

LigaSure™ 5-mm Blunt Tip Laparoscopic Instrument

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About the Reviewer



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Instrument Review

LigaSure™ 5-mm Blunt Tip laparoscopic instrument is the latest sealer/divider from Medtronic (Dublin, Ireland). LigaSure™ technology has been used since 1998 and there are a variety of instruments for use in both laparoscopic and open procedures. I have been using this instrument along with the Harmonic Scalpel (Ethicon Endosurgery, Somerville, NJ) for many years now.

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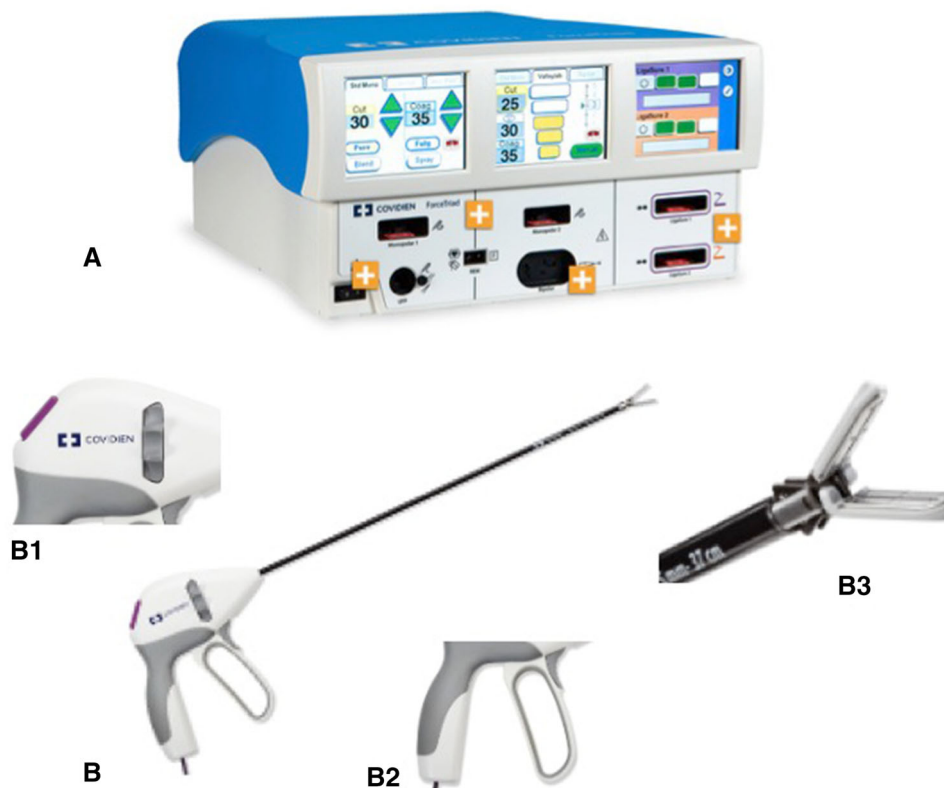
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LigaSure™ uses a combination of pressure and continuous bipolar energy to create vessel fusion. LigaSure™ seals vessels by applying high, uniform mechanical compression while monitoring and adjusting energy delivery to the tissue. Collagen and elastin fibers in the compressed vessel walls are denatured; during the cool-down phase, crosslinking reoccurs, effectively creating a new, solid wall of collagen and elastin tissue. An algorithm in the generator determines optimal time and energy delivery to achieve consistent seals for vessels as large as 7 mm in diameter.

The energy source is the ForceTriad™ energy platform (Fig. 1A), designed to precisely manage energy delivery, creating a range of options for desired tissue effect. There is a feedback-controlled response system (TissueFect™ sensing technology), which automatically discontinues energy delivery when the seal cycle is complete, eliminating the guesswork. TissueFect™ sensing technology monitors changes in tissue impedance 3333 times a second,

Fig. 1 **A** The ForceTriad™ Energy Platform is the energy source that is used. **B** The LigaSure™ 5-mm Blunt Tip laparoscopic instrument with detailed view of the base (*B1*), handle (*B2*) and the jaw (*B3*)



and adjusts energy output accordingly to deliver the appropriate amount of energy for the desired tissue effect.

