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Pioneering Stem Cell Surgery Announced

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PARIS -- Physicians at four European universities have completed what they say is the first successful transplant of a human windpipe using a patient's own stem cells to fashion an organ and prevent its rejection by her immune system, according to an article in the British medical journal The Lancet. One of the physicians said the surgery could herald a "new age in surgical care."

The transplant operation was performed on the patient, Claudia Castillo, in June in Barcelona, Spain, to alleviate an acute shortage of breath caused by a failing airway following severe tuberculosis. It followed weeks of preparation carried out at the universities of Barcelona, Spain, Bristol, England and Padua and Milan in Italy.

News of the procedure coincided with speculation that President-elect Barack Obama may reverse the Bush Administration's restrictions on stem cell research, which has been contentious in some European countries, too. Anthony Hollander, a professor at Bristol University, said ethical concerns relating to embryonic stem cell research had not surfaced in the latest procedure because it had used only the patient's own stem cells. "This was not embryonic stem cell research," he said in a telephone interview.

Ms. Castillo, 30, was hospitalized in March with her windpipe so badly damaged by tuberculosis that she was unable to walk more than a few steps at a time, according to a statement from Bristol University.

"The only conventional option remaining was a major operation to remove her left lung which carries a risk of complications and a high mortality rate," Bristol University said.

The surgery represented what the university called "pioneering work."

"We are terribly excited by these results," said Prof. Paolo Macchiarini of the University of Barcelona, who performed the operation. "Just four days after transplantation the graft was almost indistinguishable from adjacent normal bronchi."

Moreover, two months after the surgery, lung function tests on Ms. Castillo "were all at the better end of the normal range for a young woman," the Bristol University statement said.

Martin Birchall, a professor at the university, said the transplant showed "the very real potential for adult stem cells and tissue engineering to radically improve their ability to treat patients with serious diseases. We believe this success has proved that we are on the verge of a new age in surgical care."

The Bristol University statement said a segment of trachea, roughly three inches long, was taken from a 51-year-old donor who had died of a cerebral hemorrhage. Using a new technique developed in Padua University, the trachea was stripped of its donor's cells over a six-week period "so that no donor cells remained," the statement said.

At the same time, at Bristol University, stem cells removed from Ms. Castillo's bone marrow, were grown into "a large population" and used to "seed" the donated windpipe using a new technique developed in Milan to incubate cells.

Four days after the seeding, the graft was used to replace Ms. Castillo's damaged windpipe.

Normally after transplants there is a high risk of rejection because the recipient's immune system reacts against the foreign organ. Most transplant patients, thus, use immunosuppressant drugs to prevent rejection.

"The patient has not developed antibodies to her graft, despite not taking any immunosuppressive drugs," the statement from Bristol University said.