*Our Technology, Your Health.*

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**Global Brand**
**BONSS Plasma Tech**

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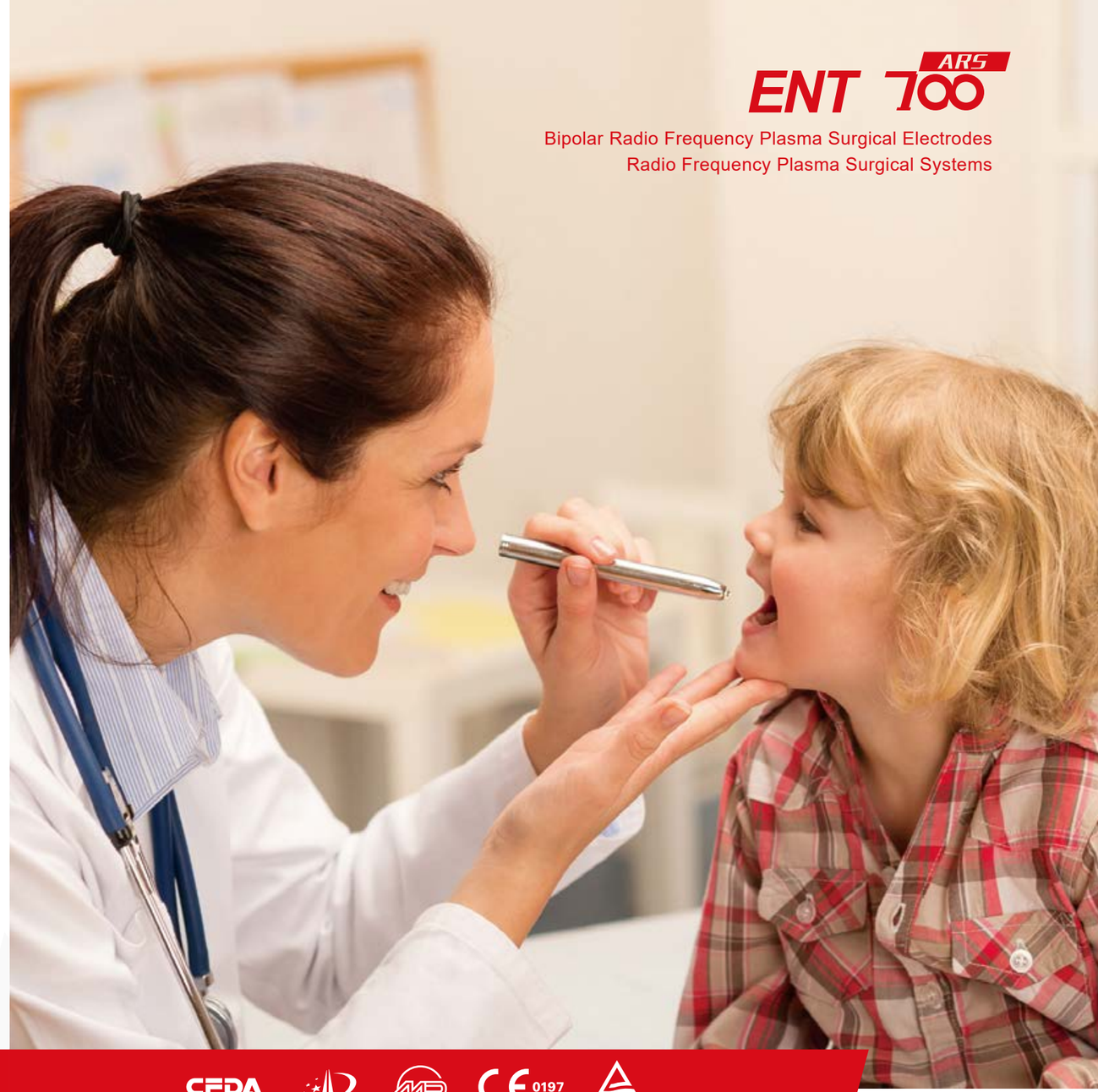

# ENT 700 ARS

Bipolar Radio Frequency Plasma Surgical Electrodes
Radio Frequency Plasma Surgical Systems

CFDA CE 0197 TÜVRheinland

BONSS® MEDICAL

*An overall solution of open surgery*

# *ORL-HNS Thyroid Tumor Surgical System*

Indicated for head and neck lymph node dissection, thyroid tumor open surgery,
cutting & coagulation in open surgery of breast tumor.

