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# RADIO FREQUENCY MODULATION SURGERY AS A SURGERY ADJUNCT TO THE RESECTION OF LUMBOSACRAL LIPOMA DETETHERING OF THE SPINAL CORD

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Radio Frequency Modulated Surgery (RFMS) was first introduced in 1970 and functions in the upper range of the radio wave spectrum. It also utilizes various waveform oscillation modifications to both refine and change the properties of the energy being emitted. The result is a radio wave transmitting electrode that can directly project energy to the immediate surrounding tissues. The effect generated is dependent on the waveform, duration, power setting and surface area of the electrode. The active electrode does not heat up, unlike electrocautery or laser, and there is minimal to no heat generated to the surgical site. This allows the surgeon to work in direct proximity to the functional neural elements which he is attempting to preserve. 30 patients with lumbosacral lipomas with intradural extension and tethering of the spinal cord were targeted for lipoma resection and detethering. In each case, RFMS was employed as a surgical adjunct during the procedure. In all patients, a gross or total or radical resection of intradural lipoma in addition to detethering of the spinal cord was achieved without complication. RFMS was felt to significantly facilitate many aspects of the procedure and represent an exciting new surgical adjunct. The utilization of RFMS may thereby empower the surgeon to accomplish a far greater resection of the intradural lipoma without damaging the involved adjacent spinal cord and nerve roots. The report will focus on the author's application of RFMS as well as its potential benefits for this complex procedure in which complications must be minimized.

The Long Island Campus for the
Albert Einstein College of Medicine


Long Island Jewish
Medical Center

July 25, 2001

Dr. Jon Garito
Ellman International
1135 Railroad Avenue
Hewlett, NY 11557

Dear Jon:

I would like to update you on our continuing progress and development regarding the Ellman IEC in Neurosurgery. As we continue to find new uses both intracranial and intraspinal, we decided to quantify the extent of lateral heat spread in neural tissue. We have recently completed a two-phase study that is pending publication in this regard.

In the first phase, we measured heat spread in *in vivo* brain tissue. We were able to make several small incisions on brain cortex with the Vari-tip electrode on a filtered setting. The brain sample was immediately excised as part of a temporal lobectomy. The incisions were examined under the microscope by a neuropathologist for analysis of lateral heat spread. The range of tissue alteration ranged from 10 to 20 microns. This represents a significant reduction in damage in comparison to that of laser and Electrosurgery (300 – 500 kHz) studies performed on other human tissue.

The second phase of our study directly compared our preliminary results to the effects of laser and electrocautery on *in vivo* human neural tissue. In a similar procedure, we made incisions with a CO2 laser and conventional electrosurgery unit. The heat damage of these modalities was consistent with that of other types of human tissue. Heat alteration ranged from 300 microns to several millimeters.

These studies have confirmed our belief that your unit is the most effective modality for minimization of tissue damage. The Ellman IEC with its 4.0 MHz frequency has proved to be the preferred surgical instrument, in our department, for delicate work in direct proximity to important neural structures. Our continued work with spinal cord detethering to date has produced excellent results. Other protocols involving mass lesions excision and cyst fenestrations are encouraging and will be completed shortly.

Please do not hesitate to contact me regarding any questions or further detail regarding the aforementioned.

Sincerely,

Dr. Anders Cohen
Dept. of Neurosurgery
Long Island Jewish – North Shore University Hospital