Dr. Sandeep Bagla Explains Why OsteoCool Is So Cool



Back in January, Medtronic launched the OsteoCool™ RF Ablation system for surgeons who treat patients with painful spinal metastases. The innovative system offers cooled radiofrequency (RF) ablation technology with simultaneous, dual-probe capabilities, providing both procedural flexibility and predictable, customized treatment. Cooled RF ablation basically uses targeted heat energy to destroy cancer cells.

Among OsteoCool's biggest proponents is Dr. Sandeep Bagla, an interventional radiologist with the Vascular Institute of Virginia. In a recent interview, he stated, "The OC system provides incredible flexibility in treating metastatic malignancies of the spine by allowing for treatment of a wide variety of lesions. Each patient has unique anatomy, and the metastatic lesions may have different shapes and configurations. The OC system allows for treatment of almost any shaped tumor within the vertebral body, using tools for planning and ablation zone mapping in combination with two simultaneous water cooled ablation probes to treat the vertebral body tumor."

He continued, "Each cancer subtype -- i.e. breast, lung, colon -- may also have different tissue characteristics, and this may alter the effectiveness of the ablation. The water cooled system combined with an algorithm that allows for a slow ramp-up of temperature allows the system to deliver controlled heating, which reduces potential char in adjacent tissue. This provides flexibility in treating differing tumor types, as well."

Bagla recently presented the pre-clinical animal lab data from an OsteoCool study at the Cardiovascular and Interventional Radiological Society of Europe's (CIRSE's) 2016 event in September. He recalled, "This entailed performing OC ablation in-vivo and comparing the in-vivo effectiveness with ex-vivo experience. This is incredibly valuable as there is limited experience performing bone ablation in a live setting. After performing the ablations in this porcine model, we evaluated the effectiveness of our ablation with MRI imaging immediately post ablation and then delayed at seven days."

Bagla added, "We also evaluated the ablation zones for histopathological evidence for cell death. What we found was a reproducible ablation volume that matched ex-vivo planning, and also a strong correlation between MRI imaging and histopathological evidence for cell death. This study has many implications including the high accuracy of the OC system for single-probe ablations and the correlation between MRI imaging and pathology."

Dr. Matthew Callstrom, PhD., abstract co-author and a professor of radiology at the Mayo Clinic College of Medicine in Minnesota, remarked, "The study found excellent correlation of the expected outcome with the MR imaging data, which will provide confidence for the use of this system in patients."

The OsteoCool RF Ablation System is intended for palliative treatment in spinal procedures by ablation of metastatic malignant lesions in a vertebral body. The OsteoCool RF Ablation Probe utilizes a coaxial, bipolar technology that delivers localized tumor ablation. It also automatically moderates power to keep RF heating within the desired treatment range, reducing potential thermal damage to adjacent tissue.

Bagla says among the design features of OsteoCool that he finds most relevant is "the ability to map out your ablation and predict the anterior and posterior margins of the ablation under fluoroscopy before the treatment is vital. This ensures safety in a critical area. Simultaneous bilateral ablation and its synergistic effects is another key design feature. This allows for treatment of the posterior central aspect of the vertebral body, which is an area that is most difficult to cover with radiation, surgery, and competing technologies." The OsteoCool Ablation System is intended for

palliative treatment in spinal procedures by ablation of metastatic malignant lesions in a vertebral body. It is contraindicated in patients with heart pacemakers or other electronic device implants and for use in vertebral body levels C1-C7.

Medtronic co-developed the OsteoCool technology with and acquired associated intellectual property from Baylis Medical in December 2015 for an undisclosed sum. It has since partnered with the company to further innovate the system. The system's 17-gauge, bipolar probes are available in a trio of lengths and may be used through a variety of cannula sizes. Because two OsteoCool RF ablation probes can be used at the same time, the system is well-positioned to support a variety of ablation scenarios accommodating unique patient and procedural needs.

Any doctor using this equipment definitely has to be familiar with image-guided spine procedures. But what else does he/she have to be well-versed on in order for this to be effective? Bagla replied, "The physician performing spine intervention with OsteoCool should have a solid understanding of the clinical decision making that goes in to treating a patient with different types of metastatic cancer. They should also understand the role of radiation or surgery, and what the benefits and pitfalls of each therapy are."

Bagla is extremely well-qualified to understand and comment on OsteoCool. A board certified interventional radiologist, he completed his residency in Diagnostic Radiology at Albany Medical Center in New York where he also served as Chief Resident. Bagla is board certified in Diagnostic Radiology with a Certificate of Added Qualification in Interventional Radiology. His research interests have ranged from Soft Tissue Tumor Ablation to Prostate Artery Embolization in the Treatment of Benign Prostate Hypertrophy.

In his view, the OsteoCool system is exciting for a number of reasons. "First," he states, "is the ability to treat difficult to cover lesions with a reproducible bilateral ablation approach using the system's built in algorithm. I am also excited for the future, as medical device companies such as Medtronic, strive to bring improved tools to the IR and Surgical communities. These devices will allow us to provide palliative care for patients with spinal metastases in a minimally invasive method."

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