MEDCO FORUM®
PRESENTING INNOVATIVE PRODUCTS AND SERVICES TO HEALTHCARE PROFESSIONALS
VOLUME 19 NUMBER 9
MARCH 2012
REPRINT

MISONIX BONESCALPEL™ BECOMING A PREFERRED SURGICAL TOOL

Ultrasonic Osteotome Precisely Cuts Bone With Minimal Trauma To Soft Tissue

Combining very fine, precise cutting with a soft tissue sparing capability, the ultrasonic BoneScalpel™ (Misonix, Inc., Farmingdale, N.Y.) lends itself to bone dissections in spinal applications, in particular for decompression procedures such as laminectomy, when the underlying dura is at risk. Its longitudinal blade motion enables precision osteotomies free of gyroscopic effects and facilitates cutting techniques for en-bloc bone dissection and in close proximity to delicate soft tissues. A patented liquid pathway directs the irrigation fluid to the blade-tissue interface, compensating for thermal effects, and facilitating safe, clean and non-necrotic bone dissection.

Precise enough it can cut a window in a raw egg yet leave the membrane intact, the Misonix BoneScalpel has been hailed by surgeons as one of the most important advancements in spine surgery during the last few years and is predicted to become a preferred surgical tool for the next decade and beyond.

What Surgeons Are Saying

"I actually heard about the Misonix BoneScalpel for the first time while in Europe recently," comments Edgar N. Weaver, Jr., M.D., FACS, of Weaver Neurosurgical Spine, P.C. in Roanoke, Va., who has more than 30 years of experience in the surgical and non-surgical care of spinal disorders. "I came back and used it as a trial all through January 2012, and now I use it almost exclusively for removing bone. I do not use the drill anymore. The BoneScalpel has more precision and more control, and it is a real improvement in terms of removing bone around delicate structures."

BoneScalpel – Ultrasonic Console

Dr. Nicholas Qandah, a neurosurgeon at Carilion Clinic, a not-for-profit healthcare organization serving nearly 1 million people in Virginia through hospitals, outpatient specialty centers and advanced primary care practices, states: "In my experience with deformity and tumor surgery, I have found significant advantages using the BoneScalpel for corpectomies. Previously, I have had to use a mallet to strike the osteotome into the bone, an aggressive move, but with the BoneScapel's ultrasonic oscillation, I make similar cuts and remove bone in fragments, with less trauma or risk to the patient."

"The BoneScalpel is a powerful addition to our armamentarium of bone removal devices," asserts Dr. Nicholas Theodore of Barrow Neurosurgical Associates, Ltd., headquartered in Phoenix. A neurosurgeon whose subspecialties include neurological trauma surgery, complex spinal surgery and peripheral nerve surgery, Dr. Theodore recently received a highly prestigious NIH RO-1 grant, less than 10 percent of which are funded nationally, to study spinal injuries and novel approaches to spinal surgery. He has been using the BoneScalpel for more than

a year and says that the instrument "allows us to make very precise cuts adjacent to critical structures, such as the spinal cord."

Isador H Lieberman, M.D., MBA, FRCSC and orthopedic surgeon at the Scoliosis & Spine Tumor Center, Texas Back Institute and Texas Health Presbyterian Hospital in Plano, reports, "The BoneScalpel is a safe and effective bone cutting device that can be used to facilitate osteotomies in a variety of spine surgeries. This device may obviate the need for and risk of high speed burrs and oscillating saws during spine surgery. It's a very versatile and safe device, with multiple applications to carve and craft bone."

Advantages: Safety and Control

The Misonix BoneScalpel provides precise cuts through osseous structures with minimal loss of viable bone and minimal trauma to adjacent soft tissues. This new ultrasonic surgical device combines important safety and control aspects associated with hand instruments, such as Kerrisson punches and Leksell Rongeurs, with the convenience and ease of powered instruments, such as drills, burrs and saws. Its handpiece uses an electrical signal of 22.5 kHz from its ultrasonic console. A piezoelectric transducer converts the input signal into mechanical vibrations at the same ultrasonic frequency that are further amplified in order to achieve efficient cutting characteristics. The blunt blade oscillates in a linear, piston-like motion, enabling an effortless dissection of hard, cortical bone.

"The BoneScalpel doesn't spin and doesn't perceptibly oscillate, but creates very fine, clean cuts in the bone without all the pounding from a mallet and without the risk of a burr spinning and catching soft tissue. It gives you the precision and efficiency with much less risk," states Dr. Lieberman.

When rigid bone comes in contact with the BoneScalpel blade it does not deform or move away. As a result, the bone absorbs a large portion of the energy and the recurring impacts at 22,500 times per second diminish the bone's integrity, allowing for a controlled, dissecting split. In contrast, soft tissue responds elastically to contact with the impacting blade; it moves, deforms and vibrates. Tissue response to the ultrasound action differs by tissue density, collagen content, blade pressure and length of exposure.

Rapid, Safe, Precise, and Hemostatic Osteotomies

The BoneScalpel's resulting osteotomy is very precise and its kerf can be as thin as 0.5 mm and up to 20 mm deep into the bone without any visible bone dust that is typical for rotary sharps. Loss of viable bone is thus minimal and coagulative effects contribute to minimal bleeding and a cleaner surgical site.

According to Dr. Theodore, "One nice aspect of the BoneScapel is that as it cuts, it has a hemostatic effect. I am impressed by the fact that when we are doing a cervical, lumbar or thoracic surgery and are taking bone away, the blood loss is much less than it would be without the instrument."

Dr. Lieberman notes that, "Using the BoneScalpel, I am now able to complete bilateral facetectomies from T2/3 to T11/12 in less than 15 minutes," and Dr. Weaver agrees that "The BoneScalpel makes it considerably faster to remove the lamina and saves maybe 40 percent of the time to do a total laminectomy. I use the blade for complete laminectomies and switch mostly to the shaver around nerve roots."

Tumor Resections

"I recently used the BoneScalpel to remove a metastatic lesion of the thoracic spine," says Dr. Qandah. "There is little room for error in the thoracic spine in terms of drilling, but the BoneScalpel replaces the drill. In this case, the bone was eaten away by the tumor itself, but I was able to thin down the bone without putting any pressure on the spinal cord, and without much debris or bleeding."

Dr. Theodore, who handles everything in the spine from congenital developmental problems in children, to disorders of the aging population, to trauma and infection, states that he has used the BoneScalpel in several bone tumor surgeries. "Once we define the anatomy, the BoneScalpel helps us to minimize blood loss when cutting through bone. Tumors tend to be very vascular, and the instrument helps us to remove that tissue in a less bloody fashion." He comments that he also appreciates the safety profile of the tip.

Most of the BoneScalpel's blade designs are universal and for multifunctional surgical use, with a choice of cutting directions. Cutting and shaving tips are available with extended reach for approaches to deep body cavities or applications in microscopic and minimally invasive spine surgery.

For more information about the Misonix BoneScalpel™ please call Misonix Customer Service at 1-800-694-9612, email sales@misonix.com, visit our website at www.misonix.com.