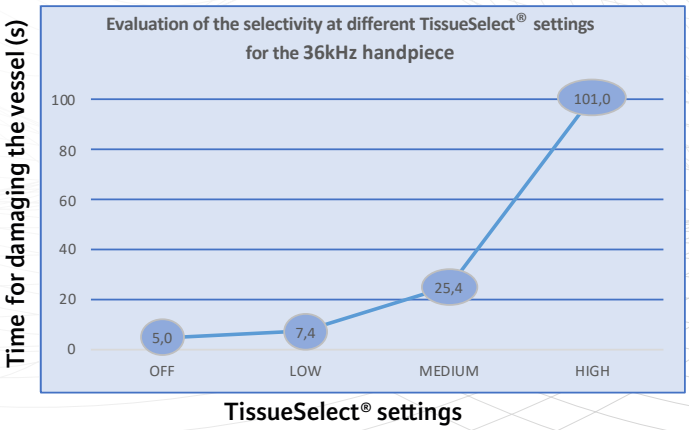
CUSA® Clarity - Selectivity study

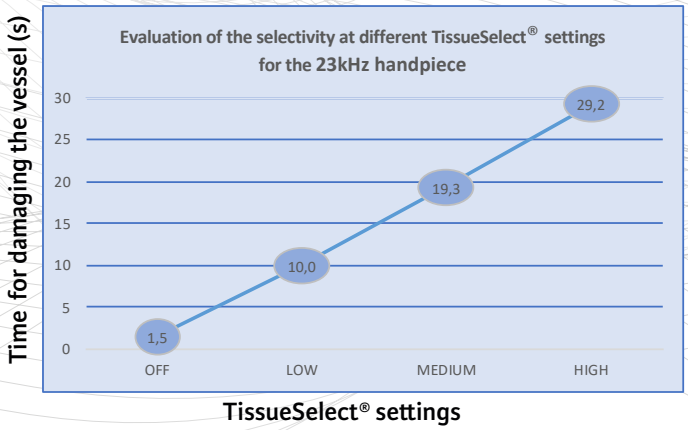
TissueSelect® mode increases control and selectivity to reduce the risks of damaging critical structures

A study was conducted in partnership with Prof. Patrick Pessaux, in order to determine the impact of the TissueSelect® mode settings on the preservation of blood vessels. Professor Patrick Pessaux is the Head of the Hepato-Biliary and Pancreatic surgical Unit in the Department of Digestive and Endocrine Surgery at the University Hospital of Strasbourg, a Professor at the University of Medicine of Strasbourg, and a Researcher in the field of hepato-biliairy and pancreatic diseases and of minimally invasive surgery at the IRCAD Institute of Strasbourg.

STUDY RESULTS

Selectivity is maximized when using TissueSelect® with both CUSA® Clarity handpieces
Thanks to the activation of TissueSelect® mode, the surgeon had more time to react before damaging the vessel.
A LOW TissueSelect® setting used for the 23kHz handpiece provided 6 times more time before damaging the vessel wall, compared with standard settings (off mode). Both 23 kHz and 36 kHz handpieces showed higher selectivity when TissueSelect® mode activated.





STUDY DESIGN

Objective: to assess the impact of TissueSelect® on vital structures
Material and Methods: 10 tests on one pig operated on with CUSA® Clarity using TissueSelect® mode set up from 0-Off to 4-Max

- First 5 tests were done with the 23kHz handpiece.
- The console set up was: Amplitude 40% from a maximum of 422µ, Irrigation 4mL/min and Suction at 40% from a maximum of 640mmHg.
- The following 5 tests were done with the 36kHz handpiece.
  The console set up was: Amplitude 60% from a maximum of 210µ, Irrigation 5mL/min and Suction at 55% from a maximum of 640mmHg.
- Video recording to calculate the time for damaging a blood vessel
- Surgery Process
  1. Liver resection to access a deep-seated vessel (using standard surgeon's settings)
  2. Localization and skeletization of the blood vessel (Video starts when the vessel is skeletonized)
  3. CUSA handpiece tip **maintained on the vessel** until the vessel gets damaged
  4. Control of the hemostasis once the vessel is damaged

LIMITATIONS & DISCUSSION

- Pressure on the vein not strictly constant → The surgeon pushed harder when increasing the level of TissueSelect®
- Angle between tip and vein not strictly the same over the test
- Increased fragility of the vein over the test → Quick time for damage for the test N°10 (23 kHz – mode max). Therefore data not included for MAX mode.

