

VASCULAR ACCES PORT PLACEMENT FOR SAPHENOUS VEIN CATHETERS IN GÖTTINGEN MINIPIGS

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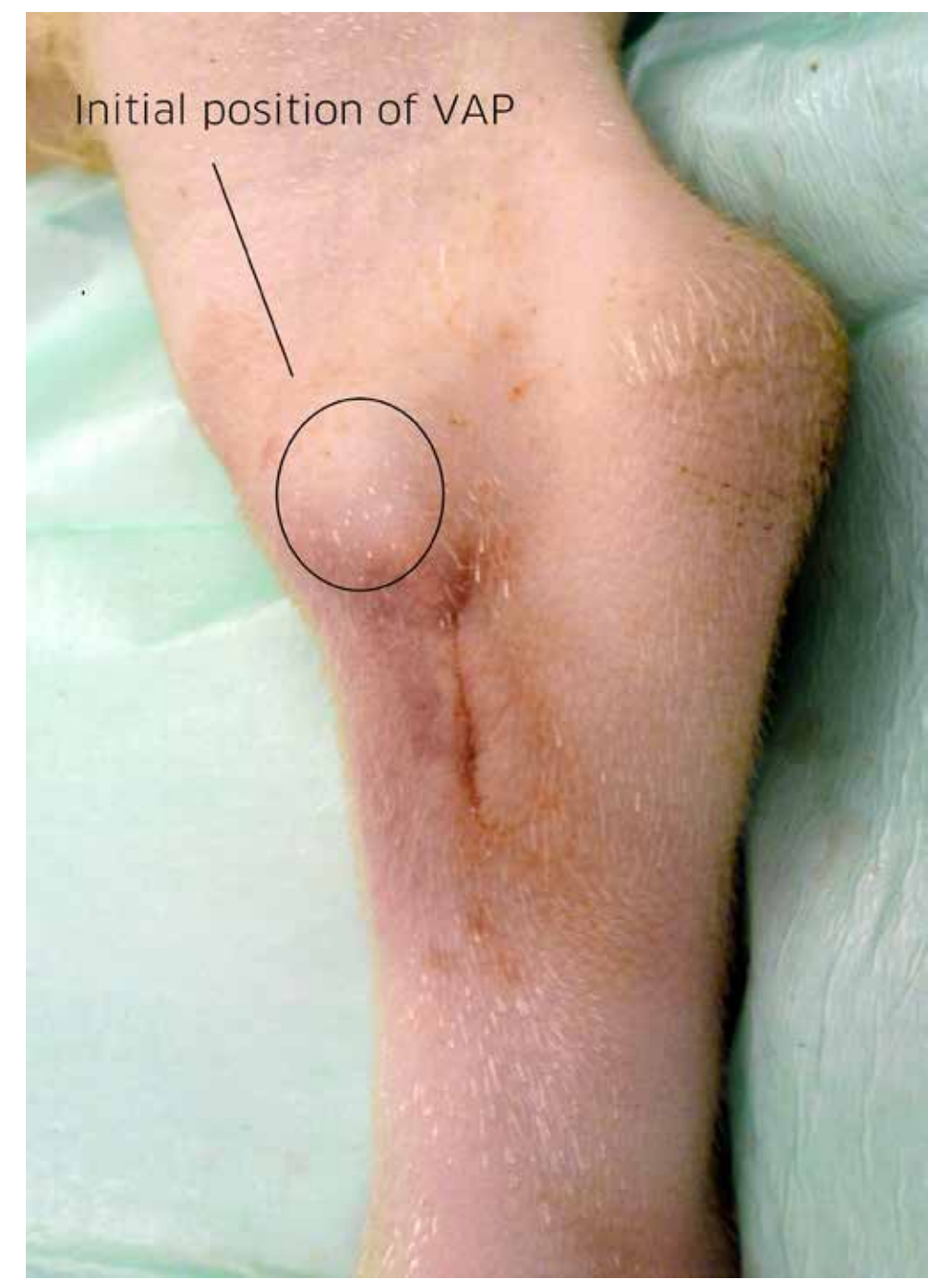
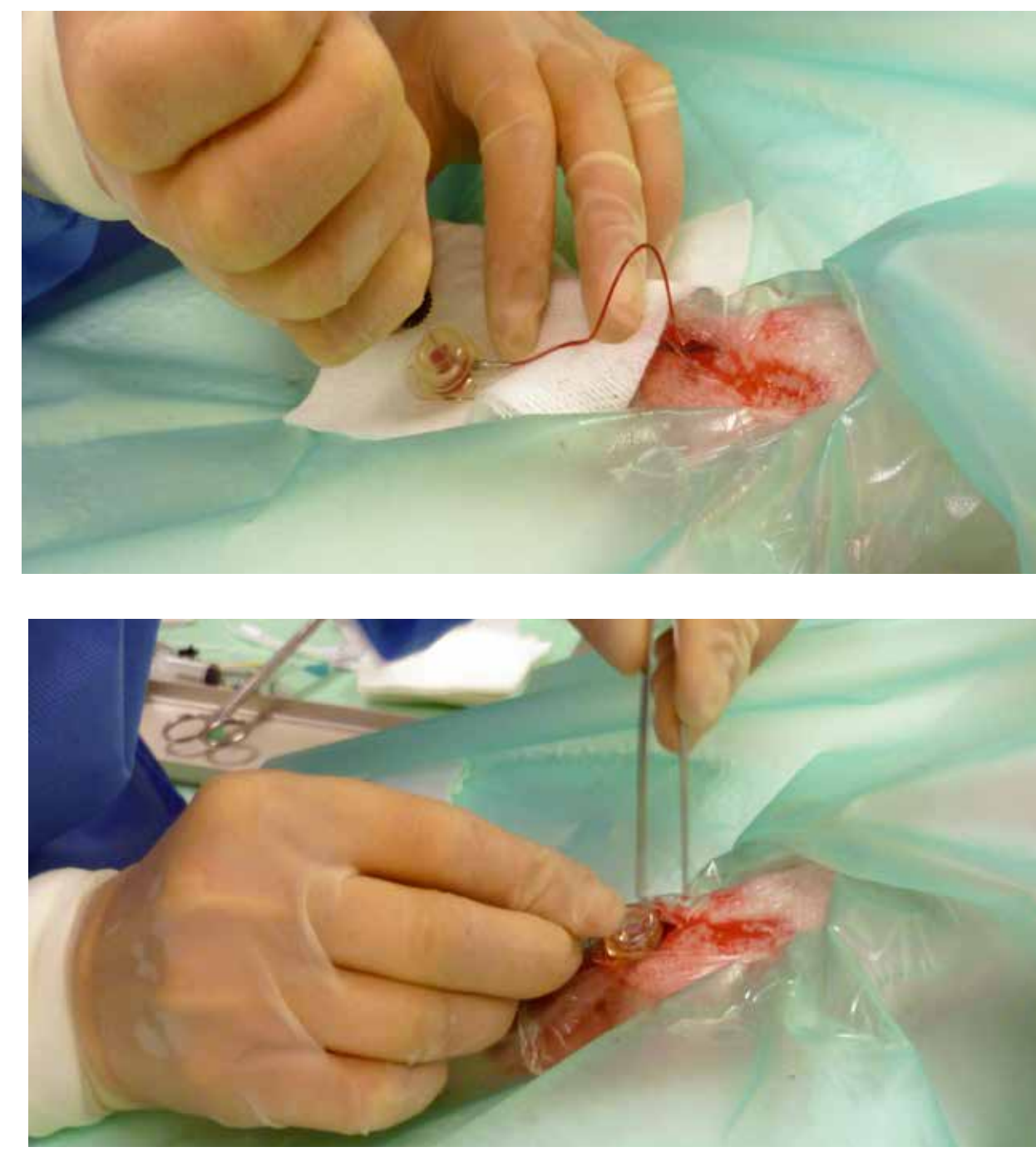
