

City doctors turn to stem cell therapy to save limbs

56 Patients Saved From Amputation After Being Injected With Own cells

Pushpa Narayan | TNN

Chennai: After attempting to mend hearts, reverse paralysis and cure blood cancer, doctors have now employed stem cells to save limbs from amputation. A city-based team injected stem cells extracted from the bone marrow of patients who were slated for amputation, after doctors found arteries in their legs had irremovable blocks that led to rotting of muscles in blood-starved areas. Weeks later, the doctors saw growth of new vessels that carried blood to the blood-starved areas. Most of the patients were walking in six months.

The department of vascular surgery at the Sri Ramachandra University along with Life Cell, a private chord blood bank, worked on 60 patients aged between 29-65 years and suffering from critical limb ischemia and advised amputation. "After a six-month follow up, doctors reversed their decision to amputate in all but six patients. The angiogram showed growth of several new small blood vessels," says vascular surgeon Dr K Vijayaraghavan, who was the study's principal investigator. The study is yet to be published in a medical journal.

In patients with critical limb ischemia, severe obstruction of arteries decreases blood flow to the hands, feet and legs, causing severe pain, skin ulcers or sores. Patients can also develop gangrene (rotting of muscles). The most common reason for such diseases include hypertension, high cholesterol, smoking and diabetes, besides traumatic injuries.

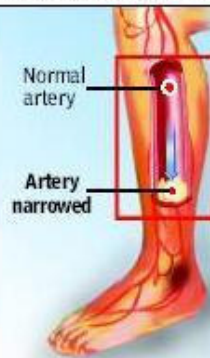
"Some may not require in-

Cure In SIGHT

The department of vascular surgery at the Sri Ramachandra University & Life Cell, a private chord blood bank, worked on 60 patients for the study

WHAT'S CRITICAL LIMB ISCHEMIA

It's characterised by **narrowing and hardening of the arteries** in the patient's limb — hands or legs — caused and or aggravated by diabetes. **It can also be caused by Buerger's Disease, an acute inflammation and clotting of arteries and veins, strongly associated with use of tobacco products.** In some cases, the body copes on its own but it does not happen when the disease progresses



THE SYMPTOMS

Patients suffer severe pain below the knee which degenerates to a point that the patient may no longer be able to walk. With decreased blood flow patients can suffer complications including nerve and tissue damage. **In advanced stages, limb ischemia leads to gangrene. In such cases, amputation is the only option**

WHAT WAS DONE

- ▶ 60 patients slated for amputation were taken for the study
- ▶ 240 ml of blood was drawn from the bone marrow
- ▶ The concentrated 40 ml stem cell was derived from centrifuge

Group 1: Doctors marked 40 potential block areas after angiogram and injected one ml of the stem cells in each area

Group 2: Doctors marked 20 block areas after angiogram and inject one ml of the stem cells in each area. **The remaining 20 ml was injected into the femoral artery, the big blood vessel in the thigh and divided into two groups**

tervention. The blood will find its way through other smaller vessels. In some others, the condition can be reversed through early intervention. But some of them develop progressive gangrene as blood supply can't be restored," said Dr Vijayaraghavan. The study fo-

cused on such patients. The doctors removed 240 ml of blood from the bone marrow and isolated 40 ml of stem cells. Patients were divided into two groups of 30 each. In one group, doctors marked 40 potential block spots from knee to foot and injected 1 ml of stem cells in each spot.

These spots were identified in a cath lab through an angiogram. In another group, 20 ml of the fluid was injected into a large blood vessel in the thigh, the femoral artery, and injected the remaining into 20 potential block spots.

"We saw that they stimulated blood vessels and created new avenues for the blood flow in both the groups. In less than a week, we saw the skin became lighter. In four weeks, most patients had lesser pain. In eight weeks, many could walk and by the 12th week, some even got back to their routine with no trouble," says Dr Vijayaraghavan.

Tests like oxygen saturation and pressure also showed improvement. Angiograms were done in five patients and they showed growth of several small, healthy blood vessels.

Limbs of six patients, however, had to be amputated. "Most of these six patients had uncontrolled sugar levels and other infections," said T Anitha, a research associate.

The department had presented the results of clinical trial at the conference of Vascular Research Foundation in New York last year. "The results have been submitted to the Drugs Controller General of India," she added.

According to Dr N Sekar, vascular surgeon at Apollo Hospitals, the treatment for such cases until some years ago was only amputation. "Now, science is demonstrating that adult stem cells regenerate arteries and restore blood circulation to the limbs. If this turns out to be an approved therapy for patients, several amputations can be avoided," he said.

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