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Principles Of Bipolar Tissue Management

Balancing: the Art, Science, & Business of Dentistry

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Bipolar Neurosurgical electrosurgical systems and accompanying instruments are used in more than 90% of the neurosurgical operating rooms throughout the world. The Bident Bipolar Surgical System is the result of over twenty years of experience and development in the fields of neurosurgery and microsurgery.

BIDENT TECHNOLOGY

The Bident System has taken the development of the Malis neurosurgical Bipolar Surgical System and applied it to surgical field of dentistry. This breakthrough design has allowed the dental practitioner to cut and coagulate tissue with precision and safety not previously available from any other device, either electrosurgical or laser.



By using bipolar technology, procedures are done without the use of return or grounding pads. Bident is using a different electrosurgical concept, therefore there is no heat or current spread to adjacent areas. With no heat or current, the dentist can operate without the worry of touching a post, implant, bone, metal filling or metal crown.

The Bident Bipolar Surgical System has been designed to work in dry, bloody or irrigated fields. The Bident System truly presents a quantum leap in technology and safety over the monopolar devices currently in use today.

The important questions to be answered are:

- 1) *How does this unique device differ from all other electrosurgical generators?*
- 2) *Why is this new development important in the field of dentistry?*

The Bident Bipolar System introduces a new modality to tissue management for dentistry: bipolar cutting. The bipolar cutting system operates in quite a different manner from the familiar monopolar cutting of the present electrosurgical machines.

MONOPOLAR REVIEW

In monopolar cutting the power is presented to a fine tipped active electrode at a very high voltage with the return going through the patient to a proportionately large "indifferent" or "ground" plate. For this reason, the monopolar devices cannot work in wet or bloody fields, and may not ever be allowed to touch bone, tooth or metal. Customarily, for the fastest monopolar cutting, the power is turned on before the electrode contacts the tissue. A spark then jumps to the tissue as the electrode approaches, the impedance remains high, and the tissue is vaporized just prior to the contact of the electrode.

Monopolar voltages of well over 2500 volts are applied at the electrode with powers of several hundred watts or more available. Typically, monopolar devices cut with a 3 to 4 megahertz sine wave. This frequency has been shown to produce excessive surface spread of current and heat. Even with the power levels turned down, the initial voltage is still very high. The high initial voltage causes the energy to be shunted down through the tissue, as the tissue is touched. A considerable total current is distributed roughly in a geometric cone from the active electrode to the ground plate to the adjacent tissues. The

most conductive path to the ground has the highest current density. This, of course, means the current flow passes through main trunks of blood vessels and also through neural structures as well as muscle and bone. There is a considerable amount of current and heat at distances of even 1 to 2 cm from even a small point of tissue contact. For this reason the conventional use of monopolar coagulation is restricted, particularly for work around fillings, crowns or implants.

BIDENT BIPOLAR SURGERY SYSTEM

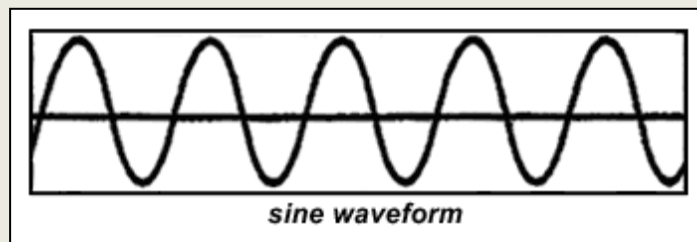
The Bident is a true bipolar system, designed on the basis of the Malis neurosurgical bipolar cutting and coagulation system. The system uses a 1 megahertz waveform for cutting and coagulation, which is further explained below. No grounding pad is necessary with any of the Bident cutting and coagulating instruments. The energy at the tips is totally isolated, and all the current passes only between the two tips of the instruments, eliminating current and heat spread to adjacent areas. The Bident system operates at under 140 volts as compared to the monopolar systems, at more than 2500 volts. The low voltage and extremely low impedance of this generator minimizes the voltage drop from open circuit to full load.

The Bident system employs two different waveforms specifically programmed for the smoothest cutting and coagulation, with the least charring and sticking. Both waveforms are tightly controlled, computer generated waveforms that are programmed specifically for the separate applications of cutting and coagulation. Unlike monopolar generators, which are ineffective when used with irrigation, the Bident gives the dentist smooth gentle coagulation and cutting in wet fields as well as dry.

The Bident system may be used to cut and coagulate with total safety in all tissues as well as directly on bone, around crowns, fillings and metallic implants without the risk of tissue necrosis.

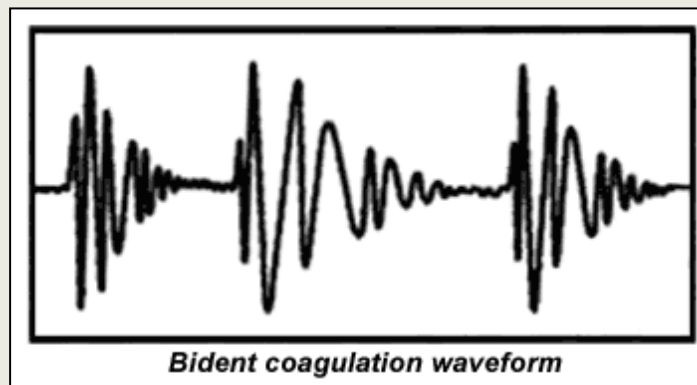
Bident Cutting

The cutting waveform works by dividing tissue through true molecular resonance, eliminating heat and sparking, as well as peripheral tissue damage caused by current spread across the surface. The resonance is created by keeping the waveform exactly rhythmic. Surgical research confirms that the optimal frequency for cutting tissue is 1 megahertz, as lower frequencies produced undesirable stimulation and higher frequencies caused significant heat and current spread. The Bident cutting sine wave is pictured below.



