

Needle withdrawn from







Trocar pulled outwards to reveal lower drill hole opening again so that Thread can be removed from trocar drill hole

Trocar rotated about 180°

(or smaller angles as appropriate for location of suture around port opening) and pushed back inwards to level of markings.



Needle inserted into trocar drill hole, through muscle tissue and into abdominal cavity on other side of opening. Forceps used to reposition thread on needle hook.

Suture safely snugged up around the trocar watched by the intra abdominal telescope. (For multiple individual or continuous sutures, trocar would be kept in until all suture threads in place, With each thread ightened and snugged up against sides

thread hooked onto arrying needle and no rough trocar drill hol

e tissue and into abdominal . Angle of needle relative t

uscle tiss

avity

edl

Needle withdrawn to loop to be grabbed by forcens from different

Needle withdrawn so that point is just within the trocar. (mark on needle at point of asterisk would assist the re).

to tighten loop against the peritoneal lining and draw muscle tissue together, maintaining the

massre ussue togetner, maintaining the pneumoperitoneum. Suture site can be inspected with the telescope inside the abdomen. Suture tied against outside of muscle layer.

Trocar rotated to site of next suture leaving thread still in situ.

e end of suture thread led through into ominal cavity with

Continuous Suture:

to depth o

markings (observed from

forcens



Angle of needl Trocar say 30°

Thread Carrying needle & ne pushed through trocar drill hole, muscle tissue and into abdominal cavity. loop to be grabbed by for from different port. lative to

lower opening o ale so that thread

wed from

pulled through into abdo Cavity with forceps.

ed about 180

(or smaller angles as appropriate for location of suture around -

of suture around port opening) and pushed inwards to level of

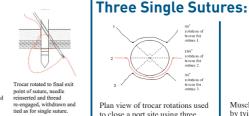
markings

thdrawn fro

Needle reinserted into trocar drill hole, through muscle tissue and into abdominal cavity on other side of opening Forceps used to reposition thread on needle hook

Trocar pulled outwards to reveal lower opening of drill hole so that thread can be removed from drill

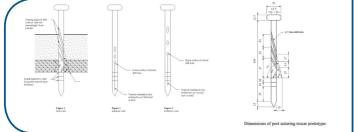
Needle withdrawn through tissues and trocar drill hole, bringing thread with it to



Plan view of trocar rotations used to close a port site using three single sutures.

Muscle tissues drawn together by tying individual sutures after removal of the trocar.

Changes to Increase Accuracy and to Suture Port Sites in Obese Patients:



Repair of Established Port Site Hernias:

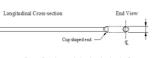
Ligating a Bleeding Epigastric Artery:

The PSSST can also be used to ligate a bleeding superior or inferior epigastric artery through which a port has been inadvertently passed.

The PSSST is inserted through that port site and the dotted orientation line placed to one side of the bleeding point. The needle and suture is inserted into the abdominal cavity as above and the needle withdrawn. The trocar is revolved so the dotted line lies at the other side of the bleeding point and the needle reinserted to retrieve the end of the suture. The suture is now around the offending artery and when the knot is tied the bleeding will stop. The other end of the artery at the opposite side of the port site may require ligating similarly.

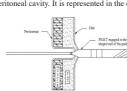
The Port Site Suture System Trocar (PSSST) can also be used for repairing an established port site hernia. This involves the production of an instrument that can pass down a 5mm port which is effectively a

narrow rod with a cup shaped end to guide trocar into the abdominal cavity through the hernia site from within the peritoneal cavity. It is represented in the diagram below: Alternatively the end of a sucker could be used as the guide.

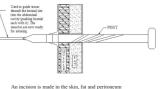




Having inserted the laparoscope well away from the port site hernia to be closed, a 5mm is inserted into the abdomen as far away from the port site hernia as reasonably possible above instrument is inserted into the 5mm port and pushed into the hernia. The cup shap can then be felt through the abdominal wall. to reveal the cup shaped end. The tip of the trocar is inserted into the cup shaped end.



with the cup shaped End, pushing the hernial sack back into the abdomen. The trocar is then in place to suture the hernia site as



An incision is made in the skin, fat and peritoneum to reveal the cup shaped end. The tip of the trocar is inserted into the cup shaped end.