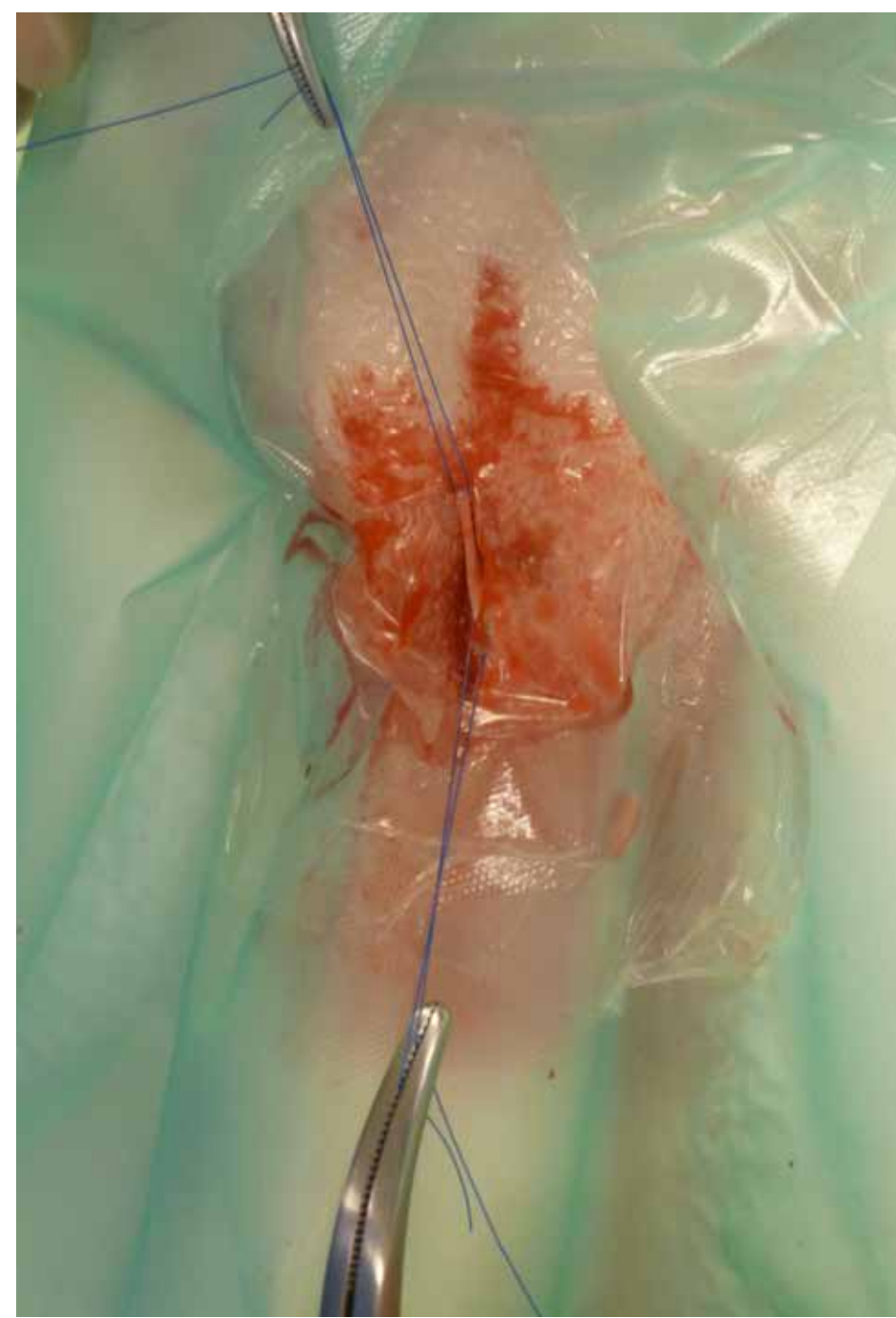
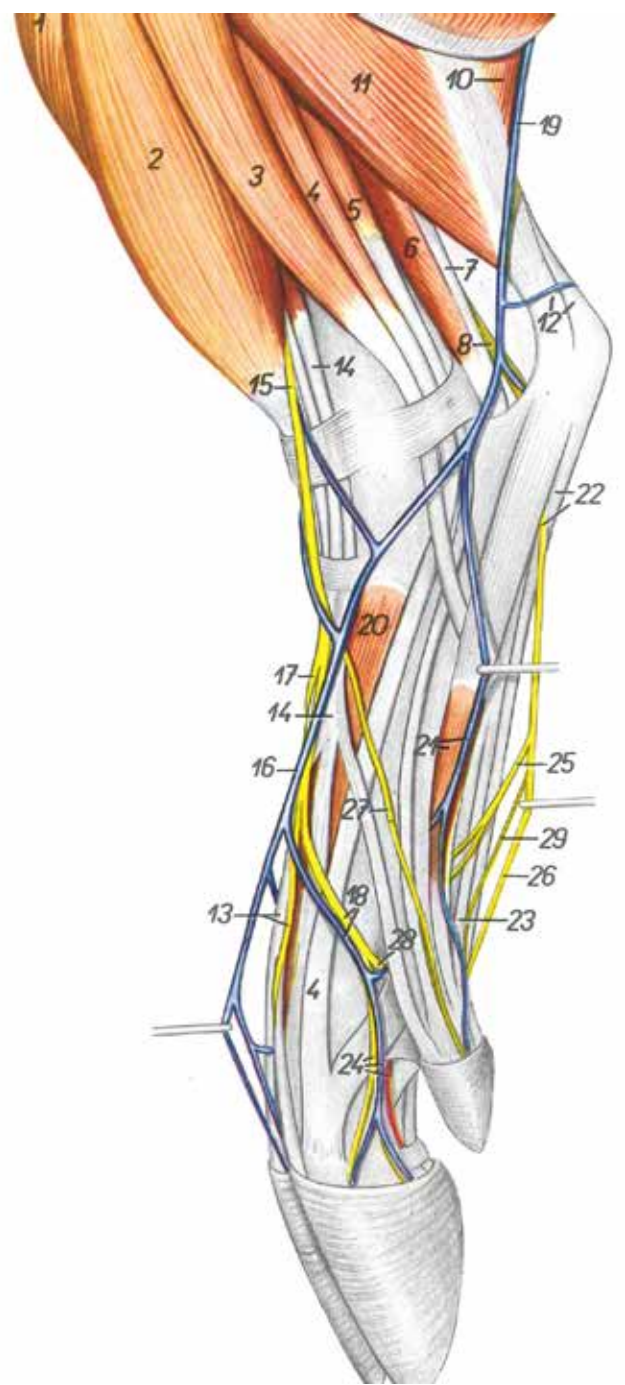
Introduction:

