT. A female adult bottlenose dolphin suddenly died at 17 days after the capture. Macroscopically, severe pulmonary congestive edema was found. Histopathology revealed many lungworms in the bronchioli and the worms were identified as Stenurus ovatus. Various sized vessels proliferated around the lesioned bronchioli. Based on these findings, chronic bronchopneumonia due to the lungworm was diagnosed and vascular proliferation was similar to angiomatosis recently reported in Atlantic bottlenose dolphin.

KEY WORDS: angiomatosis, lungworms, vascular proliferation.
Based on histopathological findings, a diagnosis of chronic bronchopneumonia due to lungworm infection was made. Infection with lungworm has been commonly found in the European countries and cause subacute to chronic bronchitis and bronchiolitis [2, 6, 8, 10]. Parasitologically, *Stenurus ovatus* was found in the esophagus and stomach of the bottlenose dolphin. These worms also parasitize in the bronchi and blood vessels [1, 7]. This case indicates that *Stenurus ovatus* infection was also distributed along the Japanese coast.

This is the first case report of vascular proliferation in the lung of bottlenose dolphin captured in Japan. Angiomatosis was recorded in 25 of 54 (46.3%) bottlenose dolphin stranded along the Texas Gulf coast during 1991–1996 [9]. Most cases with angiomatosis were sexually mature dolphin. Fifteen dolphins out of 25 angiomatosis cases had lungworms. In addition, the dolphins with angiomatosis...
VASCULAR PROLIFERATION AND LUNGWORM IN DOLPHIN

also had other lung conditions, such as amyloidosis, acute bacterial pneumonia, and emphysema [9]. Angiomatosis consistently occurs symmetric bilateral over visceral pleura. Thus, Turnbull et al. [9] discussed that lung condition found in angiomatosis cases were coincidental.

Vascular proliferation found in the present case was closely located with verminous bronchopneumonia. Prominent proliferation of vessels was also found in the submucosa of lesioned bronchioles. Thus, vascular lesion in the present case, partly at least, was considered to be associated with inflammatory lesion. Vascular proliferation seen in the lymph node was similar to that in the lymph node lesion reported in angiomatosis cases [9]. Therefore bottlenose dolphin may have a predisposition for the vascular proliferation when some insults happen in the lung and lymph node.

REFERENCES


Fig. 6. Many endothelial cells were positively stained with von Willebrand factor. Immunohistochemistry against von Willebrand factor. Bar=100 µm.

Fig. 7. Vascular walls in the proliferated vessels contain α-smooth actin positive smooth muscles. Immunohistochemistry against α-smooth muscle actin. Bar=100 µm.

Fig. 8. Vascular proliferation in the pulmonary hilar lymph node. HE. Bar=100 µm.