**AC/BC/MC 303**


Patented Design
Bilateral Irrigation & Suction
Working with specialized generator,
with the benefits of low working temperature
and high efficiency.

*Thyroid-Forceps*

## Integrated Design

**With cutting, ablation, hemostasis, coagulation, peeling, clamping and suction capabilities in one versatile device.**

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*An overall solution of ENT surgery*

# *Laryngeal Tumor Surgical System*

Intended for suction, cutting, ablation, coagulation and hemostasis in laryngeal surgery, particularly useful for pediatric patients with narrow laryngeal structure and the laryngeal minor pathologies.

**AC/BC/MC 403**

## Thinner, Longer, More Precise

**For the deep laryngeal pathologies**

Thiner 1.9mm

Longer 290mm

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### Patented Innovative Design, Improved Anti-blocking Capability

Patented L-shaped plate tip design, for higher ablation rate and optimized anti-blocking capability
Innovative design of curved tip surface and bilateral suction ports, makes the suction range expanded to 2.2mm², increased by 3 times than the other laryngeal design, to reduce the blockage risk.

### Integrated Design with 2.5mm Diameter Tip

Precise design, with cutting, ablation, coagulation, hemostasis, irrigation and suction capabilities in one versatile device.

### Reduced Thermal Damage

The electrode tip adopts special ceramic design, with insulation scope reaching 67%;
Plasma energy sheath is controlled at 100μm, with the collateral thermal damage reduced by more than 50%.

### Higher Cutting & Ablation Rate and Optimized Coagulation Capabilities

With L-shaped design, it can work at both sides of the tips, which effectively enhances the cutting, ablation and coagulation capabilities. Intended for the precise cutting and ablation in laryngeal surgery.
With coagulation capability increased by 30% and the cutting/ablation capability increased by 50%.

### Anti-gravity Design

Crescent-shaped anti-gravity design of the irrigation port, ensures smooth and even saline irrigation to cover the whole tip surface, for effective and continual plasma creation.

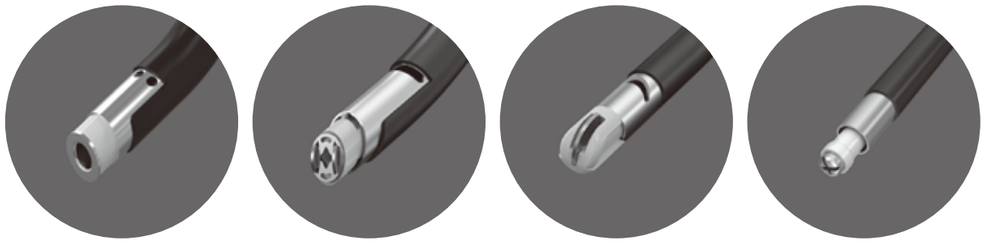
### Thinner, Longer, More Precise

Bendable shaft of 2.5mm diameter and 190mm length is particularly useful for complex laryngeal structures, making it possible to reach into the larynx and the position below the glottis for precise cutting, ablation and accurate coagulation.

### Excellent Clinical Performance

Powerful cutting, ablation and coagulation capability, to expand the clinical applications.
The small diameter shaft design can be selected for the treatment of laryngeal pathology in minimal 4-months newborns, and even congenital throat stenosis or occlusion in newborns.

