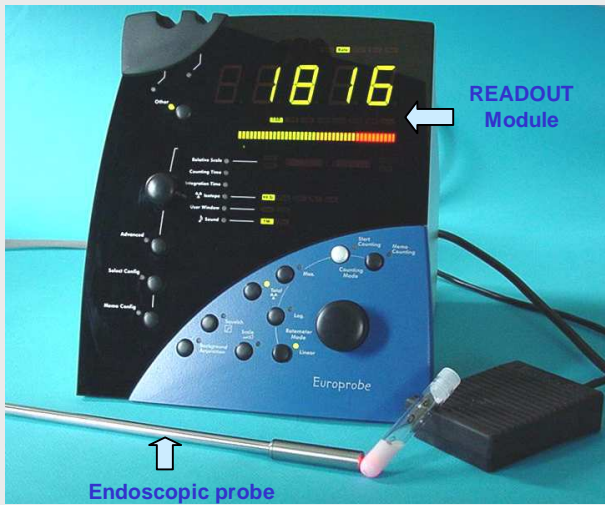


Dual opto-nuclear endoscopic probe system



The new dual opto-nuclear probe is designed for the per-operative sentinel lymph node localization based on radiation and tissue coloration detection.

Two main methods are now used for a per-operative lymph node localization:

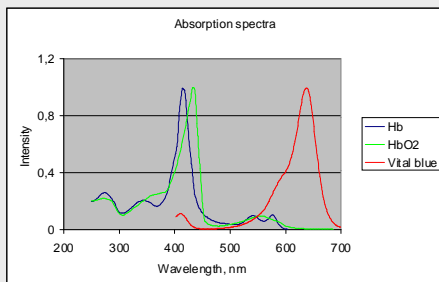
- the first one consists in a vital blue dye injection and direct visualisation of the colored nodes after diffusion in tissues
- the second method is based on the injection of specific marker containing a colloidal substance labeled with a gamma emitter (^{99m}Tc as albumin or nanoparticles of Rhenium sulfure). The radioactive uptake of the node is determined using a gamma probe based on CdTe.

The sensitivity of the sentinel lymph node localization **using one or the other method** is less than 80 %.

The **combined use of these two methods thanks to a dual opto-nuclear probe allows to reach almost a 100 % sensitivity for the sentinel lymph node localization.**

The dual opto-nuclear probe is especially useful in case of a very low, eye invisible, blue dye coloration of the sentinel node.

Principle of the optical method



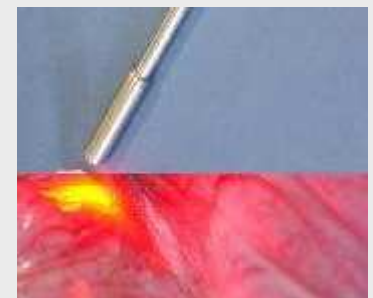
In vivo tests:

- 14 female pigs (~30 kg each)
- 8 animals in laparotomy
- 6 animals in laparoscopy

For each animal both:
blue dye and radio-isotope injection

Lymphatic mapping in:
- sigmoid mesocolon
- right colon and gastric area

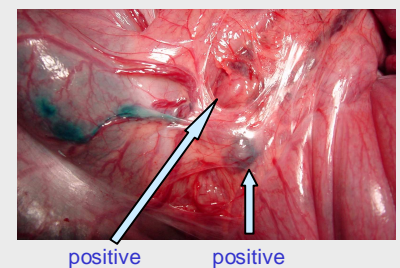
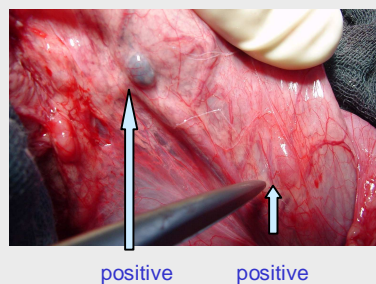
Porcine model tests



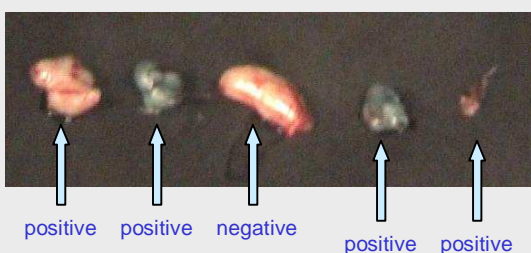
In vitro tests

Lymph nodes from pigs

Right Colon nodes



SIGMOID nodes



Results

Laparoscopic lymphatic mapping was feasible in all 6 attempted pigs. In 100% of the cases, one or several sentinel nodes in the mesosigmoid were identified by the blue dye technique. The gamma probe failed to detect the sentinel node in 3 of these animals. One or more sentinel nodes were identified in the right mesocolon only in 5 pigs out of 8 (62%). In the gastric area the blue dye technique identified the sentinel nodes in 100% of the cases and the radio-active technique only in 75% (6 of 8 pigs) Automated quantitative tissue coloration detection led to the recognition of additional nodes that did not appear colored.