A Catheter with VAP is a fully implanted system and is designed for long-term vascular access. The advantage is that animals can be group housed, as there are no bandage and no exterior parts. A VAP is helpful to collect serial blood samples from Minipigs and for repeated i.v. dosing. Implanting Catheter with VAP is common in various species including human.

Sites commonly used in Minipigs are: Insertion in external V. jugularis with port around shoulder or back and Insertion in V. femoralis with port on the hip.

In studies with NHP, catheters have been implanted in V.saphena, with the tip of the catheter in V.cava caudalis and a port placed around the knee. This was found to be less invasive, faster to implant, and led to better recovery for the animals. Over all, a refinement of a procedure in the sense of the three R's. The aim of the present study was to transfer this technique from NHP to Göttingen Minipigs.

Anatomy and Procedure:



Textbook and reality: In the Göttingen Minipig the V. Plantaris (21) is like a continuation of the V. Saphena (19) with the same size lumen. The side branch (16) is much smaller.

Initially 5 male Göttingen Minipigs aged 10 months were included in the study. With a single incision, the vein was isolated, the catheter inserted and tested, and the attached port was placed in a subcutaneous pocket laterally from the incision site and closed up. The VAP is on top of the tibia to have some resistance when accessing the port.

Results:

The procedure is quick and smooth and recovery was uncomplicated. However, the location of the port craniolateral from the incision site, on top of the tibia proved suboptimal as all pigs developed skin abrasions when they were resting or sleeping. The abrasions were at the site where the septum of the port was located and affected access to the port and led first to superficial infection which spread to the actual port. This was assessed to be a humane endpoint, and subsequently two other sites for the port were tested. After initial tests on cadavers one animal for each site was implanted with a VAP as to the earlier protocol and let to recover. Implantation was just as easy as before. After 7 days the animals were sacrificed and the individual sites macroscopically examined. Superficially no abrasions or other undesirable response to the implantation could be detected. Cutting down to the port revealed no other tissue reaction than normally would be expected in the healing process.

