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Cavity SpineWand® from ArthroCare® Corp.
Patented Coblation® Technology
Designed to create a cavity in a malignant lesion in the spine

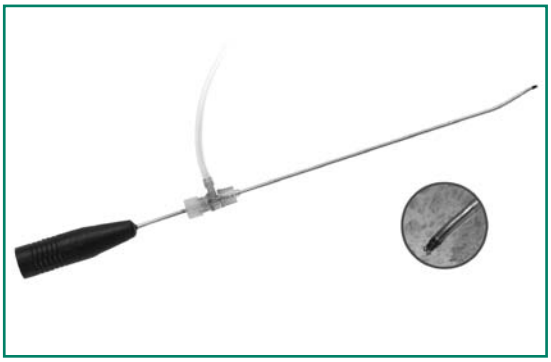
The Cavity **SpineWand®** from **ArthroCare® Corp. (Austin, TX)**, with its patented **Coblation®** technology, is designed to create a cavity in a malignant lesion in the spine. Coblation® is a low heat form of radio frequency. It uses electrical energy combined with a conductive medium, such as saline solution, to form plasma that gently and precisely dissolves soft tissue. As the Cavity SpineWand quickly and precisely removes malignant tissue, it creates a space inside the affected vertebral body. The highly controlled removal of tissue is done at relatively low temperatures (typically 40°C to 70°C). This technique has been used in more than 1,000 tumor treatment procedures.[1]

Peter C. Gerszten, MD, Associate Professor of Neurological Surgery at the University of Pittsburgh Medical Center (Pittsburgh, PA), believes that the Cavity SpineWand has opened the door to treatment for many patients with pathological compression fractures, previously not candidates for other procedures, such as open surgery, due to increased risk of surgical morbidity. "With the Cavity SpineWand, physicians can precisely remove a substantial volume of the tumor and create a cavity inside the affected vertebral body, which is often compromised."

This procedure differs from others such as kyphoplasty, which *displaces* rather than removes tumor tissue. According to Frank D. Vrionis, MD, PhD, Director of Spinal Oncology, H. Lee Moffitt Cancer Center (Tampa, FL), this can cause problems. "Most of these patients have a tumor disrupting the posterior cortex of the vertebral body that brings it very close to the nerves and spinal cord. With the Cavity SpineWand, you can eliminate a substantial part of the tumor by essentially resecting it—all through a 5mm stab incision in the vertebral body." Dr. Vrionis has performed this procedure on approximately a dozen patients with metastatic spine tumors and his results have been good to excellent, and he has experienced no complications from the procedure.

"For a long time, all we really had to offer people with metastatic disease in their spine and symptomatic cord compression was external beam radiation to shrink the size of the mass to try to decrease the mass effect against the spinal cord," points out Thomas P. Murphy, MD, an Interventional Radiologist with Quantum Radiology, WellStar Health System (Marietta, GA). "We could help the spinal symptoms, but couldn't do anything for the pathological fracture. This technology allows very safe, controlled ablation of a portion of the tumor that is in the deep, bony part of the spine."

"When you have patients with metastatic disease, it's all about performance status. We want our patients to live as normal a life as possible," Murphy said.



The Cavity SpineWand surgical device has been used in over 1000 procedures and more than 250 doctors throughout the U.S. have been trained on the technology.

For more information about the Cavity SpineWand, please call 1-877-620-BACK (2225), or visit www.arthrocarespine.com.

Reference:

1. (Oakland RJ)The biomechanics of vertebroplasty in multiple myeloma and metastatic bladder cancer: a preliminary cadaveric investigation. J Neurosurg Spine 9:493-501, 2008.

