OCULAR SURGERY NEWS®

The world's leading medical newspaper for ophthalmologists

Vol. 17, No. 3 • February 1, 1999

Radiosurgery is an effective and efficient technique for cosmetic eyelid surgery

This procedure combines cutting and hemostatic modalities with minimal lateral heat spread or adjacent tissue destruction.

by Chedly Bouzouaya, MD
Special to OCULAR SURGERY NEWS

Blepharoplasties for the upper or the lower lid performed using a scalpel or scissors always have required additional surgical maneuvers and instrumentation to obtain hemostasis. Recently, there has been interest in the use of various types of lasers to incise eyelid tissues, since it is generally believed that lasers can incise tissue with less tissue damage than that which occurs with electrocautery.

Traditional electrocautery has a platinum wire that is heated to red heat with electric current, which can cause considerable tissue damage. Laser, as well, is not without its potential for tissue destruction due to increased lateral heat. However, radiosurgery is the utilization of a high frequency radio signal to incise, excise, ablate or coagulate tissue with minimal tissue alteration. Soft tissue resistance to these radio waves causes the water cells to heat, resulting in cellular molecular dissolution.

The radio waves leave the Surgitron FFPF (Ellman International Inc., Hewlett, N.Y.) at a frequency of 3.8 MHz above AM and below FM frequencies through a handpiece. A fine wire electrode is used to make the skin incision, as well as orbicularis muscle and orbital fat resection. The incision is pressureless, smooth and bloodless with minimal to no lateral heat spread.

High frequency waves in the surgical procedure have been investigated for decades showing that 3.8 MHz is the frequency for cutting soft tissue, and that a fully filtered wave produced a minimal tissue alteration.

The Ellman Surgitron has the capacity to deliver a variety of waveforms: filtered, pure cutting; partially rectified, hemostatic; and fully rectified, cutting with hemostasis.

Upper lid blepharoplasty. Quick, smooth strokes are used to make an exact skin incision.

Upper lid blepharoplasty: skin excision with Varitip electrode.

Upper lid blepharoplasty: fat resection.

Transconjunctival blepharoplasty. 2 to 3 conjunctival fornix buttonhole incisions are made.

Transconjunctival blepharoplasty.

Transconjunctival blepharoplasty.

Photograph of a patient before lower lid transconjunctival blepharoplasty.

The same patient after lower lid transconjunctival blepharoplasty.

Material and method

The Surgitron FFPF unit with footswitch assembly and Surgitron handpiece H3 was used for all blepharoplasties. (The Surgitron IEC model is now used in the hospital setting.) A Varitip electrode (A8) was used for the upper lid blepharoplasties to cut skin, muscle and septum and to resect the pre-aponeurotic fat. The unit is set on a fully rectified current, the power setting is set at 2 and is increased by increments of 0.5 until a smooth cut without tissue drag is achieved.

Quick, light, smooth strokes are utilized to make a fine, exact skin incision without charring, with minimal lateral heat spread or collateral tissue damage. Likewise, a myocutaneous flap, an orbicularis muscle resection, a septal incision and a fatty resection are performed.

Hemostasis is easily obtained by grasping the bleeding tissue with a fine forceps and touching it with the wire electrode. There is a ball tip electrode (D series) that can be used as an alternative, setting the Surgitron unit on partially rectified, completely hemostatic mode.

For the lower lid blepharoplasties, I used the same setting. A Varitip electrode was used for the external approach, and the A3 electrode for the transconjunctival approach. Most of the lower lid blepharoplasties were done through a transconjunctival approach. The traditional transcutaneous lower lid blepharoplasty has significant complications.

My transconjunctival approach consists of making two to three conjunctival fornix buttonhole incisions. The orbital fat is teased out and is easily resected using the same electrode. Bleeding is nicely controlled without changing instruments by simply grasping the bleeding tissue and touching it with the electrode. With this well-controlled hemostasis, I did not find any need in clamping the fat with a hemostat across its base before resecting it and cauterizing the fat stump as is done traditionally.

Radiosurgery

Radiosurgery was used for all of the blepharoplasty procedures. There is no absolute contraindication to its use, although the unit should not be used on patients with a pacemaker. A corneal protector should be used, as it is easy to go directly through the lid when learning to use the unit. Surgeons need to get accustomed to the lighter feel, as the electrode requires a light tissue contact.

The instrument provides excellent hemostasis if it is used properly. The Varitip electrode is my favorite tip, and I can get absolute hemostasis when I need it. I can grasp the bleeder with the forceps and touch it with the fine electrode without changing instruments and current settings.

The unit produces a filtered waveform, a fully rectified waveform or a partially rectified waveform. The filtered waveform provides 90% cut and 10% hemostasis. The fully rectified waveform is recommended for blended cutting and hemostasis (50% to 50%) and the partially rectified waveform is recommended for pure hemostasis. An antenna plate focuses the waves to make its action more efficient.

The microsharp cut with good hemostasis and minimal charring allows for minimal pain and swelling postoperatively. Fast healing without prolonged erythema and with no predisposition toward wound dehiscence as seen post-CO_2 laser.

The advantages of radiosurgery are numerous. There is minimal lateral heat spread, the intracellular water heat and the cells volatize only at the point of contact with the transmitting electrode. Thus, there is no damage to the adjacent cell layers, unlike electrocautery, which produces a larger area of tissue damage. The radio frequency causes minimal postoperative pain or edema and no observed increase in inflammation or infection. ■