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Aneurysma aortae congenitale in two seals

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Summary

Two young seals, one a harbour seal (*Phoca vitulina*) and one a grey seal (*Halichoerus grypus*) died suddenly without showing any signs of illness before death. At autopsy an aortic aneurism was found in both animals. A description of the histology is given.

Introduction

In the Seal Rehabilitation and Research Centre at Pieterburen (The Netherlands), sick or exhausted seals are taken in and cared for. After recovery, the animals are returned to the Waddensea. Autopsy is carried out on dead animals. Over a period of two months, an aneurism was found at the arcus aortae in two young seals. In the literature no reference was found to this condition, but a personal communication was received from Dr J. R. Baker.

Case number one

On 11 August 1987, a harbour seal (*Phoca vitulina*) was found at Terneuzen in the province of Zeeland. It was transported the same day to Pieterburen, a distance of about 200 miles.

The animal, a female, was in poor condition, exhausted and emaciated. The age was estimated to be about two weeks and the weight was 9300 gm. She had probably lost her mother. Before the day she was found, the weather was bad with rain showers and strong winds.

The treatment started with the administration of oral rehydration salts†, 200 ml being given five times a day. After a few days, this quantity was given twice daily together with 400 gm of mashed fish, administered by stomach tube.

Daily antibiotics were injected intramuscularly. The body temperature varied from 36.8°C to 38.2°C.

On 27 August a stiffness of the neck was noted. This lasted until the middle of September.

†Oral rehydration salts contained in each 100 ml: Glucose 3.64 gm; KCl 0.10 gm; NaCl 0.10 gm; Na lactate 0.40 gm.

On 18 September, the body temperature was 39.7°C. 2 ml of 'Vancocin'‡, 1.5 ml of 'Colistin'§ and one tablet of 'Finimal'‖ were administered twice daily. The temperature fell and stayed between 37°C and 38°C. X-ray pictures and a blood sample were taken but an accurate diagnosis was not reached. The

Figure 1. Thoracic haemorrhage—case number two.

‡'Vancocin', Vancomycin hydrochloride, 50 mg/ml, by Eli/Lilly, Amsterdam, The Netherlands.
§'Colistin', Colimycin sodium methylsulphonate, 80 mg/3 ml i.m., by Rhonel Poulenc Nederland B.V., Draaistroom 1, 1181 VT Amstelveen, The Netherlands.
‖'Finimal', manufactured by Nutricia B.V., Postbus 1, 2700 MA Zoetermeer, The Netherlands.

Figure 2. Heart with arcus aortae demonstrating the site of the aneurism (see arrow).

Figure 3. Aorta opened to show the aneurism with blood clots.

animal however was developing rather well. The weight reached 30 kg on 11 November but the seal still had to be hand fed and the neck stiffness remained. On 26 November she suddenly died. No abnormality was seen immediately prior to her death.

The same day an autopsy was carried out at the Animal Health Service Centre, 'Noord-Nederland', at Drachten. The carcase was in good order, the blubber layer measuring 4 cm. In the thorax was a large quantity of clotted blood, the mediastinum being ruptured. The aorta demonstrated an aneurism, 10 cm from the left ventricle and just opposite the ductus arteriosus. The aortic aneurism was ruptured for a length of 14 mm.

The atlanto-occipital joint showed signs of a chronic inflammation. Bacteriological examination proved to be negative. Histological examination of the aneurism was carried out and is described below.

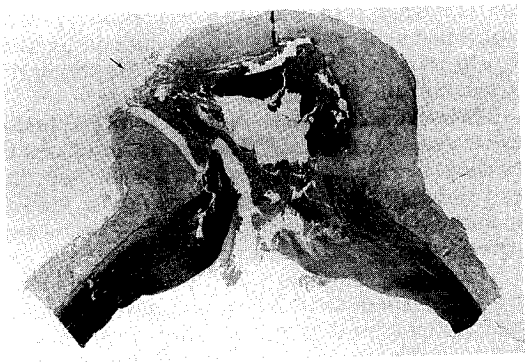

Figure 4. Aneurism with perforation (see arrow). Verhoef stain 10 ×. (The media has a black appearance caused by the silver stain of the elastic fibres.)

Case number two

On 4 December 1987, a grey seal (*Halichoerus grypus*) was found on Terschelling, an island in the Waddensea. The same day it was transported to Pieterburen. It was a male, in poor condition, aged about four weeks and weighing 16.5 kg.