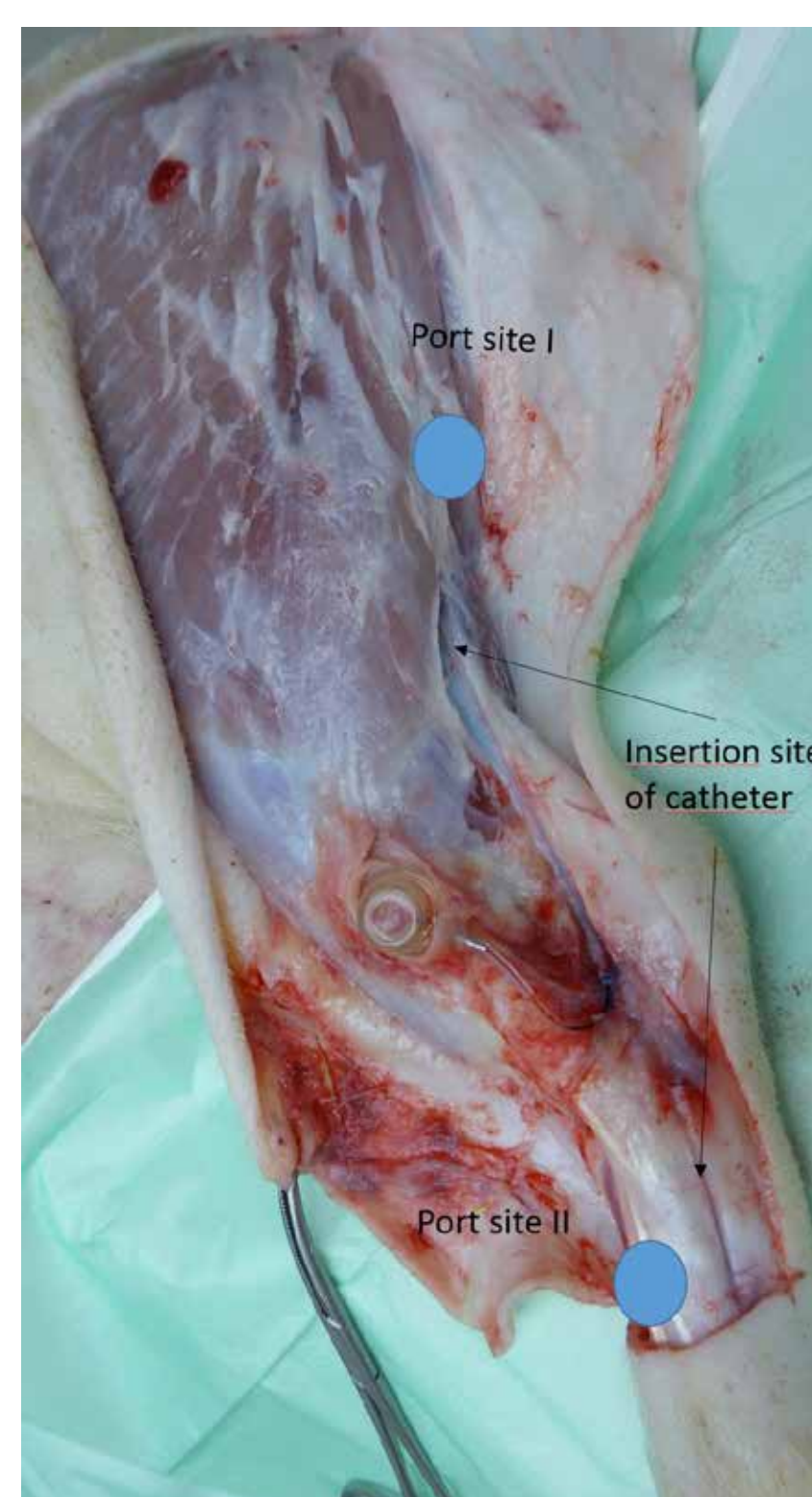
Sites:

Selecting port sites, we learned, is very important. NHP are athletic and can reach almost all sites with their hands; one criteria when choosing a site. A Minipig is cannot interfere with their hind legs so the site chosen first was judged safe. Ease of access to a VAP is assisted by placing the ports on top of a hard anatomical structure to provide resistance for penetration.

Initial site: lateral on the tibia; easy to access but caused lesions probably by the interaction of the bulge that the port created and the floors in the pen when the Minipigs were resting.

Site I: Insertion of the catheter more proximal with the port caudally on the rump. As there is hard structure around it is a bit difficult to palpate the port and it can easily twist to reduce ease of access.

Site II: Catheter insertion more distal, port cranial and on top of Metatarsals. The pocket for the port is a bit tight, special care needs to be given to suturing the incision as there is a bit of strain initially. The animal does not seem to be bothered by the port and has normal gait and posture. Easy access as port is exposed and sits very firm.



