



## SPONTANEOUSLY ARISING DISEASE

# Unexpected Cardiac Death During Anaesthesia of a Young Rabbit Associated with Fibro-fatty Replacement of the Right Ventricular Myocardium

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## Summary

A 6-month-old female pet rabbit was presented for routine ovariectomy. The pre-anaesthetic evaluation was unremarkable and no anaesthetic complications occurred during the procedure. However, at the end of the surgery, the rabbit suddenly showed acute bradycardia and cardiac death. Necropsy examination revealed marked dilation of the right ventricle, associated with diffuse thinning of the right ventricular free wall. Gross and histopathological findings were suggestive of a congenital dilated cardiomyopathy characterized by fibro-fatty replacement of the right ventricular myocardium. Similar myocardial lesions have not been previously described in rabbits, although they have been documented in myocardial diseases of man, dogs, cats, cattle, horses and chimpanzees.

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Cardiac disease is recognized increasingly in domestic rabbits and cardiomyopathy is a common post-mortem finding in older rabbits (Huston, 2004). Congenital heart disease in rabbits is reported rarely and little is known about the pathogenesis of naturally occurring heart disease in rabbits, since reports of spontaneously arising heart disease are usually sporadic (Huston, 2004).

The present case describes a 6-month-old female pet rabbit, 1.15 kg in body weight that was presented for routine ovariectomy. The animal had been vaccinated against myxomatosis and rabbit viral haemorrhagic disease and no previous signs of illness were reported. On physical examination, the rabbit was bright, alert and well hydrated. The mucous membranes were pink with normal capillary refill time.

Findings on oral examination, thoracic auscultation and abdominal palpation were within normal limits. The anaesthetic protocol included sedation and analgesia by subcutaneous administration of medetomidine (0.1 mg/kg), butorphanol (0.2 mg/kg) and ketamine (10 mg/kg), before isoflurane mask induction of anaesthesia. The patient was then intubated and maintained on isoflurane gas. No anaesthetic complications occurred during the procedure. However, at the end of surgery the rabbit suddenly developed acute bradycardia and died. The owner gave consent for necropsy examination, which revealed severe dilation of the right ventricular chamber (Fig. 1) associated with diffuse thinning (<1 mm) of the right ventricular free wall. An intense and diffuse, acute visceral congestion was also observed.

Samples of the heart and representative tissues of all major organs were fixed in 10% neutral buffered

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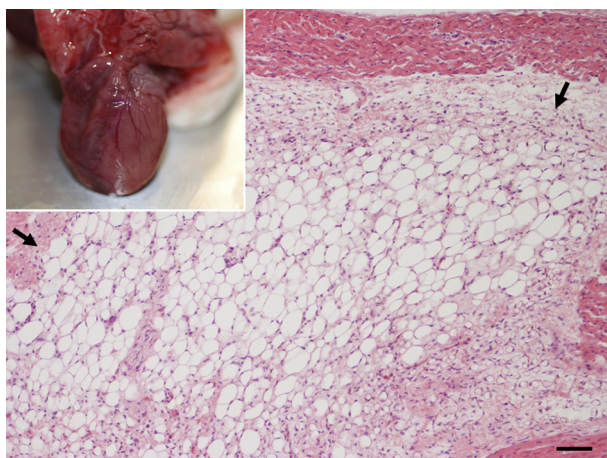


Fig. 1. Histopathology of the right ventricular myocardium. Severe, transmural myocardial replacement by fibro-fatty tissue (arrows). Residual areas of unaffected myocardium are visible at the top and right side of the image. HE. Bar, 66  $\mu$ m. Inset: gross appearance of the heart showing severe right ventricular dilation.

formalin, processed routinely and embedded in paraffin wax. Sections were stained with haematoxylin and eosin (HE) and Masson's trichrome. Histopathological examination of the right ventricular free wall revealed segmental, moderate to severe, transmural myocardial replacement by fibro-fatty tissue, predominantly extending from the subepicardium to the endocardium (Figs. 1 and 2). The remaining myocardial tissue had multiple myocyte abnormalities including wavy cell elongation with dysmetric and dysmorphic nuclei, segmentation of hypercontracted myofibres, myocyte hyper eosinophilia and focal necrosis (Fig. 3). In addition,