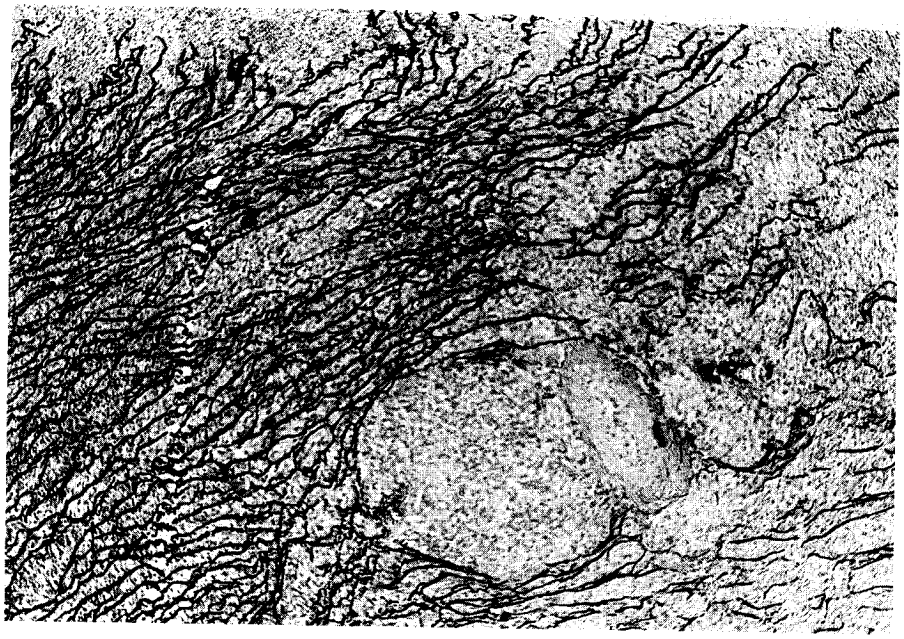

Figure 5. The elastic fibres are ruptured and destroyed at the border of the aneurism. In the centre is a low perivascular infiltrate not stained by this method. Verhoef stain 100 ×.

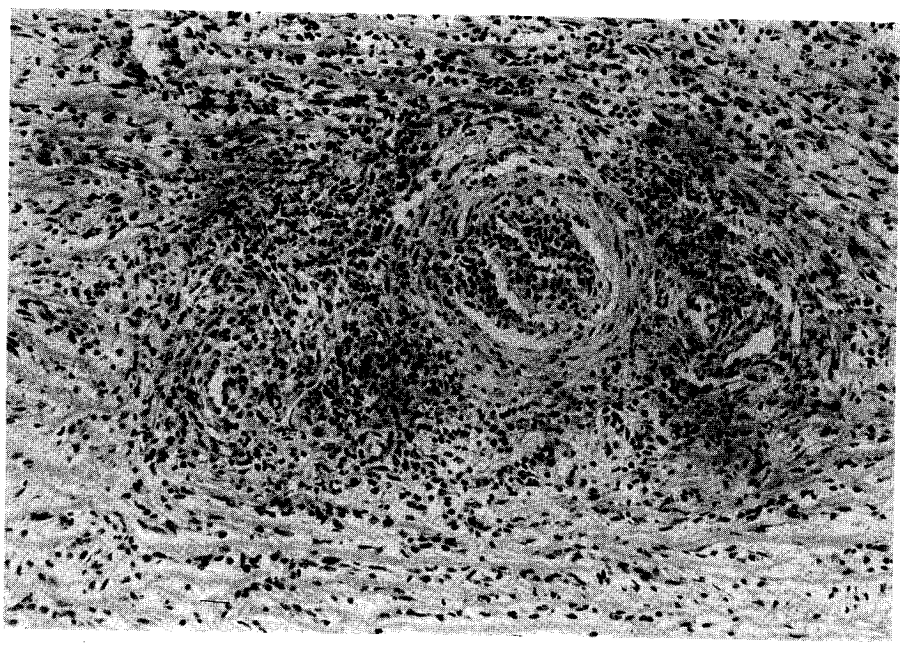

Figure 6. Media of the aortae with perivascular and diffuse infiltration, predominantly of lymphocytes and neutrophils (H.E. stain 100 ×).