*Various sizes are available for selection*



*Laryn-Max* *Laryn-Blator* *Laryn-Neo* *Laryn-Mini*

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*An overall solution of ENT surgery*

# Neurosurgery & Skull Base Tumor Surgical System

Indicated for nasal surgery of sinus tumor, nasal skull base tumor and hyperplasia. Suitable for narrow area operation, particularly useful for narrow surgical site in pediatric surgery.

**AC/BC/MC 402**

*NasaBlator*

## Overall Upgrade

### *Stronger Capability of Cutting, Ablation, Coagulation and Hemostasis*

Double U-shape structure for aggressive ablation rate, to achieve excellent clinical effect. Double U-shape structure for aggressive ablation rate, to achieve excellent clinical effect.

### *Improved Suction Capability*

Double U-shape structure tip design, with optimized suction performance;
The cross-sectional area of the suction port is designed bigger, to achieve a smooth saline flow, and clear surgical view.

### *Thinner Shaft*

Shaft diameter ranges from precise 3.8mm to regular 4.4-6.0mm.
The precise 3.8mm design is particularly useful for precise cutting, ablation and coagulation in the complex surgery of pediatric, nasal, nasal skull base, small orifice site, etc.

### *Safer Operation*

Anti-gravity unidirectional flow design maintains a smooth irrigation and suction.
Precise energy penetration control reduces collateral thermal damage and electrical leakage risk, to ensure safe operations.

## Patented Design for Nasal and Nasal Skull Base Surgery

- Flexible shaft and various tip size are available for clinical selection.
- Excellent solution for narrow anatomical structure, with improved surgical view in structural pathology.
- Clinically tested and approved for accurate and safe ablation, cutting, coagulation and hemostasis under endoscopy.

*Various sizes are available for selection*

*An overall solution of ENT surgery*

# Nasal, Nasal Skull Base, Oropharyngeal Surgical Electrodes

Indicated for ENT surgery of nasal sinus, nasal skull base, nasal cavity hyperplasia surgery, and narrow site surgery, such as pediatric tonsillectomy & adenoidectomy.

**AC/BC/MC 401**

## UPGRADED

- Carefully Selected and Tested Materials
- Repeatedly Verified Manufacturing Technique
- Reduced Collateral Thermal Damage
- Precise Control of Energy

## *Classic Design, Upgraded Effect*

*Tonsil-Blator*

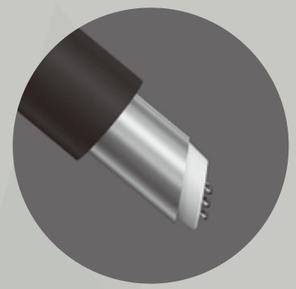
*Tonsil-BlatorPT*

*An overall solution of ENT surgery*

# Tonsillectomy & Adenoidectomy Surgical Electrodes

## Clinical Standardization of Plasma Technology

- Multi-polar technology, with Cutting, Ablation, Coagulation, Hemostasis, Irrigation and Suction capabilities in one versatile device.
- Suitable for the clinical applications of various anatomical site and various pathology.
- Golden standard of plasma surgery.



*Tonsil-BlatorAD*

Pre-bended Tip Design

Particularly useful for adenoidectomy

Patented Design

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## *An overall solution of ENT surgery*

# Nasopharyngeal Ablation Electrodes

Indicated for ablation of soft palate, tonsil, uvula, tongue base, etc.
CAUP and other oropharyngeal surgery.

**AC/BC/MC 303  AC/BC/MC 304  AC/BC/MC 305**

- Sharp tip design for easy channeling.
- The fine shaft design of 1.6mm diameter achieves minimally invasive and precise ablation, and minimal incision.
- The shaft design with markers provides surgeons with scale guide to achieve precise ablation.
- The bending angle of shaft perfectly fits the nasal or oral structure.
- Tripolar structure design, for integrated channeling and ablation.
- Distal two circuits used for channeling, and proximal two circuits used for ablation.

