

# IDENTIFICATION OF DORSAL CUTANEOUS PERFORATOR VESSELS USING ANGIO CT TECHNIQUE

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## Abstract

*The pig is used very often as an experimental model in plastic surgery. Identification of the correct skin flap require also identification of the cutaneous perforate vessel that irrigate the flap. The contrast medium used in radiology and CT have the capability to highlight the small vessel of the skin.*

**Key words:** pig, CT angiography, dorsal cutaneous perforator.

## Introduction

In order to ensure a reconstructive similitude as large as possible, but also to reduce the morbidity of the donor and recipient areas, as well as the surgical time for free flaps, surgeon preoccupation has been to develop and increase the applicability of local or regional flaps, based on cutaneous perforators.

Through this study, we aimed to improve the technique of detecting the main cutaneous perforator vascular branches in the dorsal region of the pig, via angio-CT.

## Material and methods

The biological material used in the research was represented by a group consisting of 5 PIC F II pigs (3 females and 2 males) with body mass ranging from 25 kg to 40 kg.

Choice of pig type: Given the morphological characteristics of pig breeds to achieve the proposed objectives, namely the detection of the main perforated vascular branches at the whole-body surface area of the pig, we chose the PIC-F 11-337 meat hybrid. We have chosen this type of hybrid because:

- the fat layer is small;
- has a good ability to adapt to the new environmental conditions encountered in the research environment;
- has increased resistance to diseases and pests.

For preoperative angiographic exploration, the pigs were sedated by intramuscular or intravenous (neurolept-analgesia) anesthesia with 0.1-0.2 ml/kg Narcoxyl 2 (20 mg / ml hydrochloric xylazine), 0.05 ml/kg Stresnil (azaperone 40 mg / ml) and 0.1 ml/kg Ketaminol 10 (100 mg / ml hydrochloric ketamine).

For angiography the contrast delivery was done using an automated CT 9000 ADV Contrast Delivery System, manufactured by Mallinckrodt. The device is designed to inject radio-opaque material into the vascular bed, making it easier for the doctor to diagnose a diagnosis. The contrast media was represented by Omnipaque 350 in dose of 2.5 ml/kg.

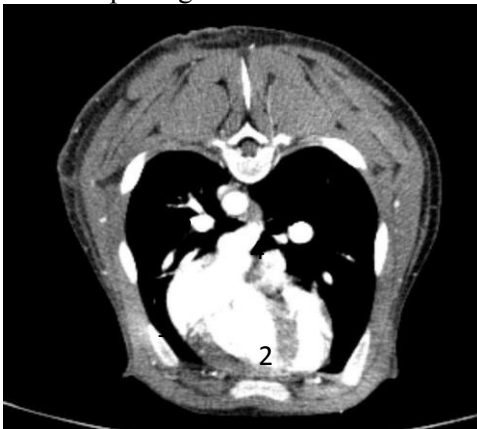


**Figure 1** Ct scanning

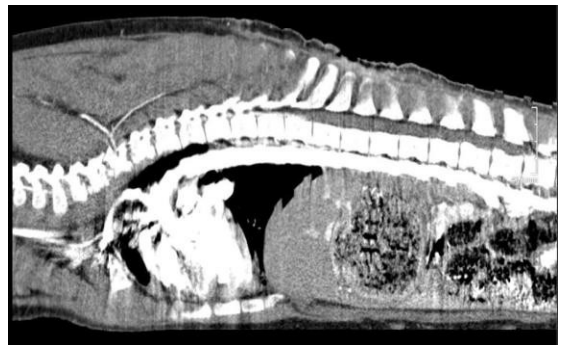
### **Results and discussion**

The scanning was performed using bolus tracking technique. On the imagines obtained on the premonitoring scan a marker was set on the aorta. The automatic scan was started when the HU values registered on the aorta was greater than 100.

The first scan highlights the heart and main arteries (fig. 2, fig 3) and the deep muscular artery without putting in evidence de vascularity of the skin.

