

An Innovative Technique of Laparoscopic Knot Tying

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Study Aim:

To introduce an innovative laparoscopic knot tying technique using loop knot guide or needle knot guide designed for extracorporeal knot tying and using needle holder for intracorporeal knot tying to be ergonomically more suitable than traditional knot tying techniques for minimally invasive surgery.

Design:

A qualitative, explanatory research design is used to describe a new technique of laparoscopic knot tying using our self-designed loop and needle knot guide devices for extracorporeal knot tying and using needle holder for intracorporeal knot tying.

Setting:

Laparoscopic simulator trainer laboratory was used to examine different techniques of knot tying. No human or animal subjects were used.

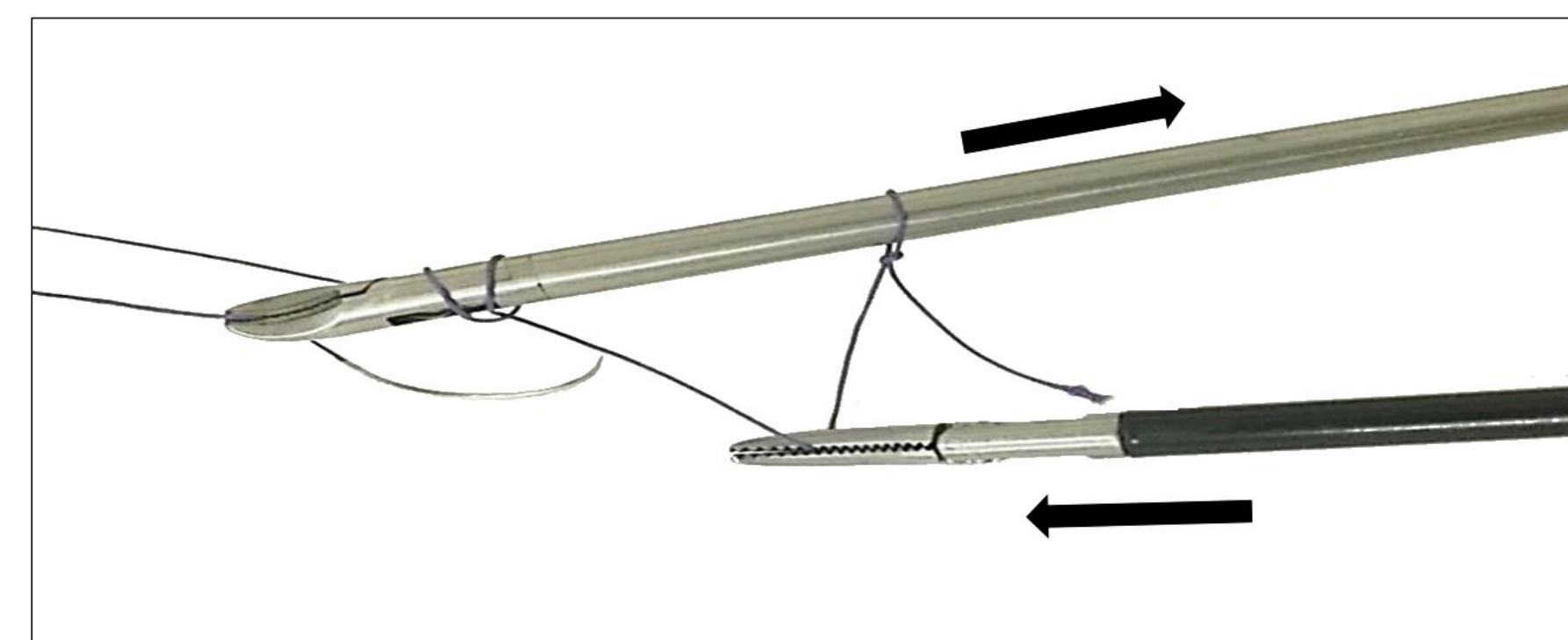


Figure 1. Intracorporeal knot tying

Educational videos:

- [Radfar's Laparoscopic Intracorporeal knot tying technique](#) – YouTube
- [Radfar's Laparoscopic Extracorporeal knot tying technique](#) - YouTube

Technique:

Intracorporeal knot tying: Working end of suture is casted in form of capsized configuration of the slip knot, on the shaft of needle holder before it is introduced into the body for intracorporeal suturing. Slip knot is formed by pulling the needle end of suture through the casted working end.

