

Surgery without stitches

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A thin polymer bio-film that seals surgical wounds could make sutures a relic of medical history. Measuring just 50 microns thick, the film is placed on a surgical wound and exposed to an infrared laser, which heats the film just enough to meld it and the tissue, thus perfectly sealing the wound.

Known as Surgilux, the device's raw material is extracted from crab shells and has Food and Drug Administration approval in the US.

Early test results indicate that it has strongest potential for use in brain and nerve surgery because it can avoid the numerous disadvantages of invasive stitches/sutures, which fail to seal and can act as a source of infection.

Up to 11% of brain surgery patients have to return for repeat surgery due to leakage of cerebro-spinal fluid (CSF) and other complications arising from sutures.

Surgical sutures date back some 4,000 years, so a new approach is long overdue, according to one of the device's inventors and leader of the Bio/polymer Research Group, UNSW scientist John Foster.

“Others have tried surgical glues but these are mainly gel-like so bonding to the tissue is uneven often resulting in leakages and they're not easy to use. The strongest surgical glue is so toxic that it's limited to external applications,” says Dr Foster. “Other devices use ultra-violet light to effect rather poor sealing, but UV rays are damaging to living cells

“The beauty of this is that infra-red laser doesn’t cause any tissue damage. Better still, Surgilux has anti-microbial properties, which deters post-operative infections.”

Foster and his team are working with micro-surgeon Marcus Stoodley who specialises in nerve repair. Based at the Prince of Wales Hospital Stoodley is excited about early test results.

“Surgilux is well suited to repairing damaged nerves because the gold standard -- sutures – inevitably cause damage to nerves and there is always some permanent loss of function.

“Our test results with rats have shown some degree of permanent nerve recovery within six weeks of operating.”

The researchers – who are looking for commercial backing to initiate clinical trials – are planning a second generation version of Surgilux that incorporates growth factors and perhaps stem cells to regenerate nerves.

Source: University of New South Wales

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