

No pain, no gain: Weight loss, disc disease interventional radiology treatments coming

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A minimally invasive treatment may target hunger at its source, another uses X-ray visible embolic beads to block arteries to the stomach and suppress hunger and a third explores the use of stem cells to repair vertebral disc degeneration. Initial results from all these studies were reported at the Society of Interventional Radiology's 37th Annual Scientific Meeting in San Francisco, Calif.

Approximately 127 million Americans (or 65 percent) are overweight, obese or morbidly obese, according to the [Centers for Disease Control and Prevention](#). The rate of morbid obesity is also rising rapidly. Two new studies that explored the use of proven interventional radiology treatments in new ways may have the potential to help individuals with [morbid obesity](#).

"Currently, there are three clinically viable surgical alternatives for obesity: gastric bypass surgery, gastric pacing and endoscopic gastric banding. These procedures have varying success rates; they are invasive, require extensive gastric/bowel reconstruction or external devices and can have significant surgical complications," explained Charles Y. Kim, M.D., assistant professor of radiology at Duke University Medical Center in Durham, N.C., and lead investigator on one of the studies.

"Our promising results led us to believe that a minimally invasive interventional radiology treatment—called bariatric arterial embolization—would allow for precise targeting of a specific portion of a person's stomach in order to decrease production of ghrelin, a hormone

that causes hunger. This treatment could one day be the answer for those who have not been successful with weight loss through diet and exercise," said Kim.

Embolization is a minimally invasive technique where an interventional radiologist uses a thin catheter to inject tiny particles into an artery supplying the area being treated with the goal of blocking tiny vessels to starve it of its blood supply.

"Interventional radiologists have safely and effectively used embolization in many other disease states for decades," stated Kim. "For this study, we selectively blocked and decreased the blood flow to a very specific part of the stomach using specialized radiologic equipment, which led to significantly decreased levels of ghrelin in the animals that we treated. We found that when ghrelin levels decrease, appetite and hunger also decrease, causing weight loss in the treated animals relative to non-treated animals," Kim continued. "Bariatric arterial embolization may have a future use in treating obesity in humans by significantly suppressing appetite to achieve weight loss," he said.

The researchers will continue studies aimed at the reduction and elimination of complications, such as stomach ulcers, and expressed confidence that bariatric arterial embolization is very close to moving toward the clinical trial phase in the United States.

A second study tested a new type of X-ray-visible embolic bead in bariatric arterial embolization.

"Until now, clinically available embolic beads have not been visible on X-ray during or after delivery. We developed a new embolic bead that can be seen directly by X-ray imaging and have tested them in the new bariatric embolization treatment for obesity," explained Clifford R. Weiss, M.D., assistant professor of radiology at Johns Hopkins

University, School of Medicine in Baltimore, Md.

"The current system requires that the beads be mixed with X-ray-visible contrast agents before delivery. Although this mixture is visible during infusion, the contrast immediately washes away, and the location of the beads can no longer be 'tracked,'" Weiss said. "By making the beads X-ray visible and using them in tandem with C-arm cone-beam CT—a new way of X-ray imaging that creates 3-D pictures—these beads can be tracked both during and after delivery. This allows for more precise assessment of 'on-target' embolization," he said. "Due to the fact that these beads are visible and can be tracked over time, we should be able to assess their long-term presence. If needed, the patient can then be retreated. With the current clinically available beads, it is not possible to determine whether they are intact and functional over time. We recommend further studies to prove the beads' safety over time and ensure they do not have any unintended effects on the target organs or on the individuals being treated," he added. "We believe there are myriad possible applications for these beads, such as treating cancer of the liver or non-cancerous uterine masses," stated Weiss.

In a third study, a research team showed in animals that [stem cells](#) can be injected using only a needle, under X-ray guidance, into degenerated, painful intervertebral discs and initiate their repair.

"Even though 80 percent of people will have painful degenerated discs by age 65 and degenerated intervertebral discs are a significant contributor to low back pain, effective therapies are lacking. The current treatment is surgical removal of these damaged discs, and this often requires more than one surgical procedure. Interventional radiologists acted on a need for a minimally [invasive treatment](#) that could mean faster recovery and less need for repeat surgeries in individuals suffering from debilitating disc disease," explained J. David Prologo, M.D., an interventional radiologist at University Hospitals Case Medical Center in

Cleveland, Ohio.

"Stem cell therapies are increasingly showing great promise for disc regeneration and biological repair and may represent a promising alternative to destroying the disc, replacement or immobilization," noted Prologo. "All adults have stem cells that can be isolated from their bone marrow, and we observed that repair could be achieved by injecting a person's own stem cells into the bad discs," said Prologo. "After attaching an imaging agent to the injected cells, we were able to prove accurate delivery and containment of those cells at the desired site of action. And, we are now performing the first in human trials of this technique," he added.

"The use of interventional radiology for the delivery of regenerative therapies, such as stem cells, can lead to other minimally invasive procedures associated with potential symptom relief and decreased cost and complications associated with open surgery," Prologo stated. "This research may serve as a precedent for a wide variety of stem cell applications in humans through interventional radiology," he said.

Provided by Society of Interventional Radiology

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