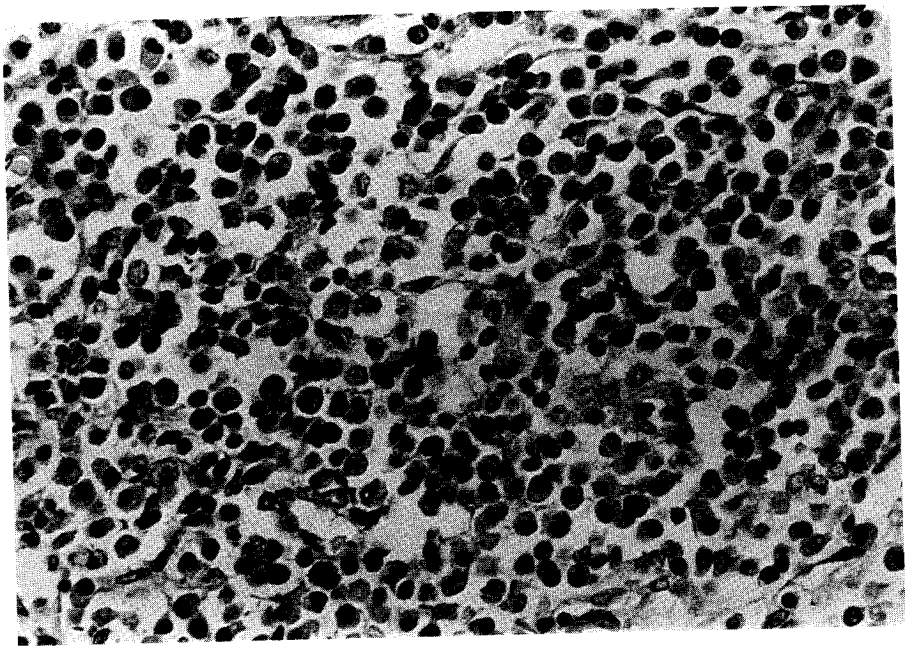

Figure 7. Plasmacytic infiltration in the adventitia and in the immediate perivascular fibrotic tissue (H.E. stain 250 ×).

The body temperature was 39.2°C, but it soon fell to 37.3°C after 36 hours following antibiotic treatment with 5 ml 'Vancocin' and 0.5 ml 'Netilmycin'¶ twice daily. Treatment continued for eight days and during this period the temperature fluctuated around 37°C.

From the beginning, oral rehydration salts and mashed fish were administered. Two weeks after admission into the Centre the animal was taking fish himself.

Everything progressed well and release into the Waddensea was planned to take place at the end of January 1988. However, on 19th of that month the animal was found dead in the pool although during the morning's feed it was still lively.

As in the previous case, autopsy was carried out the same day. The carcase was in good order, the blubber layer measured 4 cm, the body weight was 49 kg. On opening the thorax, the pericardial cavity could be seen filled with clotted blood (Fig. 1). This was the result of a ruptured aneurysma aortae just inside the pericardium (Figs 2 and 3). All the other organs appeared normal.

¶'Netilmycin', Netromycin Sulphate, 100 mg/ml i.m., by Essex B.V., Postbus 70, 1180 AB Amstelveen, The Netherlands.

Histological examination

The hearts of both the animals were well developed and did not show any congenital defects. Both on macroscopic and microscopic examination the musculature had a regular structure without signs of infection. The membraneous valves closed well without verrucae or myxoid changes. The localization of the aorta was normal. Both aortae demonstrated saccular aneurisms surrounded by thick fibrous tissue. Rupture of the aneurism had caused extensive bleeding. On microscopical examination of the aneurisms, degeneration of the elastica was seen (Fig. 4). Oedema, necrosis and neutrophilic infiltration was seen in the media, causing the rupture of the aneurism (Fig. 5). The vasa vasorum were surrounded by a dense infiltration of neutrophils and lymphocytes, with some plasma cells, especially at the junction of the media and the adventitia (Fig. 6).

These perivascular infiltrations contained neutrophils, especially close to the necrotic areas, but at some distance from the lesions more lymphocytes were located in the perivascular zone. In the aortic wall plasma cells were occasionally found. In the fibrous thickened adventitia, which surrounded the aneurisms, plasma cell infiltration is often aggregated (Fig. 7). To a lesser degree they diffused out into the connective tissue. Perivascular localization of plasma cells is only seen in a few places.

At the outside of the aortic lesions granulation tissue was found. Using Giemsa, Gram, Ziehl Neelsen, PAS, and crocot staining methods, no bacteria, spores or fungi were found. The Bosma Steiner stain for Spirochaetal structures was also used but with negative results. A localized process, as an explanation for an infection, without any signs of this infection elsewhere in the body of the seal, is not acceptable.

Conclusion

In both these young seals a circumscribed aneurism was found in a part of the aortic wall in which congenital deviations regularly occur in both man and other mammals. In our opinion these lesions are aneurysma aortae congenitale.