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Press Statement

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First in the World middle ear transplant done at Steve Biko Academic Hospital

A pioneering surgical procedure using 3D-printed middle ear bones, developed by Professor Mashudu Tshifularo and his team at the University of Pretoria (UP) Faculty of Health, may be the answer to conductive hearing loss, a middle ear problem caused by congenital birth defects, infection, trauma or metabolic diseases.

The surgery, can be performed on everyone including new-borns. On Wednesday, 13 March 2019, Prof Tshifularo has successfully performed transplant surgery that allowed a 35 year old male recipient, whose middle ear was completely damaged in a car accident, to hear again. The procedure effectively replaces the hammer, anvil, and stirrup, the ossicles(smallest bones in the body) that make up the middle ear. 3D-printing technology was used to print these bones, and then used in the surgery to reconstruct the ossicles.

“By replacing only the ossicles that aren’t functioning properly, the procedure carries significantly less risk than known prostheses and their associated surgical procedures,” Prof Tshifularo explains. “We will use titanium for this procedure, which is biocompatible. We use an endoscope to do the replacement, so the transplant is expected to be quick, with minimal scarring.” According to the South African Hearing Institute, our hearing ability naturally declines from age 30 or 40. In fact, by age 80, more than half of humans will suffer from significant hearing loss. While hearing loss is a natural part of ageing, it could also occur as a result of disease or infection. It may also be inherited or be the result of physical damage to the ears or head. The surgery also aims to simplify the reconstruction of ossicles during middle ear procedures, such as ossiculoplasty and stapedectomy, in order to increase the chance of success with minimal intrusion trauma. In addition, Prof Tshifularo’s procedure reduces the chance of facial nerve paralysis, which can occur if the facial nerve that passes through the middle ear space is damaged during traditional surgery.

“3D technology is allowing us to do things we never thought we could,” says Prof Tshifularo, who is head of the Department of Otorhinolaryngology(Ear, Nose and Throat) at UP. “But I need sponsors and funding for this invention to take off the ground.”

For Prof Tshifularo, “innovate or perish” are words to live by when it comes to clinical procedures, teaching, research and medical devices, and believes that academics have a responsibility to come up with solutions that benefit communities.

"As a Department of Health, we shall do everything in our power to assist and mobilize resources to make sure that Prof. Tshifularo gets all the help he needs for this far reaching innovation", said Minister Motsoaledi. The Minister also calls upon donors and development partners, especially business community in South Africa to support this, South Africa's scientific break through.

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