Watch: Landmark larynx transplant

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- **Links:**
  Professor Martin Birchall
  The Wellcome Trust
  UC Davis Health System
  UCL Partners
  UCL Centre for Stem Cells and Regenerative Medicine
- **Coverage: BBC News Online**
- **Coverage: The Guardian**

In one of the most complex transplant surgeries ever performed, an international team of surgeons which included Professor Martin Birchall (UCL Ear Institute) has restored the voice of a US woman who had been unable to speak for more than a decade.

The surgical team announced today that they replaced the larynx (voicebox), thyroid gland and trachea (windpipe) in a 52-year-old woman who had lost her ability to speak and breathe on her own. The 18-hour operation, which took place over a two-day period in October 2010, is only the second documented case of its kind in the world. Just 13 days after the operation, Brenda Charett Jensen voiced her first words in 11 years and is now able to speak easily and at length.

She said: "This operation has restored my life. I feel so blessed to have been given this opportunity. It is a miracle. I'm talking, talking, talking, which just amazes my family and friends."

The only other documented larynx transplant took place at the Cleveland Clinic in 1998.

"We are absolutely delighted with the results of this extraordinary case," said Gregory Farwell, associate professor of otolaryngology at UC Davis and lead surgeon for the transplant. "The larynx is an incredibly complex organ, with intricate nerves and muscles functioning to provide voice and allow breathing. Our success required that we assemble an exceptional, multi-disciplinary team, use the most recent advances in surgical and rehabilitation techniques, and find a patient who would relish the daunting challenges of undergoing the transplant and the work necessary to use her new voicebox."

Prior to the transplant, Jensen was unable to speak or breathe normally because of complications stemming from a previous surgery several years ago that closed off her airway and made her completely dependent on a tracheotomy

tube. For more than a decade, she has been limited to vocalising words using a handheld electronic device that produces an artificial, robot-like sound. In order to breathe, she has relied on the tracheotomy, which is still in place and visible at the base of her neck.

Jensen's 18-hour procedure was followed by two months of rehabilitation. Her newly restored voice, while sounding hoarse at times, has improved significantly since the transplant as her nerves regenerate and she learns again how to speak. While the donor organ came from an accident victim, Jensen's voice is her own and not that of the female donor. The transplant has allowed Jensen to smell and taste for the first time in years. She is in the process of relearning to swallow and hopes to soon be able to eat and drink normally again.

Gregory Farwell led a surgical team that included Peter Belafsky and Quang Luu (UC Davis Health System), **Paolo Macchiarini (Karolinska Institutet, Sweden and UCL Ear Institute)** and Professor Birchall. The entire transplantation involved nearly two dozen doctors, nurses, technicians, transplant coordinators and other medical personnel.

Professor Birchall said: **"Despite decades of effort, patients with advanced laryngeal disease or injury have faced reconstructive procedures that are literally 150 years old. This transplant provides us with a much greater understanding about the viability of laryngotracheal transplantation and patient response, and it may prove to be a good option to help other people."**

Professor Birchall is also a Consultant Laryngologist at the Royal National Throat, Nose and Ear Hospital and Director of the Ear Nose and Throat programme within UCL Partners (UCLP). He said: "This is an example of a highly innovative technology, done for the first time in man, and it's just the sort of thing that should be done in an academic health science centre like UCLP – the biggest AHSC in Europe. We are uniquely placed to take the products of science, as we have in this case, and put them into human beings in the clinic, through the wonderful partnership of the healthcare trusts in UCL Partners and the world class university set-up of UCL."

The Wellcome Trust have been a key supporter of Professor Birchall's research. Dr John Williams, Head of Clinical Activities at the Wellcome Trust, said: "This is a truly extraordinary achievement and a genuine breakthrough. Professor Birchall and colleagues have clearly transformed the life of their patient and their work offers much hope both for patients in need of similar procedures and indeed for research into transplantation and regenerative medicine in general."

Image: Professor Martin Birchall

UCL Context

UCL, Great Ormond Street Hospital for Children NHS Trust, Moorfields Eye Hospital NHS Foundation Trust, the Royal Free Hampstead NHS Trust and UCL Hospitals NHS Foundation Trust (UCLH) together make up UCL Partners, designated one of the UK's first academic health science centres by the Department of Health in March 2009.

UCL Partners brings together the combined skill and expertise of its clinicians and researchers to focus on child health, eyes and vision, immunology and transplantation, infectious diseases, neurological disorders, women's health, cardiovascular research and cancer.

The UCL Centre for Stem Cells and Regenerative Medicine brings together more than 150 research groups from several faculties, specialised hospitals and institutes across UCL – including the MRC National Institute for Medical Research (NIMR) – with a common interest in all aspects of stem cells, tissue engineering, repair and regeneration and the development of their therapeutic and biotechnological potential.