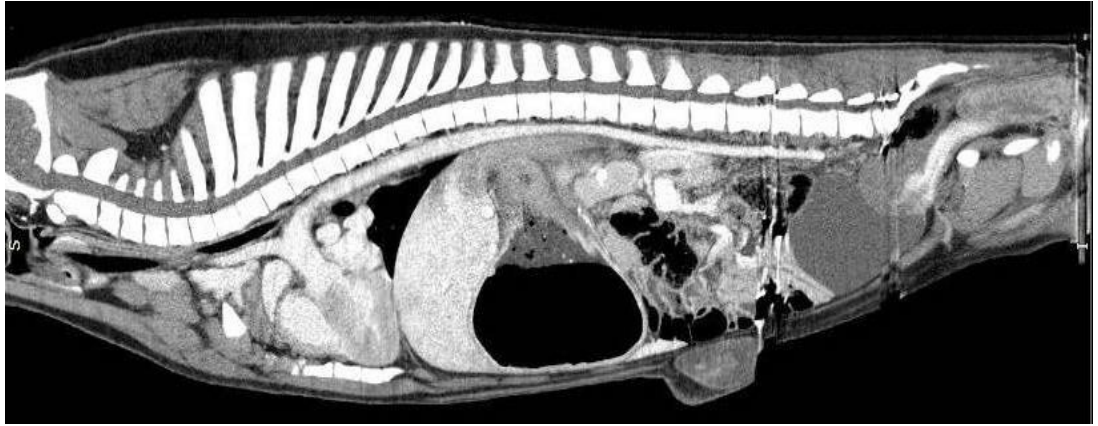


**Figure 2** Axial scan in the arterial time. 1 – Left ventricle; 2 – Right ventricle; 3 – Aorta; 4 – Vena Cava

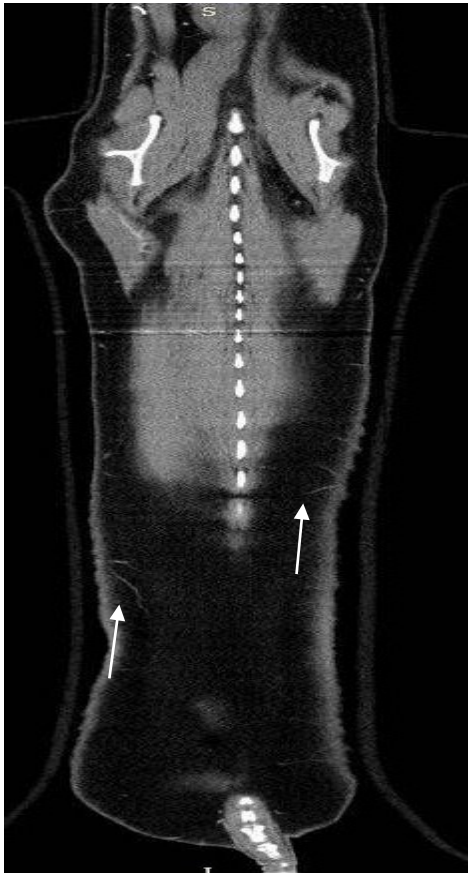


**Figure 3** Sagittal scan in the arterial time

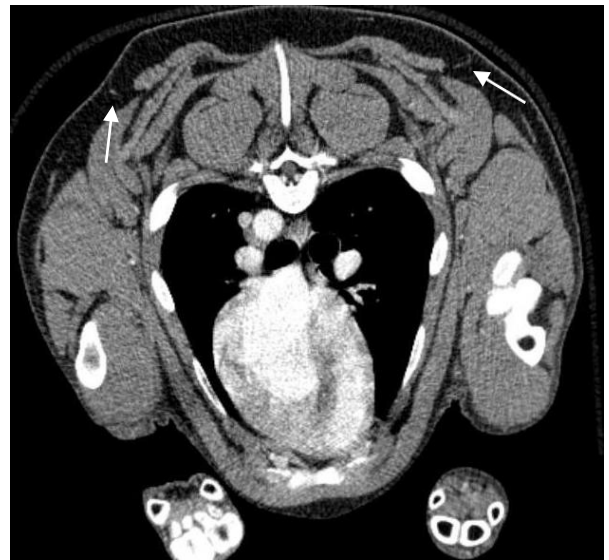
After 30 seconds from the first scan another scan was done in the venous time (fig. 4). The cutaneous perforants begins to be visible after 3 minutes after the bolus injection (fig. 5). The dorsal cutaneous perforants are more visible in dorsal MPR on the lateral side of the abdominal and thoracic area (fig 6).



**Figure 4.** Sagittal scan in the venous time.



**Figure 5** Presence of dorsal cutaneous perforators (white arrow)



**Figure 6** Thoracic cutaneous perforators (white arrow)

### **Discussion**

Properly identifying the supply vessel of the cutaneous flap help reduce the morbidity of the donor site (Kirki and Narayan, 2012; Lăcătuș et al, 2016). Using Angio-CT technique the

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surgeon is able to visualize the in real time the peripheral vascularization of the skin identifying the best area from where a skin flap can be prelevated. The most visible flap vascularization was evident in the dorsal-lateral abdominal area.

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**References**

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