**Medical Devices/ ICT**

Advanced simulation platform for training the selective biopsy of the inguinal sentinel node

A research group of the Andalusian Public Health System in collaboration with the Polytechnic University of Catalonia, has developed an advanced simulation platform that allows the correct initial learning and training of the selective biopsy of the inguinal sentinel lymph node prior to human practice.

>> Oficina de TRANSFERENCIA DE TECNOLOGÍA
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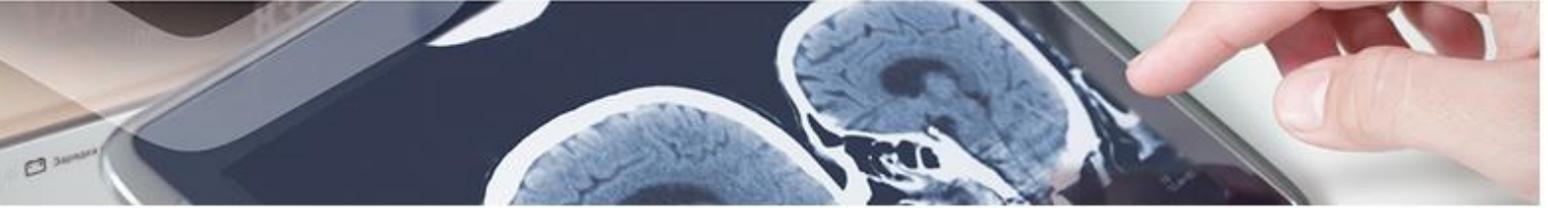
Description

Sentinel lymph node biopsy (SLNB) of the groin is a surgical technique that is performed in patients with melanoma, and genital cancer, among other tumors, to know the presence of metastases in the lymph nodes of the region. The SLNB is a minimally invasive procedure but due to the anatomical relationships of the lymph nodes with large vessels and nerves can expose the patient to relevant lesions. Currently, SLNB has a complication rate of 11.3%, with a higher frequency of complications in the groin (14.9%), followed by axillary (9.8%) and cervical (5.1%). The realization of the SLNB with the maximum safety for the patient requires, therefore, an adequate learning of the surgeon. Among the most outstanding models of surgical learning are the animal models, the corpse, the physical or mechanical simulation, and the most recent virtual reality, telementorization and robotic teleassistance. However, there is still a need to develop learning systems for the SLNB technique training to ensure the success of actual surgery.

Our researchers have developed and validated a hybrid advanced simulation platform (physical reproduction of the anatomy together with a set of sensors, actuators and control, measurement and evaluation software) of the SLNB of the inguinal region that reproduces precisely the regional surgical anatomy, physiological functions, navigation and identification of the sentinel lymph node, the dissection and repair maneuvers of the tissues, and that allows to analyze the execution of the procedure. The use of this learning platform before live surgery will allow the surgeon in training to acquire the necessary skills prior to performing the procedure *in vivo*, minimizing its exposure to possible complications derived from the inexperience of the operator, maximizing safety of the patient and reducing time and costs of the operating room.

Advantages

-   Reproduces the surgical anatomy and texture of the tissues, as well as the physiological functions (arterial pulse, nerve impulse, hemorrhage).
-   It allows the training of basic surgical maneuvers (dissection of soft tissues, vessels, sutures of planes), resolution of critical events (hemorrhage, vascular suture), and the recording and analysis of the execution of the surgical procedure and evaluation of learning.
-   Simulates navigation to the sentinel node without the need to use radioactive isotopes.
-   Its use could be extended to armpit, neck, etc.

Intellectual Property

This technology is covered by an international patent application (PCT).

Classification

Area: Medical Devices/ ICT
Pathology: Oncology/ Hematology