

Surgical device for interrupted suture

Surgical device consisting of a loading and firing mechanism that performs interrupted sutures quickly, easily and safely during surgical procedures with minimally invasive techniques.

Description and essential characteristics

The surgical device for interrupted sutures has a hollow needle, designed to perforate the tissue and enable the passage of biocompatible T-suture thread that incorporates a limiter or anchor at the tip. The device also has a cylindrical rod, sized for inserting and moving linearly within the needle's canal to push the anchor and expel it out the other end of the needle.

The device is provided with a general double coaxial sheath structure. The innermost sheath mounts the suture thread with its limiter. Once the needle has penetrated all layers of the abdominal wall using a plunger-pusher-rod system, the thread is pushed into the interior of the body cavity in such a manner that when the needle is withdrawn the limiter anchors the thread onto the abdominal wall. Outside this sheath there is another concentric sheath, which comprises the safety mechanism, so that the outer sheath or needle wall terminates at a cutting end, which penetrates the various layers of the abdominal wall. When the system perforates all the layers and reaches the cavity, the inner sheath or distal and blunt end of the anchor advances and exceeds the outer sheath. The abdominal viscera are thereby protected from potential lacerations by the cutting end of the outer sheath. Performing the same operation on the opposite side of the wound, it is then only necessary to tie the two suture threads to proceed with the closure of the orifice. The entire operation is therefore performed from outside the body, without the need for internal manipulations.

The safety mechanism prevents the throwing of the T-suture thread and also provides an indication to help determine when the tissues to be sutured have been completely penetrated. This prevents an erroneous puncture during an operation, which would place the thread in a suboptimal site.

Competitive advantages

The main advantages of this invention are the following:

1. The device allows for a hollow needle to be attached for perforating selected tissues and allows for T-suture thread to be mounted.
2. The T-suture thread can be inserted into the device before the puncture.
3. The device can be preloaded, offering a safe position that (a) prevents undesirable punctures by placing part of the anchor of the T-suture thread in front of the needle's tip; (b) allows for one or several punctures to be performed before delivering the T-suture thread; and (c) provides an indication of tissue penetration.

4. Once the puncture has been performed, the device can be activated, reaching the discharge position in which it will throw the T-suture thread to the other side of the tissue to be sutured.

Type of collaboration sought

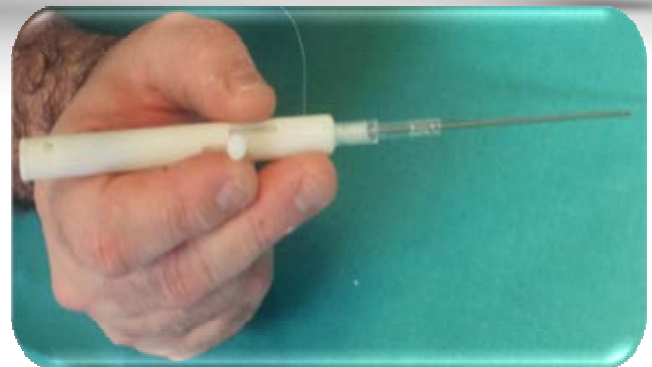
Cooperation is sought with any Party interested in partnering, licensing or investing in the technology, whether it be an investor to fund the project, a partner interested in getting involved in any of the various phases until its placement on the market, a patent licensee, etc. The organisations potentially interested in this technology are those devoted to the manufacture, commercialisation and/or distribution of healthcare products, particularly medical devices; as well as hospitals, health centres, universities, research centres and all types of institutions engaged in the training of healthcare professionals.

Current stage of development

An initial prototype was developed and built. After performing various preclinical trials on pigs, the device was perfected. The definitive prototype was validated by a team of surgeons at La Paz University Hospital.

Current state of intellectual property

Spanish patent P201031491, granted in March 2014.
International patent application PCT/IB2011/002352.
European patent 11826146.0 and US patent 13/878035, applied for in October 2011.



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