*TurbinEX-C*

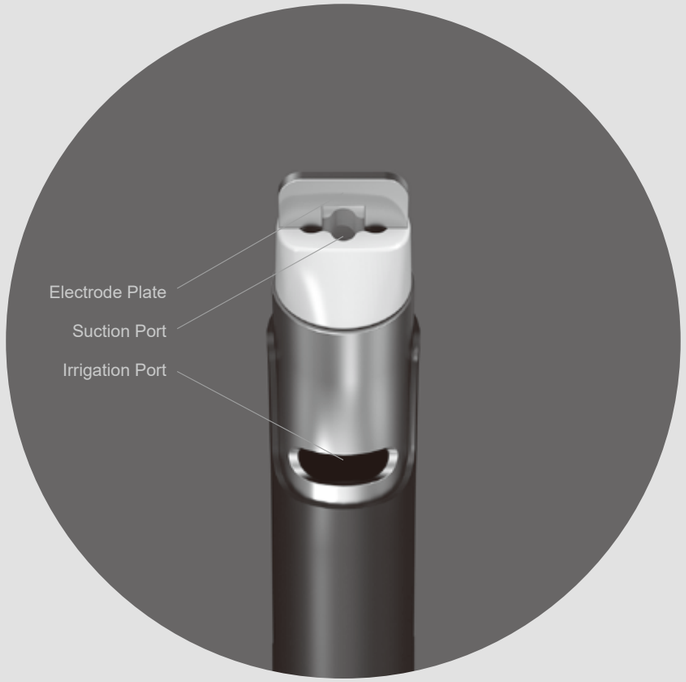


*PalatEX-C*

*Dual-Pole-C*

Bipolar Electrical Design
Used for local precise coagulation, hemostais and ablation.

# *Patented Innovation for Otoscope Surgery*




*Oto-Blator*


## *An overall solution of ENT surgery*

# Surgical System for Open and Endosocpic Surgery

Indicated for otoscope, nasal cavity, neck dissection and other ear and nasal surgery.

# *ARS700 Radio Frequency Plasma Surgical System*


**Global Brand**
**BONSS Plasma Tech**

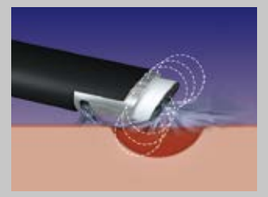
## How It Works

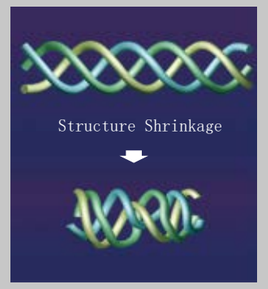
### ABLATE

The Radio Frequency energy flows through active electrode and return electrode, and by the conductive saline solution it generates precisely focused plasma sheath around the electrodes. The plasma sheath consists of massive charged particles which can generate sufficient energy of strong oxidizing when accelerated by the electric field. The generated energy is powerful enough to break the organic molecular bonds within the tissue, and make the tissue rapidly dissolved into molecular and atoms level at a relatively low temperature of 40-70˚C. The device provides rapid and efficient ablation and resection capabilities of soft tissues in a relatively low temperature.

### COAGULATE

When RF energy acts on tissue (including blood), around the electrode tip it generates Joule heat and electromagnetic wave effect which providing an immediate coagulation of tissue protein and sealing of small blood vessels, thus coagulation and hemostasis capabilities of target tissues are realized.
The surgical process by plasma ablation creates well-distributed coagulative necrosis for efficient hemostasis while preserving the mucosa and fibrous tissue. Compared to that of conventional surgical methods, its post-operative recovery is improved.
Different from the traditional thermal coagulation by high temperature, plasma technology can make the working temperature controlled at 40-70˚C, and coagulate helical structure of collagen molecules meanwhile preserving the cells vitality.






## Excellent Performance



### Systematic Working Mode

Two working modes:
ABLATE for resection and ablation activated at Yellow control panel and Yellow foot pedal.
COAG for coagulation and hemostasis activated at Blue control panel and Blue foot pedal.