LigaSure™ works quickly with an average seal cycle of 2–4 s. LigaSure™ vessel sealing technology has a 95 % probability of a burst pressure greater than three times normal systolic blood pressure. This means there is increased vessel-sealing reliability and consistency in the operating room. This can be useful when operating on vascular pedicles as seen during myomectomy or hysterectomy [1].

Other sealing systems currently available include [2]:

- (1) The Gyrus PK tissue management system™ (Gyrus ACMI, Southborough, MA) which uses bipolar energy that is pulsed.
- (2) Harmonic Scalpel™ (Ethicon Endosurgery, Somerville, NJ) which uses a high-frequency ultrasonic transducer (55,000 cycles/s) to create mechanical vibration of one of the two jaws. A microprocessor-controlled generator detects changes in the feedback acoustic pattern. Applying pressure and then sealing with a denatured protein coagulum while applying ultrasonic vibration to denature hydrogen bonds perform vessel coagulation. It has the least thermal spread and smoke production of all the devices. The older versions of the device, however, had poor reliability when it came to sealing blood vessels [3]. However, the new Harmonic Ace™+7 shear uses

pure ultrasonic energy and has a stronger large vessel-sealing indication. It can coagulate vessels up to 7 mm in diameter with the use of the Advanced Hemostasis hand-controlled button.

- (3) EnSeal PTC Tissue Sealing and Hemostasis System™ (SurgRx, Redwood City, CA) also uses bipolar electrical energy but employs a nanotechnology feedback mechanism to control the energy at the electrode–tissue interface. The jaws contain a temperature-sensitive matrix with embedded conductive carbon spherules designed to “sense” tissue characteristics. It uses extremely high jaw compression to create uniform tissue effects. It does not require a dedicated electro-surgical unit for use; an adapter can be purchased that permits use with most generators. The LigaSure™ device has the highest “burst pressure” (pressure required to induce leakage in the vessel) and fastest sealing time compared to the other three devices.

The advantages of the LigaSure™ include (1) highest burst pressure and fastest sealing time compared to the other sealing devices. (2) Reduced blood loss compared to sutures and clips [4]. (3) Reduced procedure time and patient length of stay compared to sutures. (4) Significantly reduced operative blood loss, reduced procedure time, and shorter hospital stay compared to mechanical ligation techniques.

The latest version of the device has been modified for improved blunt dissection and better stability. The handle

is ergonomically designed for greater comfort and reduced fatigue (Fig. 1B1, B2). An obvious disadvantage of the LigaSure™ device is the cost as it is a sterile, single-use-disposable instrument.

The LigaSure™ 5-mm Blunt Tip laparoscopic instrument is manufactured by Covidien (Boulder, CO), which was recently acquired by Medtronic (Dublin, Ireland).

Shaft lengths: 23, 37, and 44.

Shaft diameter: 5 mm.

Jaw type: blunt, double-action with contoured tips (Fig. 1B3).

Jaw surface: textured with ceramic stops. Jaw is 9 % wider than its predecessor.

Order information

Ordering codes: LF1623, LF1637, LF1644.

Order quantity: 6 units/case.

The LigaSure™ 5-mm Blunt Tip laparoscopic instrument is used along with the ForceTriad™ energy platform. This is an all-in-one unit compatible with conventional electrosurgical instruments and all current LigaSure™ instruments.

Order information

Ordering codes:

ForceTriad: ForceTriad™ energy platform,

FT900: ForceTriad™ cart,

FT950: ForceTriad™ cart front panel, and

FT990: ForceTriad™ cart drawer.

The contact information for ordering in India is Covidien Healthcare India Private Limited. Building No. 9B, 10th Floor, DLF Cyber City, Phase-III Gurgaon – 122002, Haryana.

Telephone: +91 124 4709 800.

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Compliance with Ethical Standards

Conflict of interest Dr. V. Karande declares that he does not have any conflict of interest.

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