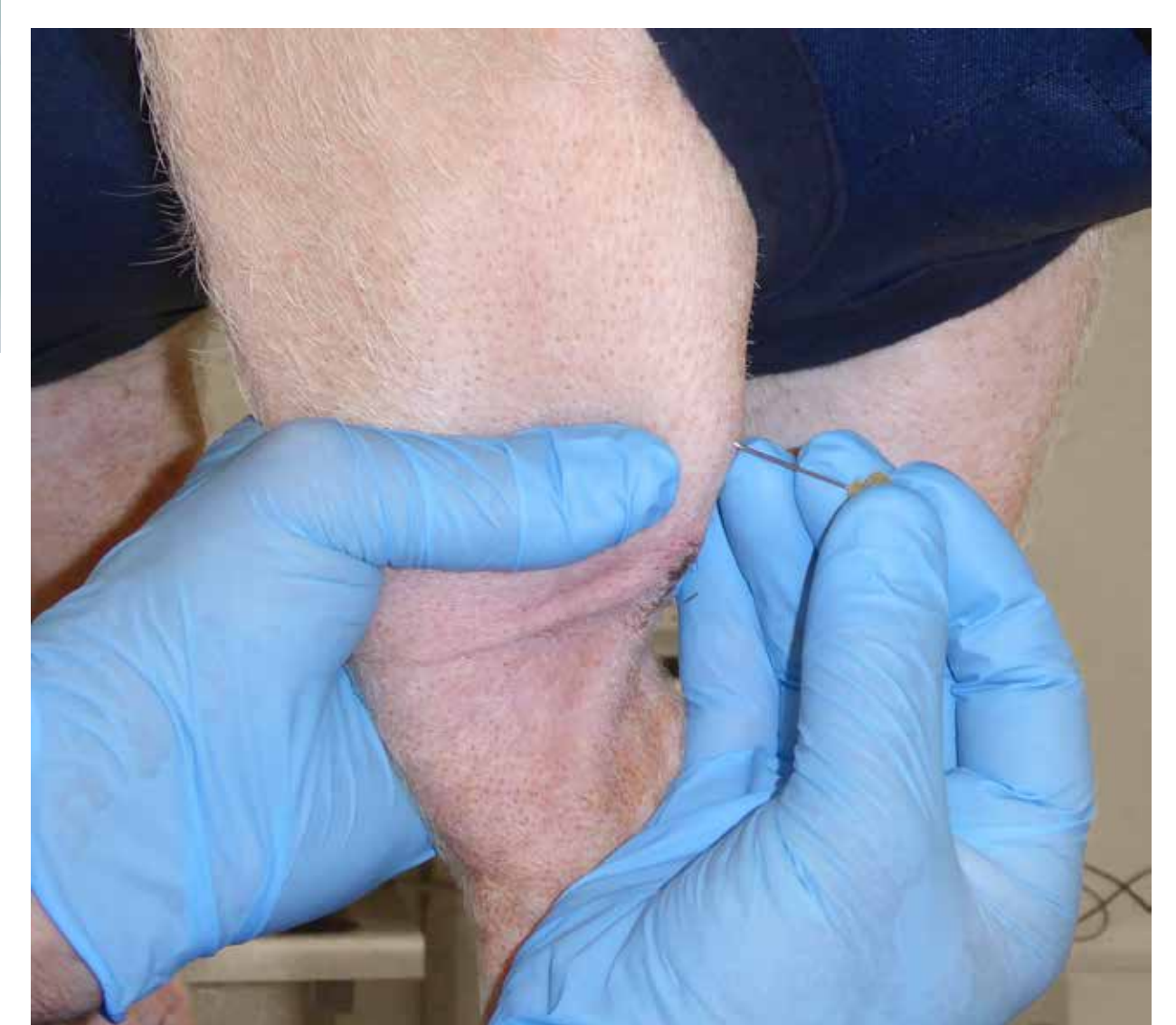
The different sites



Abrasion



Site II



Access to site I + II

Conclusion and Discussion:

Catheter and port can easily be implanted with one incision and is less invasive than other methods. Site II is the site of choice both for ease of access and anatomical position. Further studies are needed to investigate the long term viability of this system.

