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NEWS

RSNA Press Release

Stem Cells Speed Growth of Healthy Liver Tissue

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At A Glance

- Adult bone marrow stem cells are effective in speeding the growth of healthy liver tissue.
- When used in conjunction with portal vein embolization (PVE), stem cell therapy produced twice the gain in liver volume than PVE alone.
- Cancer patients receiving stem cell therapy with PVE were able to undergo surgery an average of 18 days sooner than patients who underwent PVE only.

OAK BROOK, Ill.—For the first time, researchers have used adult bone marrow stem cells to regenerate healthy human liver tissue, according to a study published in the April issue of the journal *Radiology*.

When large, fast-growing cancers invade the liver, some patients are unable to undergo surgery, because removing the cancerous tissue would leave too little liver to support the body.

Researchers at Heinrich-Heine-University in Düsseldorf, Germany, used adult bone marrow stem cells to help quickly regenerate healthy liver tissue, enabling patients to eventually undergo a surgical resection. "Our study suggests that liver stem cells harvested from the patient's own bone marrow can further augment and accelerate the liver's natural capacity to regenerate itself," said Günther Fürst, M.D., co-author and professor of radiology.

In the study, researchers compared the results of portal vein embolization (PVE), a technique currently used to help regenerate liver tissue, to a combination of PVE and an injection of bone marrow stem cells into the liver.

PVE blocks blood flow to the diseased portion of the liver and diverts blood to the organ's healthy tissue, promoting liver growth. Bone marrow stem cells extracted from the patient's hip bone and injected into the liver also help the liver regenerate.

The study included 13 patients with large central liver malignancies who were unable to undergo surgery because resection would leave less than 25 percent of their total liver volume.

Six of the patients underwent both PVE and injection of bone marrow stem cells. Seven patients underwent only PVE. Computed tomography (CT) scans were performed before and up to five weeks after PVE to determine the degree of liver growth.

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Patients who received the combination of PVE and stem cell injection had double the liver growth rate and gain in liver volume, compared with those who underwent PVE alone. As a result, the patients who received the combined treatment were able to undergo surgery an average of 18 days sooner than patients who received PVE only.

"Our research demonstrates that stem cells are a powerful adjunct to PVE for patients undergoing surgical resection," said Jan Schulte am Esch, M.D., co-author and surgery staff member. "Based on our results, we also believe that adult stem cell administration may be a promising therapy for regenerating livers damaged by other chronic and acute diseases."

The researchers are currently embarking on a randomized controlled trial of the therapy.

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Journal attribution required.

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"Embolization and CD133^{+} Bone Marrow Stem Cells for Liver Regeneration." Collaborating with Prof. Fürst and Dr. Schulte am Esch on this paper were L. Benjamin Fritz, M.D., Ludger W. Poll, M.D., Stefan B. Hosch, M.D., Michael Klein, M.D., Erhard Godehardt, M.D., Andreas Krieg, M.D., Britta Wecker, Volker Stoldt, M.D., Marcus Stockschläder, Claus F. Eisenberger, M.D., Ulrich Mödder, M.D., and Wolfram R. Knoefel, M.D.

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