Surgery Leftovers Could Repair Damaged Hearts

Paolo Madeddu, Professor of Experimental Cardiovascluar Medicine

Scientists have for the first time succeeded in extracting vital stem cells from sections of vein removed for heart bypass surgery. Researchers funded by the British Heart Foundation (BHF) found that these stem cells can stimulate new blood vessels to grow, which could potentially help repair damaged heart muscle after a heart attack.

The research, by Paolo Madeddu, Professor of Experimental Cardiovascular Medicine and his team in the Bristol Heart Institute (BHI) at the University of Bristol, is published in the leading journal Circulation.

Around 20,000 people each year undergo heart bypass surgery. The procedure involves taking a piece of vein from the person’s leg and grafting it onto a diseased coronary artery to divert blood around a blockage or narrowing.

The surgeon normally takes out a longer section of vein than is needed for the bypass. The Bristol team successfully isolated stem cells from leftover veins that patients had agreed to donate.

In tests in mice, the cells proved able to stimulate new blood vessels to grow into injured leg muscles. Professor Madeddu and his team are now beginning to investigate whether the cells can help the heart to recover from a heart attack.

Surface anatomy of the heart

“This is the first time that anyone has been able to extract stem cells from sections of vein left over from heart bypass operations,” Professor Madeddu said. “These cells might make it possible for a person having a bypass to also receive a heart treatment using their body’s own stem cells.

“We can also multiply these cells in the lab to make millions more stem cells, which could potentially be stored in a bank and used to treat thousands of patients.”

Professor Peter Weissberg, Medical Director of the BHF, said: “Repairing a damaged heart is the holy grail for heart patients. The discovery that cells taken from patients’ own blood vessels may be able to stimulate new blood vessels to grow in damaged tissues is a very encouraging and important advance. It brings the possibility of ‘cell therapy’ for damaged hearts one step closer and, importantly, if the chemical messages produced by the cells can be identified, it is possible that drugs could be developed to achieve the same end.”

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