Clamp from IIT-M to help fix blood vessels

Device Likely To Cut Cost, Complications

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A tiny clip-like instrument, not larger than a thumb nail, sits on the table of senior plastic surgeon Dr V B Narayanamurthy of Global Hospitals. As someone who operates on blood vessels, he is sure this eversion clamp, 'Nstomoz,' will revolutionise the way people like him work besides reducing cost and complications of surgeries.

Reconnecting blood vessels, a procedure called vascular anastomosis, is one of the most tricky jobs of a junior surgeon.

Specialists, including in vascular, cardiovascular, plastic and transplant surgeons, master it through years of practice. A wrong stitch can cause complications such as thickening of the inner-most layer of the blood vessel, tunica intima.

The process is so delicate that sometimes trauma patients' limbs are amputated because there are no specialists to suture blood vessels.

"It's tough for beginners. Some are so disappointed with their skill levels that they stop doing it altogether," says Dr Narayanamurthy who has been teaching microvascular surgeries for 15 years.

After one such tiring training session nearly five years ago, the surgeon briefed researchers in the department of engineering design at IIT-Madras about the need for devices that can help people like him.

Two years ago, an M Tech student in the department of engineering design at IIT-Madras decided to develop a clamp for micro vascular surgeries as part of a project. "I spent several days listening to doctors and watched them perform surgeries. I realised that the procedure was complex and long because the blood vessels collapse when they suture it," said Anand Parikh, research scholar at IIT-M wo worked on the project.

Clamps are used to stop blood flow into vessels that need to be sutured.

Traditionally, once a doctor clips the vessels with these clamps, they shrinks, making it tough for doctors to do the end-to-end stitches.

Nstomoz was developed to ensure that the vessel does not collapse. This innovation won the Gandhian Young Technological Innovation (GYTI) Award for the product at earlier this month.

In laboratory conditions, the clamp was found to help surgeons suture vessels at twice the speed of the conventional method.

The team is now looking at manufacturing these surgical clamps for the market. "We have filed for two patents. The product will be launched from the incubation ecosystem of IIT Madras," said department of engineering design professor Venkatesh Balasubramanian.

RECONNECTING THE LIFELINES

The procedure is called vascular anastomosis and a wrong stitch can cause complications such as thickening of the inner-most layer of the blood vessel, tunica intima

During vascular surgeries doctors use a clamp to prevent blood flow. This shrinks the blood vessel making it difficult for doctors to do the end-to-end sutures

What the new clamp can do

- **The new clamp prevents blood flow,** but keeps the tunica intima open so surgeons have enough working space to do the stitches

Benefits

- Stitches can be done **more effectively and quickly**
- Lowers risk of complications **such as thickening of vessels**

New clamp developed by IIT-Madras

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- **Product will be launched from** the incubation ecosystem of IIT Madras
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The department of engineering design at IIT-M, which developed the device, has filed for two patents, says professor Venkatesh Balasubramanian

> **At least 80,000 limbs can be preserved across India** if we have surgeons who can be trained in vascular surgery
>
> **Dr N Sekar** | VASCULAR SURGEON