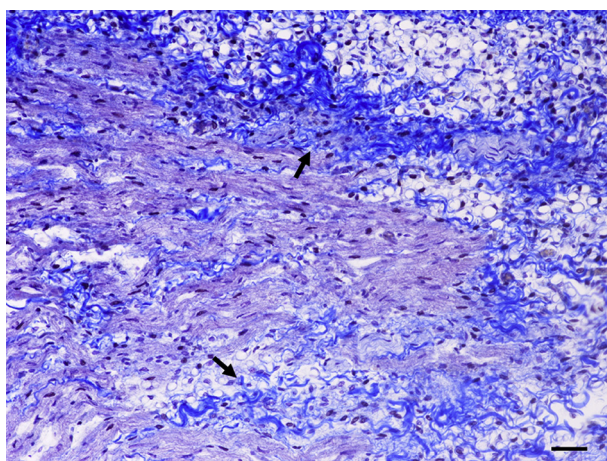


Fig. 2. Histopathology of the right ventricular myocardium. Severe myocardial replacement by fibro-fatty tissue (arrows), with admixed abnormal myocytes. Masson's trichrome. HE. Bar, 33  $\mu$ m.

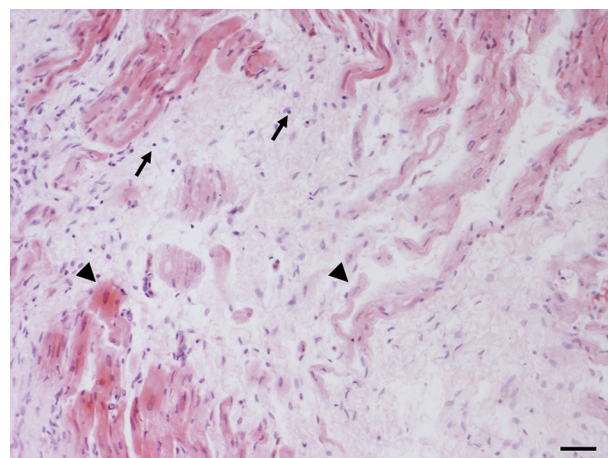


Fig. 3. Histopathology of the right ventricular myocardium. Higher magnification of myocyte abnormalities characterized by wavy cell elongation, myofibre segmentation and multifocal myocyte hyper eosinophilia (arrowheads). A few round inflammatory cells are also admixed with fibrous tissue (arrows). HE. Bar, 33  $\mu$ m.

tion, patchy, mild lymphocytic inflammatory infiltrates were admixed with the fibro-fatty tissue (Fig. 4). Multifocal areas of replacement-type fibrosis were also observed at the right side of the interventricular septum. The left ventricular free wall and the left side of the interventricular septum were not affected. The histopathological examination revealed no significant microscopical lesions in the other organs examined.

These findings, associated with the very young age of the rabbit, suggested a diagnosis of congenital dilated cardiomyopathy characterized by fibro-fatty replacement of the right ventricular myocardium.

Similar lesions have been reported in different myocardial diseases of man and animals. In this

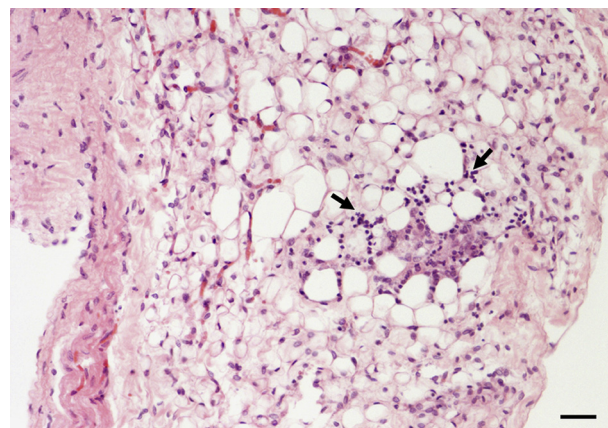


Fig. 4. Histopathology of the right ventricular myocardium. Patchy, mild lymphocytic inflammatory infiltrates (arrows) admixed with the fibro-fatty tissue. HE. Bar, 33  $\mu$ m.

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