

Avoiding hip replacement: How stem cells can treat avascular necrosis

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Credit: Yale University

A Yale Medicine orthopedic surgeon has developed an innovative procedure that uses a patient's own stem cells to treat a condition that can cause painful hip fractures.

The condition, called avascular necrosis, is when the flow of blood to the bones is cut off or reduced. It can be caused by a trauma, such as a broken joint or certain kinds of cancer therapy; certain conditions, such

as [sickle cell disease](#); and/or fat deposits in blood vessels. Avascular necrosis can lead to fractures.

Daniel Wiznia, MD, the Yale surgeon who has developed this surgery, compares the fracture to a delicate dinner plate. "Over time, the glaze of a plate will form cracks. And eventually, it will break. Bones work in the same way. Our blood provides nourishment to our bones, so that the cells within them can repair those cracks," Dr. Wiznia explains. "But if the bones don't have that blood supply, they can't regenerate and fix the fractures."

And that's where stem cells come into play. Stem cells in our bone marrow can regenerate [new blood vessels](#), muscle, and bone. "Because we're able to replace injured bone with fresh bone, you may not need a more invasive procedure, such as a joint replacement," Dr. Wiznia says.

For the procedure, Dr. Wiznia takes [bone marrow](#) from a patient's pelvis and isolates the stem cells. He creates a 3D model of the patient's hip joint so that he can precisely target the areas where bone is dead. He then removes some of the dead bone and injects [stem cells](#)—and places a bone graft—into those regions.

"The treatment is a game-changer because we are targeting an avascular necrosis lesion, which prevents the need for a hip replacement," Dr. Wiznia says.

Provided by Yale University

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