### Adjustable Coagulation Capability

Enhanced coagulation mode can improve hemostasis capability while providing clear surgical vision.

### Intelligent Control System

Designed with automatic identification of electrodes, foot switch and power supply, which are displayed respectively on the device control panel, and automatic default power output value for different electrode designs.

### Automatic Protection

The electrical circuit system can constantly monitor power output and automatically suspend power output when there is instantaneous peak current. For example, it will automatically suspend radio frequency output when electrode contacts or is close to metal, and automatically resumes work after electrode has returned to a proper distance.

### Ablation with Endoscope

By the channel of nasopharyngolarygnoscope or bronchofiberscope, the electrodes can reach into deep position to perform ablation process. Low temperature avoids risk of smoke and carbonization, providing an innovasive surgical solution for laryngeal disease.

### Foot Switch

The water-proof, pressure-resistant and convenient foot switch has two working modes of ABLATE and COAG, each identified in different colors and working sounds.


### Integrated Function

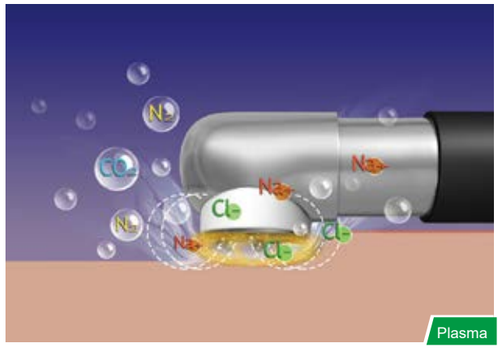
In one versatile single-use electrode, it provides ABLATE for resection and ablation, COAG for coagulation and hemostasis, irrigation and suction capabilities. The integrated suction electrode enhances surgical vision, controlled resection for rapid removal of soft tissues.

### Temperature Control Technology

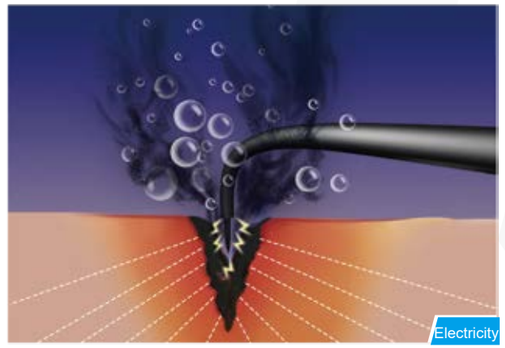
The surgical process by plasma technology is performed at controlled 40-70˚C. It uses a controlled, non-heat driven process in which bipolar radiofrequency (RF) energy excites the electrolytes in a conductive medium, usually saline solution, to create a precisely focused and charged plasma gas. The energized particles in the plasma have sufficient energy to break the organic molecular bonds within tissue, causing tissue to dissolve at relatively low temperatures of 40-70˚C. Radiofrequency current does not pass directly through tissues, causing minimal tissue thermal effect. By temperature control technology, it automatically optimizes output value according to the plasma layer status around the electrode tip and the target tissue feature, by which electrode can provide a stable and efficient capabilities while keeping the lowest working temperature.

### Saline Flow Control Unit

The Saline Flow Control Unit runs synchronously with the generator. It can be turned on or off automatically when the generator is activated or stopped, to ensure sufficient saline for surgical process.


