Title: HOLDER MEANS FOR USE AT E.G. SPINE SURGERIES FROM THE ABDOMEN, AND TOOL MEANS FOR HANDLING SAID HOLDER MEANS

Abstract: A holder means for use at e.g. spine surgery from the abdomen, and a tool for removal of said holder means. The invention is characterised in that the holder means (1) has a tip end (3) with associated bendable shank portions (4, 5) and that a protecting cover means (2) of a soft resilient material surrounds the tip end of the holder means and is displaceable in relation to said tip end.
Holder means for use at e.g. spine surgeries from the abdomen, and tool means for handling said holder means.

The present invention relates to holder means for use at e.g. spine surgery from the abdomen, more precisely to means spikable into the spinal column and having permanently deformable shank portions with an essentially uniform cross section. The invention also relates to tool means for handling said holder means.

In connection to spine surgery being performed from the abdomen the stomach is one of the objects, which has to be removed in a lenient way to provide access to the spine. The aid of assistance commonly used has been awkward to handle and has to a certain degree also made it more difficult to get access to the spine.

In case to be able to perform an attachment of means by spiking into the spinal column for keeping the intestines away, the risk for damage onto nerves and blood vessels, both in attachment and detachment of said means, must be eliminated.

The object of the present invention is to eliminate the above mentioned problems and to provide holder means to be used e.g. in spine surgery from the abdomen and which is easy to handle, which will be safely locked in place and which is easily applied and removed with the aid of a certain tool after the surgery, and which essentially and completely eliminates the risks of injuries onto nerves and blood vessels during use.

The holder means has a tip end with associated bendable shank portions and a protecting cover means of a soft resilient material surrounding said tip end and being displaceable in relation to it, which allows a steady and reliable attachment of the holder means. Thus, according to the present invention it will be possible to safely use the tip end of the holder means to keep back blood vessels and nerve tissues in connection to the spine in searching for a proper spot for nailing. The
leniency to sensible tissue will be further increased if the cover is given a semicircular cross section as it then will be possible to use the rounded part of the cover as a support for said sensitive tissue in the searching for a suitable spot for attachment (nailing) the holder means into the spinal column.

In creating a special arrangement for attachment at the back of the tip end of the holder means, which arrangement is designed to be used together with a tool for inserting and/or withdrawal of the holder means, a positive contact with said tool is ensured. The tool can be a mandrel for nailing, or means for withdrawal. The attachment arrangement can have the shape of a threaded stud to co-operate with an unthreaded recess in the inserting means or with a threaded recess of the tool or of the withdrawal means.

Preferably a mandrel is used in inserting the holder means, and hammer strokes at the upper end of said mandrel is facilitating the inserting into the spinal column.

Provided that a metal washer is loosely arranged at the upper part of the tip end of the holder means and resting on the protecting and resilient cover, said washer can be used as impact means co-operating with a protruding means of the tool to remove the holder means from the spinal column after a performed surgical operation.

Preferably the tool has a forward end with a threaded recess for a positive co-operation with the threaded protrusion at the holder means. At a removal of the holder means after a surgical operation of the spinal column the forward end of the tool is locked at the threaded protrusion at the rearward part of the tip end of the holder means, whereupon the tool is twisted with the locked holder means, and a lever mechanism can be activated in connection to the holder means being brought backwards to disengage the spinal column. This activation of the lever mechanism will influence protruding means bearing with the forward end (ends) against
the resilient and protecting cover, preferably by way of a metal washer. A withdrawal of the end of the tool and the holder means will take place simultaneously with a corresponding protruding of the protruding means, which means that the protective cover will remain in position corresponding to nerve tissue and blood vessels until the tip end of the holder means is fully withdrawn into the protective cover. This will further increase the safety in the removal of the holder means. Furthermore, if the tool is provided with a gun’s grip where a trigger activates both the holder means and the protruding means, an applying of the withdrawal force is facilitated together with a steady fixation of the tool end at the withdrawal of the holder means.

The invention will now be described in connection to a shown embodiment, wherein;

Fig. 1 is a side view of a holder means 1 with a tip end 3 protected by a cover 2 and with shank means 4, 5 at a starting point. The enclosing protective cover 2 with a semicircular shape is lowered downwards and covers the tip end 3 completely. The extended holder means according to the invention is brought with its tip end into the spine column by the aid of a mandrel 6 which loosely can receive the holder means 3 in a recess 7, and by the use of a hammer (not shown). After the attachment the mandrel is removed and the shank portions is bent to the desired shape to act as support means for organs, muscles and/or tissues to create an access to the place for the surgical operation.

In fig. 2 the holder means is shown in a fully inserted position, i.e. with the protective cover pushed up along the forward tipped portion 3A of the holder means.

In fig. 3 a tool 8 for removing the holder means 1 is shown. This tool is used after the surgery has been carried out and is brought to cooperate with the holder means 1 at the rearward part of the forward portion very well being threaded or equipped with a bayonet lock by which
the recess in the tool will intervene, whereupon a twisting of these is performed in such a way that the tip end inserted in the bone will be released. Holder means with cover means and tool means will carefully be removed during a simultaneous holding of the protective cover until the tip end 3 is completely covered of the cover 2. This is done by activating a couple of pin means 9, 10 which will push down the protective cover at the same time as the holder means is pulled upwards using the tool. Fig. 4 is a schematic side view of the tool 8 and the lever mechanism 11 acting on the pin means 9 and 10 by use of the trigger mechanism 12.

The above referred combination of holder means/tip means is very simple to handle and constitutes an adequate support for muscles, tissues, and/or organ which otherwise should have blocked an access to the place for surgery.

The invention is not restricted to the embodiment shown in the figures, but modifications can be done within the scope of the following claims.
CLAIMS

1. A holder means for use at e.g. spine surgery from the abdomen, characterised in that the holder means (1) has a tip end (3) with associated bendable shank portions (4, 5) and a protecting cover means (2) of a soft resilient material surrounding the tip end and being displaceable in relation to said tip end.

2. A means according to claim 1 characterised in that the protecting cover (2) has an essential semicircular cross section.

3. A means according to claim 1 or 2, characterised in that in connection to the rearward end of the tip end of the holder means there are special attachment means to be used together with a tool for inserting and/or removal of the holder means.

4. A means according to claim 3, characterised in that a threaded pin forms the attachment means used to co-operate with a threaded recess in the tool.

5. A means according to one or several of the preceding claims, characterised in that a metal washer is loosely arranged around the upper part of the tip end of the holder means and bear on said protective cover, said washer is intended to form impact means for projecting means of a tool used for removal of the holder means.

6. A tool for removal of a holder means according to any of the preceding claims, characterised in that the forward end of the tool has a threaded recess for attachment with the holder means, that a lever mechanism is connected to
said holder means to apply a pulling force onto said means, and a projecting means is arranged and bear on impact means on an upper part of the protective and displaceable cover, wherein a bringing back of the tool end and the holder means at the same time exerts a projecting of the projecting means in a corresponding extent to keep the protective cover stationary relative to nerve tissue and blood vessels, i.e. so that the tip end all the time is covered during the withdrawal of the tip end of the holder means.
INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 00/01526

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61B 17/02
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<td>DE 3709706 A1 (OLYMPUS OPTICAL CO.), 8 October 1987 (08.10.87), column 4, line 52 - column 6, line 3, figures 1-9</td>
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