Surgical Binding Component

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Technology description

The invention provides a binding wire made of superelastic braided structure that binds biological tissues and bones. It flattens under tension to spread the bone cutting forces to a larger area, hence reducing the stress when compared to conventional round wire.
Offer competitive advantages as compared to conventional metallic cables used for any bone reattachment given their flexibility, low profile and capacity to prevent loosening during micro-movement and bone remodeling

Background

Most heart or lungs surgical procedures are performed through a midline longitudinal cut of the sternum which must be closed after surgery. Surgeons currently use stainless steel wire closure devices that are unwieldy, difficult to manage while operating and are subject to breaking during the installation or after the surgery. Under stress during the rehabilitation phase, they can also cut into and through the bone of the sternum.

Proposed technology

The invention circumvents the inconvenience associated with steel wires. It provides for a method that binds biological tissues and bones in particular. The binding wire is a braided structure that flattens under tension to spread the bone cutting forces to a larger area, hence reducing the stress when compared to conventional round wire. It is made of shape memory metal which can accept large elongation (super-elasticity) and can still recover the pre-tension to maintain the joining pressure required at the boundary of the tissues to be joined. This situation happens, for instance, when the patient coughs after a thoracic surgery.

Application area

Binding human tissues and bones, fascias for healing purposes (well adapted for sternum closing after a surgical operation)

Advantages

Reduces the risks of sternum disruption, cutting into and through the bone of the sternum, as a result of post-operative stress on the closure loops, like coughing or deep breathing.
Recovers the boundary contact pressure after large displacements.
Capacity to prevent loosening during micro-movement and bone remodeling
Flexible and easy to use.
Reduces risk of stab wounds to surgeons and their assistants.
Eliminates risk of binding component breakage during installation.
Provides increased contact surface with relatively no sharp edges that could cause hemorrhaging.
Reduces the risk of injury to soft tissues during sternum closure.
Facilitates ergonomic handling of the binding structure during surgery.
Shows little, if any, tendency to kink or snarl.
Can be easily severed, rendered ineffective or removed should the sternum need to be re-opened.
Can be easily cut using a conventional surgical tool e.g. a surgical scissor

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