Surgical Wound by Plasma System




Surgical Wound by Electrosurgical System

| Plasma Surgical System | Electrosurgical System |
|---|---|
| Generate Plasma Layer | Arc |
| Break Molecular Bonds | Cells Evaporation |
| 40-70˚C | 300-600˚C |
| Work in Saline Solution | Can't Work in Saline Solution |
| Bipolar | Monopolar |
| Thermal Damage of 1 mm | Thermal Damage of 3-5 mm |
| Not Carbonized | Carbonized |

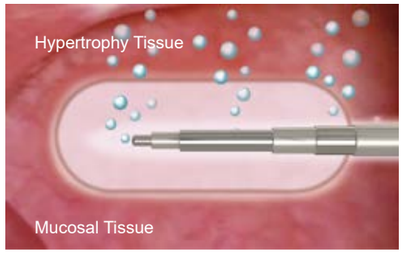
Plasma Surgical System VS Electrosurgical System

| Plasma Surgical System | Cutting by Laser |
|---|---|
| Tissue Decomposition | Cells Evaporation |
| 40-70˚C | 300-600˚C |
| Less Thermal Damage | More Thermal Damage |
| Light Patient Pain | More Patient Pain |

Plasma Surgical System VS Laser

## Advanced Surgical Method

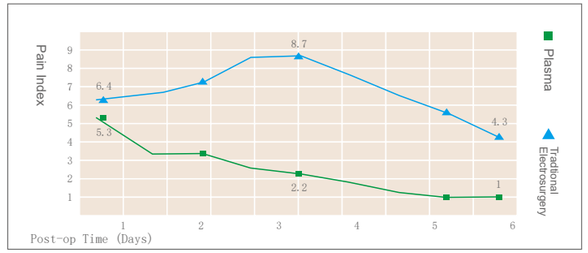
Different from the traditional method, it only uses one single plasma electrode to complete the surgical process.




## Reduced Patient Pain

Compared to that by conventional method of microwave or laser, the patient pain by plasma technology is reduced significantly. Normally the patient can resume oral intake in the same day after procedure.

Pain Study（P<0.001）





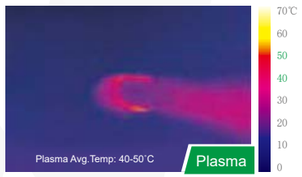

## Less Blood Loss

Excellent coagulation and hemostasis effect, even no blood loss in certain surgical process. Coagulation energy is adjustable. The blood loss of tonsillectomy by plasma technology can be controlled below 2ml while by traditional surgery the blood loss can reach 100ml.

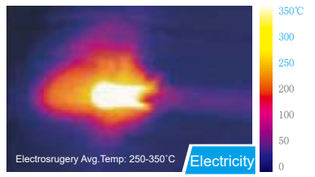

Comparision of Plasma System and Traditional Electrosugery System in Tonsillectomy

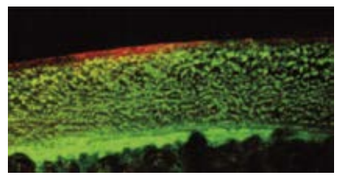
## Low Working Temperature Less Thermal Damage

Based on integrated capabilities, saline flow control system and the temperature control technology of generator, the working temperature at the electrode tip can be controlled at 40-70˚C, and energy penetration controlled within 100 microns.




Infraded image of Plasma & Electricity

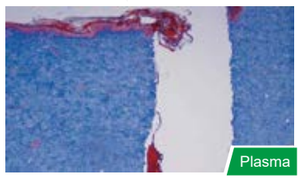


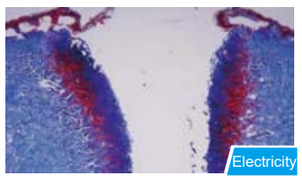



Less Thermal Damage By Plasma

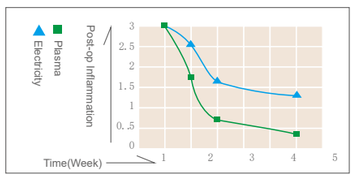
## Reduced Thermal Damage Fast Recovery

Reduced thermal damage to deep and healthy tissues, with fast post-operative recovery.




Comparision of Thermal Damage Between Plasma & Electricity




Comparision of Post-op Inflammation Degree By Plasma & Electricity



## Shortened Hospital Stay Time

The hospital stay for patients treated by plasma technology can be shortened by 2-4 days, compared to that by conventional surgical methods .