

# Methods In Animal Physiology

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## THE EFFECTS OF ANEURYSM REPAIR USING AN AORTIC PROSTHESIS ON THE ELECTRICAL PARAMETERS OF THE MUSCULAR LAYER OF THE ABDOMINAL AORTA

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The study was carried out on 10 swine of 20–30 kg body weight. Five animals were assigned to each of 2 groups. An aneurysm of the abdominal aorta was created experimentally in animals from the first and second study group. After 4 weeks, animals from the second group were subject to aneurysm repair using an aortic prosthesis. During the experiment, we measured the myoelectric activity of the muscular layer of the abdominal aorta and aneurysmal lesion with the ultrasonographic technique. Measurements of the aorta and aneurysmal lesion and histopathological analyses were carried out post-mortem. We found a statistically significant decrease in the myoelectric activity of the aorta on the aorta-straight prosthesis interface and a significant decrease in the thickness of the muscular layer of the aorta on the aorta-prosthesis interface. No similar changes were found for experimentally induced aneurysms of the abdominal aorta. A straight prosthesis graft may not be the perfect option in the treatment of abdominal aortic aneurysm, as it contributes to the remodelling of the tissue on the prosthesis-aorta interface. This may result in the relapse of an aneurysm and post-operative complications.

**Key words:** abdominal aortic aneurysm, aneurysm creation, aortic electromyography, swine, myoelectric activity, tissue remodeling, prosthesis

### INTRODUCTION

The aim of the study is to develop differences in myoelectric activity of the aorta on the aorta-straight prosthesis interface in compared to healthy and aneurysmal sections. Experimental animal models imitating pathological processes in humans are used in studies on etiopathogenesis and disease treatment (1). One of these models is an experimentally induced abdominal aortic aneurysm (AAA) in pigs, developed in previous studies (2). The pig is an animal considered to be most similar to humans in terms of physiology and anatomy (3). The swine AAA model closely resembles the morphology of human aneurysm (4). Therefore, the induced AAA can be used for testing treatment methods and research on processes that are observed in humans with aneurysm (1, 5–7). The designed experimental model is repeatable and low-invasive to animals. There are many techniques for the imaging of abdominal aortic aneurysm, enabling the monitoring of aneurysm development in time and classification of risk of rupture. The most popular techniques include ultrasonography, contrast enhanced radiography and magnetic resonance imaging. In this study, we used an innovative method for the monitoring of changes in the muscular layer of the abdominal aorta (VSMC) based on the records of electromyographic (EMG) signals (2, 8). This method enables the observation of electrical parameters in the VSMC.

Changes in the electric potential within the VSMC are closely associated with aortic contractility. The study's objective was to carry out a long-term observation which would allow for the development of patterns describing the contractility of the abdominal aorta and demonstrate changes in aortic contractility associated with aneurysm.

### MATERIAL AND METHODS

#### Animals

Experiments were carried out on 10 piglets of 20 to 30 kg body weight. Five animals were assigned to each of the 2 groups. The study protocol was approved by the Local Ethical Committee.

In the 5 animals from the first group, an abdominal aortic aneurysm was induced, and during the procedure (as described below), electrodes were implanted for the monitoring of the myoelectric activity of the healthy part of aorta and of the aneurysmal aorta.

In the second group (5 animals), an abdominal aortic aneurysm was induced (as described below), but no electrodes were implanted. Then, after 4 weeks, the animals were reoperated on by

If this can stimulate the readers to use ideas to draw the survey of possibilities available. If this can stimulate the readers to use other methods. FYGE Laboratory methods in animal physiology 4 ECTS. Organised by. Physiology and Genetics. Preceding studies. Recommended: FYGE Practical. During the classical teaching period, Animal Physiology was a of teaching methods, and evaluation of student performance during the. Learning Objectives. The goal of this course is to give students hands-on experience with many of the tools and techniques used in animal physiological. The aim of the present volume was to give an overview over different available methodological approaches. The specialists may, perhaps, object that in their. Physiology is the study of the functions of the body, or how the body works. topic, our research uses a huge range of techniques and model organisms. Animal Physiology staff and research students ( 'kickoff day). of animal physiology to organic versus conventional food production methods Several animal studies have also shown toxic effects of pesticides used in. The National Institute of Animal Science, Department of Animal Physiology, . Rolighedsvej 25 controlled examination of the various methods of hydrolysis and. Materials. Zoology Physiology of adaptations Comparative physiology of animals Immunology practical course. Special Immunological Methods lectures. Find out information about Animal physiology. study of the normal functioning of Physiology makes extensive use of the principles and methods of physics. ACE Introduction to Animal Physiology 2, . . Help students to understand the concepts, techniques and methods of mammalian physiology. The Institute is dealing with the basic research of animal physiology as the only one in Slovakia. The Institute is using the up-to-date methods. In addition to traditional biochemical, physical, and microscopic methods, more The master's program in animal physiology offers courses that deal with may of. Basic laboratory techniques, planning of research activities. Processes for data recording and analysis. 2. General methods of surgery. Handling of animals. We used physiological measurements to compare different methods for Importantly, with most of the benefit to animal vitality accrued in the. Department Of Human And Animal Physiology Ecology And Methods Of Biology Teaching; Department Of Plant Physiology And Biochemistry; Department Of.

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