Bident Coagulation

The Bident coagulation waveform is patented, and is the exact opposite of the cutting waveform. The waveform is varied, and completely random, to eliminate molecular resonance, making it impossible to cut during coagulation. This is considered this gold standard in neurosurgery, because of the safety in using it in the brain and spine. Pictured below is the Bident coagulating waveform.



ADVANTAGES OF BIPOLAR TISSUE MANAGEMENT

- Permits hemorrhage control.
- Can operate on patients with pacemakers, defibrillators.
- Permits planing of soft tissue, a procedure unique to Bipolar Electrosurgery.
- Provides a clear and improved view of the operative site.
- Increases operative efficiency.
- Reduces chair time for each operation.
- Reduces the fatigue and frustrations of the operator.
- Gentle, clean coagulation which can never cut, for hemorrhage control.
- Designed specifically for dental and oral maxillofacial procedures.
- Cuts and coagulates in irrigated, bloody or dry fields.
- No grounding pads are needed. The patient is never in the circuit.
- Precise control of power settings.
- No tissue charring and shrinkage.
- Separate cutting and coagulation controls permits individual power output adjustments.
- Patented microprocessor controlled circuitry and waveforms.
- Low Impedance output gives the practitioner precise control at the operative site.
This means: no matter what the resistance of the tissue is or whether it is dry or wet the voltage will be constant.
- Designed for maximum safety and effectiveness
- Cuts and coagulates at wattages less than one quarter than that required for monopolar electrosurgery.
- Eliminates heat and current spread with full tactile feedback,
- More effective, more precise, safer and much less expensive than laser equipment

PROCEDURES OF BIPOLAR TISSUE MANAGEMENT

- Troughing for crown and bridge impressions.
- Elongation of clinical crowns for operative dentistry, endodontic treatment, orthodontia treatment, partial denture abutments, or crown and bridge abutments.
- Removal of tissue; exposing subgingival decay.
- Removal of hypertrophied tissue or scar tissue (epulis fissuratum, papillomatosis).
- Gingivectomies.
- Gingivoplasties.
- Frenectomies.
- Gingival curettage.
- Mucogingival or osseous surgery.
- Periodontal flap surgery.
- Operculectomies.
- Incision and drainage of abscesses.
- Incisional and excisional biopsies.
- Pulpotomies.
- Coagulation of soft tissue; bleeding problems.

Postoperative Care Following Bipolar Electrosurgery

Gentle Gel... New All-Natural Gentle Gel with Tea Tree Oil is the perfect post-op balm for all dental procedures. It soothes and desensitizes the affected area and helps promote healing. Apply Gentle Gel to the operative site, and then give the tube to your patient to take home. (Gentle Gel is also effective for canker sores, cheek bites, xerostomia and other oral irritations.)

Frequently Asked Questions

What procedures are done using Bipolar tissue management?

You can perform the entire gamut of surgical procedures with the Bident System.

How do I clean tissue from hand pieces?

With cut pedal depressed use a wet 2x2 to pull tissue from the electrode.

Why are there 2 electrodes?

All power flows between the 2 electrodes in the hand piece. No grounding pad or is ever used and the patient is not in the circuit.

Which electrode does the work?

*When using the 33 series (pens) the 2nd electrode to touch tissue is the cutter.
When using the 32 series (loops) the cutting is done by the inside loop.*

Are hand pieces flexible?

The 32 series (pens) are flexible; hold the first joint and bend above it.

How do I know where to set the L.E.D. bar?

Begin at a setting of 4 (approximate 20 watts).

How much pressure should I exert when using the Bident Tissue Management unit?

Use NO pressure at all. As if you were a delicate painter gently striking backward or forward. Since current is not passing from the tip through the body and back again, no pressure is needed.

How can I tell when I am using too much pressure?

The electrodes will touch each other and no current will flow.

What is the best way to control the odor?

When used with irrigation and suction there will be no odor.

Is there heat spreading or tissue charring?

No, both technology was developed for use in brain surgery, where charring, heat spread, current spread can not be tolerated.

Are the accessories autoclavable?

No, they are designed as disposables.

Which hand pieces come with the system?

*3301- anterior troughing or surgical Incisions
3302 - cutting or shaving lingual surface
3304 - posterior troughing on buckle or lingual
3306 - troughing or cutting the mazel or distal
3102 - coagulating ball - also used to erase tissue tags
3202 - gingivoplasty loop*

Will I be able to see in a bloody field?

Since Bident cuts and coagulates at the same time, this is never an issue.

What can Gentle Gel be used for?

"Gentle Gel" is a soothing agent. It is excellent for any surgical site, teething babies, pizza burns, aggravated tissue from braces or any irritated tissue.

Can I send out for a biopsy the tissues I have harvested with the cutting loops and still expect accurate results?

Yes. Because our unit produces virtually no peripheral heat or current spread there is no damage to the tissue being harvested. This allows the lab to obtain an accurate biopsy reading. This same technology also allows for graft site harvesting, while maintaining the viability of the tissue. THIS COULD NEVER HAVE BEEN DONE WITH A MONOPOLAR ELECTROSURGICAL UNIT.

Can I work around implants or crown and bridge units?

Yes. With the BIDENT Bipolar Tissue Management System you can safely work around metal implants, or crown and bridge work. You are also able to directly work on or around bone without the fear of necrosis. This again relates to the lack of heat or current spread with this unit.

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