

This is a series that spotlights rare diseases or unusual conditions.

3D-printed implant brings woman relief after years of jaw pain

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Since she was in her 40s, Madam Kong Choy Foong had experienced occasional pain in her jaw, but dismissed it as it was fleeting and intermittent.

Over time, the pain became worse, and Madam Kong, now 71, would feel a sudden, sharp pain in her jaw – coming at unexpected times such as when she was eating – as if her jaw had been dislocated.

“Sometimes the pain came when I was sleeping, waking me up at night,” said the retired supermarket assistant.

After visits to a dentist and hospital, it was a unique treatment which helped Madam Kong get rid of the pain – her jaw joint was replaced with a customised, 3D-printed implant.

While such procedures have been performed elsewhere, she is believed to be one of the first in Singapore to receive such a treatment.

When she visited a neighbourhood dentist five or six years ago, the dentist suspected that the pain was caused by teeth grinding and recommended that she wear a dental splint – an orthodontic device used to reduce excessive strain on jaw joints – on her lower jaw.

But there was no relief.

In 2020, she was referred to Ng Teng Fong General Hospital for temporomandibular joint pain, referring to the joint that connects the lower jaw to the skull, and persistent limited mouth opening.

Following further investigations by the hospital’s oral and maxillofacial surgery team, Madam Kong was referred to the National University Centre for Oral Health Singapore (NUCOHS) in January 2022, a national dental centre under the National University Health System.

There, clinical examination showed swelling at her right jaw joint, with radiographic tests revealing a 2.5cm growth around the jaw joint. The growth was removed via open joint surgery in September 2022.



Madam Kong Choy Foong, who was diagnosed with pseudo-gout in her right jaw joint, with Associate Professor Asher Lim, who treated her. The condition has symptoms similar to gout, such as pain and swelling in and around the joints. Prof Lim said having a growth at the jaw joint is not common. ST PHOTO: GIN TAY

Madam Kong was subsequently diagnosed to have pseudo-gout of her right temporomandibular joint.

As the name suggests, pseudo-gout – otherwise known as calcium pyrophosphate deposition disease – has symptoms similar to gout, such as pain and swelling in and around the joints.

Whereas gout is caused by high levels of uric acid in the blood, pseudo-gout results from a build-up of calcium crystals in the joints.

It is unknown why these crystals

form, though low magnesium or an abnormal thyroid gland have been posited as contributing factors.

Seniors are more likely to get pseudo-gout, with the American College of Rheumatology suggesting it affects about 3 per cent of people in their 60s. The condition typically affects larger joints such as the hips, knees and shoulders, with pseudo-gout in the temporomandibular joint being rare.

Associate Professor Asher Lim, who treated Madam Kong, said she

may not have been correctly diagnosed previously as there are many different causes for temporomandibular joint pain.

“Having a growth at the jaw joint is not common,” said the oral and maxillofacial surgery senior consultant at NUCOHS.

Madam Kong’s relief was short-lived, as the growth returned within nine months of the surgery.

Eventually, she could open her mouth only about 5mm, affecting her ability to speak and eat as well

as causing her immense pain and discomfort.

To provide her with a longer-lasting solution, Prof Lim led a team to replace her jaw joint with a customised, 3D-printed implant.

While the use of stock synthetic joints or a patient’s own bones to replace the joint is possible, Madam Kong’s age made such approaches less viable, thus calling for the need for a customised solution.

It was found that a medical



A customised 3D-printed implant – made of a titanium alloy and ultra-high molecular weight polyethylene – was used to replace Madam Kong’s right jaw joint. PHOTO: NATIONAL UNIVERSITY CENTRE FOR ORAL HEALTH SINGAPORE

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equipment manufacturer in Australia could produce the implant, made of a titanium alloy and ultra-high molecular weight polyethylene, a non-toxic thermoplastic that is resistant to corrosion and abrasion.

The company was provided with a computed tomography scan of Madam Kong’s jaw, which helped it to make a personalised implant.

In May 2024, she went under the knife, which involved removing the growth and the right coronoid process – part of the skull above the angle of the jaw – before replacing the temporomandibular joint with the implant.

Risks associated with such procedures include damage to the facial nerve, which could result in the face becoming partially paralysed, or infections caused by damage to the salivary gland, Prof Lim noted.

But Madam Kong’s surgery went without a hitch, and she is now able to talk and eat normally.

While she was worried before undergoing her initial surgery in 2022, Madam Kong had fewer concerns about going under the knife the second time around.

“I was more assured because it’s the same doctor, so I knew the outcome would be good,” said the grandmother of two.

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