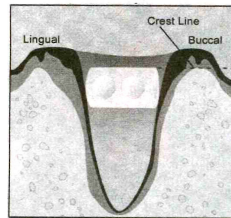


Scaffolding to aid tooth implants

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By Ng Wan Ching

Base: The bio-scaffold helps promote bone growth for people who have lost their permanent tooth. The bone base is used to hold tooth implants later.



POSITION: (Above) The bio-scaffold is placed into the hole created by the tooth extraction. Buccal is the tooth surface next to the cheeks. Lingual is the tooth surface next to the tongue.

GRAPHICS:
Courtesy of BIO-SCAFFOLD
INTERNATIONAL

Device will dissolve within months

IT'S tiny and looks like a cheese cracker roll, with holes in it.

But this ingenious little device is making life much easier for people who have lost their teeth. It's bio-scaffolding, made of biodegradable material derived from sugar cane.

It is placed into the hole or socket left by the tooth. (See graphics.)

This helps to promote bone growth which is important for tooth implants later on. Implants need a bone base to hold them steady.

The bio-scaffold also helps to prevent the hole or socket from collapsing.

When people have their teeth removed, a certain amount of bone is also lost.

Said Dr Victor Fan, consultant oral and maxillofacial surgeon at the National University Hospital (NUH): "If you leave the hole alone for three months, there will be significant bone loss."

The bio-scaffold, placed there immediately after the tooth extraction, allows bone to grow into it. "Good results can be seen after four to five months," said Dr Fan.

Current bone grafting techniques may involve getting tissues from another part of the body or the use of artificial implants and reconstructive materials that remain in the body for life, with complications of rejection and infection.

Said Dr Fan: "With the bio-scaffold, the patient won't need to go through bone-grafting surgery which is expensive, and may be unpleasant and painful."

Bone loss

In a study of 40 patients, Dr Fan found that those who did not have the scaffold placed in the socket suffered an average of 1 to 2mm of bone loss after tooth extraction. Those who had the scaffold placed in the socket had an average growth of 0.133mm of bone.

“The conclusion is that the scaffold helped to preserve the alveolar bone (the bony structure that supports the teeth) and prevented its loss after extractions,” said Dr Fan.

Promoting bone growth after tooth extraction is only one of several possible application for the bio-scaffold.

Said Dr Fan: “Very often, major trauma and cancer surgery result in missing segments of jawbones or other parts of the facial skeleton.”

The patient needs reconstruction of such defects to resume normal body function, and the regeneration of bone is important in the reconstructive surgery.

With the use of a bio-scaffold, it will be possible to direct bone growth in certain defects to replace lost structures.

With further development, other tissues like cartilage and skin can also be directed to grow into these bio-scaffolds which are important for facial, cosmetic and reconstructive surgery.

This will greatly benefit patients who will not need to have complicated bone or skin-grafting surgery, resulting in reduced pain, faster recovery, shorter hospitalisation, and lower healthcare cost.

For a scaffold to be clinically applicable, its manufacturing process must be flexible enough to vary pore size so as to promote bony ingrowth while retaining necessary configuration, shape, and strength for clinical use.

The bio-scaffold, trade-named Bioscaff Alvelac, was jointly developed by Bio-Scaffold International and National University of Singapore researchers.

The material, which is also used in stitches after surgery, can bio-degrade in the body within two to six months without leaving any toxic side effects and yet retain the crucial strength and shape needed to guide the growth of bone in that time.

Future applications

Said Mr Victor Lee, chairman and chief executive of Bio-Scaffold International: “We will introduce the bio-scaffold for applications in aesthetic and craniofacial reconstructive surgery in the near future.”

The bio-scaffold was rolled out to dental surgeons in July. Right now, the cost of having one placed in the socket after a tooth extraction is \$200 to \$500 (for extraction and the scaffold) at NUH.

“Two to four months later, I get the patients back to do the implants,” said Dr Fan. Depending on the dental surgeon, implants can cost \$4,000 to \$5,000 per tooth.