Percutaneous Cement Augmentation

Utilizing Parallax Acrylic Resin to Fill a Void Created in a Vertebral Body

Vertebral compression fractures caused by spinal metastases can be quite debilitating. Treatments are aimed at reducing pain and preserving or restoring function.[1] Traditional percutaneous bone cement augmentation (e.g. vertebroplasty) to treat malignant vertebral body fractures, particularly those showing posterior cortical defect and epidural extension, however, is more challenging than treating patients with benign osteoporotic fractures due to the higher risks of complications.[2,3]

Cavity Creation

Thus, creating a cavity in the tumor tissue may have significant advantages over other traditional techniques because the cement can be safely placed, directed away from the posterior portion of the vertebral body, allowing physicians to perform the augmentation procedure in a much safer way. According to Peter C. Gerszten, MD, Associate Professor of Neurological Surgery at the University of Pittsburgh Medical Center (Pittsburgh, PA), by first creating a void into which you can inject the cement for percutaneous augmentation, you will be able to more evenly fill the entire vertebral body. "More of the cement may be able reach the cortical surface, thereby increasing biomechanical stability. This should help decrease the patient's pain and also improve the safety profile of the procedure because you are substantially decreasing the possibility of cement extravasation and anterior corpectomy."

> *"If we can decrease a patient's pain scores from a 7 out of 10 to a 3 out of 10, that's a win."*
>
> **- Thomas P. Murphy, MD**

Cement Properties

The Parallax acrylic resin is a PMMA-based (Polymethyl methacrylate) product which has been used over the past eight years to treat vertebral compression fractures due to trauma, osteoporosis, or tumor. The patented formulas preserve mechanical properties, prevent inconsistencies, and reduce unnecessary steps in the procedure room. Thomas P. Murphy, MD, an Interventional Radiologist with Quantum Radiology, WellStar Health System (Marietta, GA), finds that, "Compared to other cements, the viscosity of the Parallax acrylic bone cement allows easy, controlled delivery that does not generate a great deal of heat. In the past, PMMA cements have been quite exothermic, which becomes a concern when used near the spinal cord." Dr. Murphy also finds that the Parallax formula, which includes the tannulum and barium sulfate opacifier, helps him visualize and more easily gauge the flow rate of bone cement into the vertebral body.

How it Works

Cement is used to fill in the space after a void has been created in a vertebral body. The cement is mixed according to instructions and poured into the delivery system, and it is then injected into the vertebral body under fluoroscopic guidance using low pressure, which theoretically reduces the risk of extravasation.[4] The Parallax bone cement is optimized for use with the Parallax EzFlow® or IDS (enclosed) delivery systems. Both systems feature a colored injector barrel that allows for accurate visualization of the cement, and the 17" extension tube with a 90º bend to minimize radiation exposure.

Outcomes

Dr. Murphy receives many referrals for percutaneous cement augmentation in patients with metastatic disease and has been pleased with his overall success rates for pain reduction. "By creating the cavity in the tumor tissue and then back-filling the cavity with bone cement, we can create better biomechanical stability. In this way, we can decrease a patient's pain without undue pressure from other systems, such as balloon kyphoplasty, which have a higher risk factor for procedural complications in this patient population."

Dr. Murphy adds, "If we can decrease a patient's pain scores from a 7 out of 10 to a 3 out of 10, that's a win."

References:

1. Gregory, BA, Metastatic Spinal Lesions: State-of-the-Art Treatment Options and Future Trends. *American Journal of Neuroradiology* 29:1605-1611, October 2008.
2. Georgy, BA, Wong, W. Plasma-Mediated Radiofrequency Ablation Assisted Percutaneous Cement Injection for Treating Advanced Malignant Vertebral Compression Fractures. *American Journal of Neuroradiology* 28:700-705, April 2007.
3. Chiras J, Depriester C, Weill A, et al. [Percutaneous vertebral surgery. Technics and indications]. *J Neuroradiol* 1997;24:45–59.
4. Fourney, DR, Schomer DF, Nader R, et al. Percutaneous vertebroplasty and kyphoplasty for painful vertebral body fractures in cancer pratients. *J Neurosurg Spine* 2003;98:21-30.