CUSA® Clarity
Ultrasonic surgical aspirator

Source : Pr Patrick Pessaux – Digestive and Hepatic surgery – IHU Strasbourg IRCAD – Research Institute against Digestive Cancer

SPEED & SELECTIVITY
CUSA® Clarity

CUSA® Clarity - Selectivity study

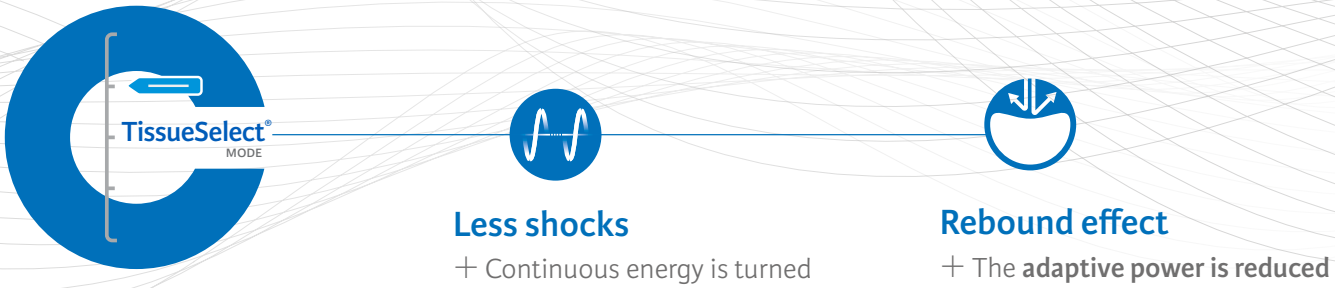
TISSUE SELECT® MODE: Increases control and selectivity to reduce the risks of damaging critical structures

The CUSA® Clarity System is an ultrasonic surgical aspirator that allows a surgeon to remove tissue efficiently and selectively. It has four adjustable parameters: **Amplitude, Suction, Irrigation** and the unique **TissueSelect® mode.** They allow the surgeon to set up the tissue resection speed and the selectivity level.

Ultrasonic ablation differentiates between viscous/hydrated tissues and elastic/collagen-rich tissues by means of cavitation. **Cavitation** is the formation and collapse of bubbles, due to the movements of the Tip, that creates a chaotic stress field. This field fragments viscous/hydrated tissue more easily than elastic/collagen-rich tissue. **Cavitation** is linked directly to the **Amplitude**, and by consequence determines the impact on the tissue and the speed of resection.

The **TissueSelect® mode** is a unique feature to CUSA® and differentiates from the Amplitude. It increases selectivity to reduce the risks of damaging critical structures (vessels, pia matter, bile ducts), while limiting the decrease of the Amplitude, and thus the Cavitation effect, to maintain the speed of resection on viscous/hydrated tissue.
The **TissueSelect® mode** allows the surgeon to **optimize the combination of Speed and Selectivity.**

How does it work ?



Less shocks

+ Continuous energy is turned to **pulsed energy**, to reduce the number of strokes received by the tissue.

Rebound effect

+ The **adaptive power is reduced** to limit the additional energy delivered ordinarily to tougher structures.

Indications : The CUSA® Clarity Ultrasonic Surgical Aspirator System is indicated for use in these surgical procedures where fragmentation, emulsification and aspiration of soft and hard tissue is desirable : Neurosurgery, Gastrointestinal and affiliated organ surgery, Urological surgery, General surgery, Orthopedic surgery, Gynecological surgery, Laparoscopic surgery.
Contraindications : This ultrasonic aspirator device is not indicated for and should not be used for the fragmentation, emulsification, and aspiration of uterine fibroids.

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