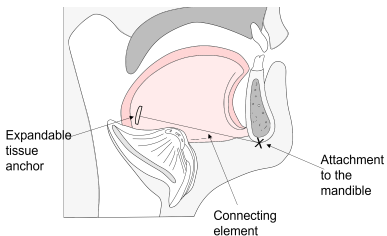


Apnea Treat- a minimally invasive implant for Sleep apnea therapy

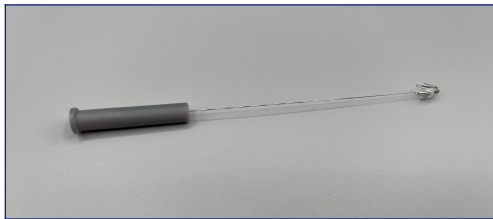
Obstructive sleep apnea (OSA) is affecting 425 Mio people worldwide and is characterized by recurrent breathing pauses caused by a reduction in muscle tone in the soft tissue in the upper airways, e.g. when a patient's tongue collapses on the back of the throat. These pauses can last for minutes, which can lead to a drop in the oxygen concentration in the blood and ultimately to an insufficient supply to the organs.



The tissue anchor is inserted minimally invasively using an implantation system

Researchers from Ostbayerische Technische Hochschule Regensburg and University Hospital Regensburg have developed a minimally invasive, balloon-expandable implant for the treatment of OSA, which can be implanted without access from the oropharynx and reliably prevents collapse of the airways.

- 01 Treating sleep apnea without the need for patient compliance
- 02 Minimal tissue damage, no discomfort to be expected
- 03 Pretension can be adjusted by the surgeon (infinitely variable adjustment, can also be adjusted subsequently)
- 04 Low manufacturing costs for the implant system



Prototype of the tissue anchor and the implantation system

IP RIGHTS

PCT was filed in 2024

2024

CHALLENGE

In addition to changes in sleeping habits, severe OSA is currently treated with continuous positive airway pressure (CPAP) therapy. However, this method relies heavily on patient compliance and around 26% of patients discontinue the CPAP treatment within the first 3 months. An alternative, a surgical insertion of neurostimulating implants („tongue pacemakers“) is a demanding procedure, batteries have to be changed and the technology is often not compatible with magnetic resonance imaging.

INNOVATION

The invention describes an implant for the treatment of OSA which stabilizes the tongue during sleep, thereby preventing obstruction of the airways. The tissue anchor is inserted during a 30-minute minimally invasive procedure and anchored in the tongue tissue via a balloon catheter. The distal anchor element may have an umbrella-like structure, which radially expands around a pivot to assume the deployed configuration. The implant allows for normal tongue movement, but prevents a collapse of the airway. The patient can activate the implant via tongue movements that do not occur in everyday life.

TRL 08

TRL 07

TRL 06

TRL 05

TRL 04

TRL 03

TRL 02

TRL 01

Technology Readiness Level (TRL)

01 Basic principles observed · 02 Technology concept formulated · 03 Experimental proof of concept · 04 Technology validated in lab · 05 Technology validated in relevant environment · 06 Technology demonstrated in relevant environment · 07 System prototype demonstrated in operational environment · 08 System complete and qualified



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