Ultrasound procedures get a 3D-printed boost

Jose Hong

Ultrasound medical procedures, ranging from surgery to real-time monitoring, are one step closer to being more accurate with fewer harmful side effects.

Scientists at Nanyang Technological University (NTU) have developed a new ultrasound device that can produce sharper images and more focused ultrasound waves through 3D-printed lenses.

The lenses employed nowadays are made of glass and are therefore restricted to either cylindrical or spherical shapes, a limitation which reduces the clarity of ultrasound imaging generated through them and results in less focused waves.

With 3D printing, complex lens shapes made of resin can be produced, resulting in sharper images. This means ultrasound waves can be focused at multiple sites in the target area, something that is not possible with current technology, which limits lens shapes.

The scientists behind the research said this new device would allow for ultrasound medical procedures that, for example, could kill tumours, deliver drugs into targeted cells and loosen blood clots in a more accurate way.

The new system – which can be used as a scanner or to produce ultrasound waves for treatment procedures, among other things – was developed by a multidisciplinary team of scientists, which was led by Associate Professor Claus-Dieter Ohl from NTU’s School of Physical and Mathematical Sciences.

Their findings were published in October in the peer-reviewed journal Applied Physics Letters.

Said Prof Ohl: “In most medical (surgical procedures), precision and non-invasive diagnosis methods are crucial.

“This novel device not only determines the focus of the wave but also its shape, granting greater accuracy and control to medical practitioners.”

According to him, the NTU team needs to develop a prototype, which will be ready in about six months, after which lab tests will begin.

The device will then move to regulatory checks and later towards clinical trials, after which it will hopefully hit the market.

Right now, the team is working with two industry players, one of which is a clinical company.

Adjunct Assistant Professor Tan Cher Heng, a radiology expert at the Lee Kong Chian School of Medicine at NTU, said: “This is a very promising breakthrough, potentially offering significant clinical benefits, including to the field of cancer imaging.”

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