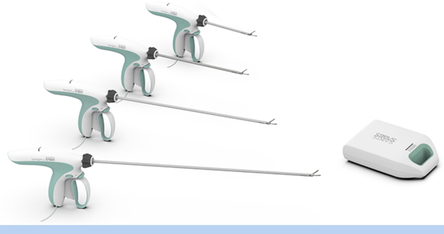
A NOVEL INTEGRATED ULTRASONIC SCALPEL BASED ON THE REAL-TIME TISSUE EFFECT II (RTTE II) ALGORITHM

Chris Hu,PhD

Shanghai Saints Sages Surgical Co., Ltd

Objective

Surgical ultrasonic scalpels are commonly used in various types of surgeries. Traditional systems typically consist of a large external generator, a handle, and a transducer. This abstract introduces a new integrated ultrasonic scalpel with an embedded transducer and a portable controller, eliminating the need for bulky generators. The system is powered by the SanAgile™SA10 portable controller and the SASD ultrasonic surgery advanced dissector (Shanghai Saints Sages Surgical Co., Ltd.).



Technology Description

The SanAgile™SA10 portable controller weighs just 0.6 kg(equivalent to a smartphone), making it compact and highly portable. Its size (190mm(L)x120mm(W)x52mm(H)) allows easy management in the operating room by surgical staff and provides flexibility for surgeons working in remote locations or emergency settings.

The portable controller features the Real-Time Tissue Effect II (RTTE Il) algorithm, which can recognize over 30,000 types of tissue. It adapts the ultrasonic energy output in real-time, providing continuous, precise energy transmission. More than 50,000 adaptive signals are exchanged between the scalpel and the controller to maintain optimal power and accuracy.

Method of Use and Application

The device requires only two simple steps for setup:

Connect the power cord to the controller and an electrical outlet; the controller will illuminate with a green "breathing" LED when the self-test is complete.

Attach the scalpel's dissector plug to the controller, and the LED on the scalpel will turn green with an audio beep when it passes the self-test.

This process takes only 2-5 seconds, significantly faster than traditional ultrasonic scalpels and generators. The system is suitable for a wide range of surgeries, including general, thoracic, urological, thyroid, and gynecological surgeries. It is available in four shaft lengths (14cm, 23cm, 36cm, 45cm) for both open and laparoscopic procedures.

Preliminary Results

Preliminary studies, including animal testing and human clinical trials, demonstrate that the SanAgile™integrated ultrasonic scalpel performs 17% faster in cutting speed compared to competitive products. In terms of coagulation, the SanAgile™ scalpel's bursting pressure is 149% higher than its competitors. No significant statistical difference in cutting precision was found between the SanAgile™ system and international competitive brands(1.67mm vs1.46mm,p=0.138).

Conclusions

The SanAgile™SA10 portable controller and SASD ultrasonic surgery advanced dissector represent a novel, effective solution for modern operating rooms. The system is recommended for use by surgeons seeking improved performance and convenience in ultrasonic surgery.