

# **PAD: A Cell Therapy Against Recurrence**

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*Dr. Jean-Marc ALSAC, vascular surgeon at the Georges Pompidou hospital, explains this new preventive treatment by cell transplantation.*

## ***Paris Match: When do we talk about PAD?***

The diagnosis of this vascular disease (arteriosclerosis) is made when leg arteries are occluded by atherosclerotic plaques. The disease develops gradually, over several years, and affects 10% of people over 60 years in France, about 2 million people, most of whom are men. The risk factors are known: age, smoking, hypertension, high cholesterol, diabetes.

## ***What are the symptoms?***

At the first stage, PAD develops without symptoms. In the second stage, the obstruction of the artery begins to limit the irrigation of the limb: the patient, while walking, suffers from cramps in the calf or thigh. At the third stage, where injuries extended themselves over the arterial system, the pain appears at rest. Without treatment, PAD can cause gangrene and may lead to amputation.

## ***Could PAD disease lead to or suggest the presence of other disease?***

In a patient where PAD has been diagnosed, other cardio-vascular lesions have to be systematically searched (coronary and carotid arteries), because, in 50% of cases, the disease has spread to other arterial territories.

## ***These days, what are the conventional treatments?***

At stages 1 and 2, a medical treatment taken orally is required (antiplatelets, statins, etc.), associated of course to a new healthy lifestyle, including smoking cessation and regular physical activity. From stage 3, where pain appears at rest, an intervention is needed. In 60% of patients, we put a stent (a small metal spring that keeps the vessel opened) "endoscopically". In other more severe cases, bypass surgery is performed. With a stenting procedure, immediate results are very good but in 40% of cases, a partial or total re-occlusion of the artery occurs after 1 year and will require a new stent placement or bypass surgery.

## ***What is the cause of these recurrences?***

The stent, by attacking the vascular wall, triggers a process of healing inflammatory reaction, where the repair cells (in the vessel wall) are multiplying excessively, gradually occluding the artery again. In fact, if these cells "runaway" is that they are not well controlled by others ones (the endothelial cells) who, because of illness, are in short supply.

## ***What is this new treatment to prevent these recurrences?***

The goal is to permanently maintain the opening of the treated artery by blocking the inflammatory process at the origin of recurrence. The method consists, after the stent placement, to inject around the vessel vascular endothelial cells from a healthy donor. These cells, cultivated in the cell therapy laboratory at the hospital Saint-Louis, are encapsulated in a gelatin shell.

***What will be the role of these endothelial cells once injected?***

They will strengthen the deficit of the patient's own endothelial cells, this time without excessive inflammatory response due to the factors that these cells secrete. The gelatin shell protects these "foreign" grafted cells against the rejection process, lasting from 1 to 2 months. After this period, they are rejected by the body without side effects.

***What studies have demonstrated the benefits of this treatment?***

Studies in humans have been conducted in the United States on 60 patients. The results showed very good tolerance and a very satisfactory efficacy, after a two years follow-up. In France, we have initiated a study six months ago, with 3 teams, including ours at the hospital Européen Georges Pompidou. We will have results late 2011.