Extracorporeal Knot tying: Working end of suture is casted in form of capsized configuration of the slip knot, on the shaft of an appropriately sized self-designed loop or needle knot guide and the standing end is pulled through the casted working end of suture by using loop or needle knot guide, to form a slip knot extracorporeally. The knot is slid on standing end by knot pusher to the site where knot is to be applied.

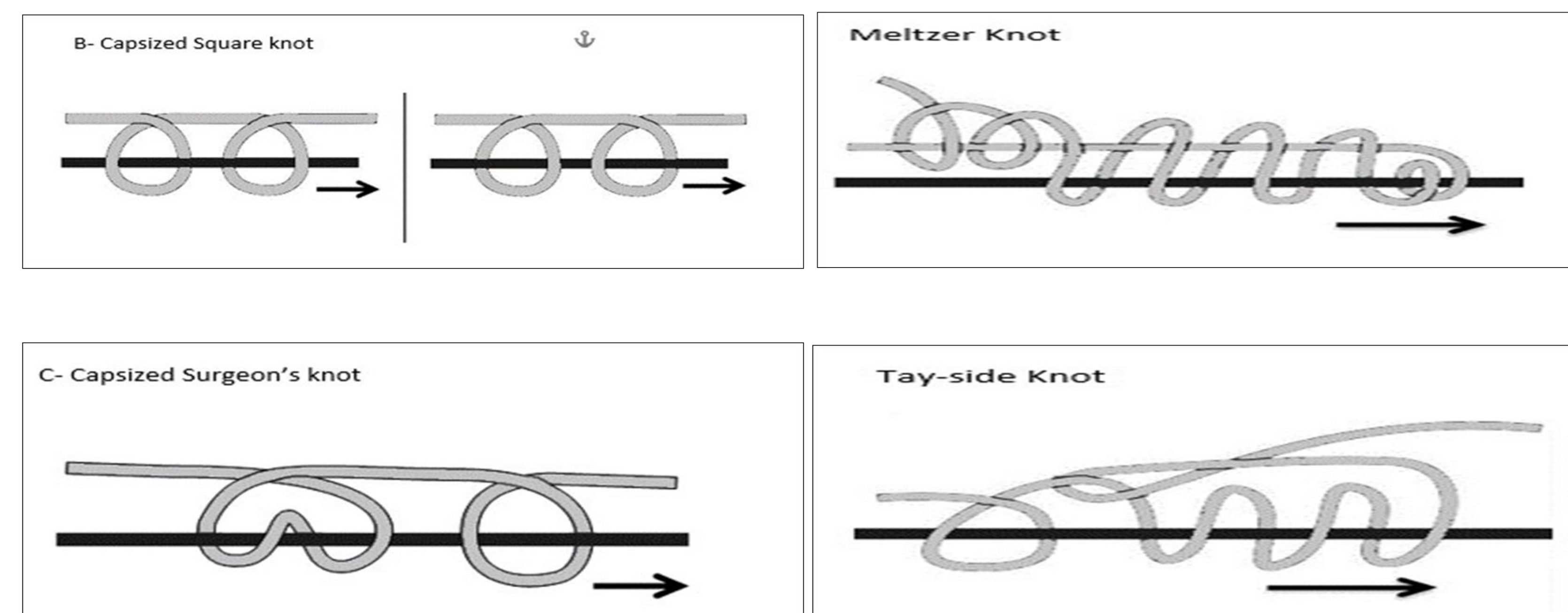


Figure 2. The diagrammatic representation of capsized configuration of few common knots used in laparoscopic surgery.

Result:

Using the innovative laparoscopic technique we achieved:

- Accurate knot reproducibility, security and stability.
- Least amount of suture material is used in forming the knot so it decreases risk of foreign body reaction in patient's tissues.
- Taking into consideration the ergonomics of laparoscopic surgery, this technique reduces fatiguability and trauma to surgeon.
- It also facilitates reduction of the angle between the working instruments while knot tying, so ports could be placed closer to each other, even single port laparoscopic knot tying is possible with this technique.
- It reduces instrument movements intracorporeally while applying the knot hence it decreases risk of trauma to patient.

Conclusion:

Our innovative laparoscopic knot tying technique is an ergonomically suitable and simplified technique for laparoscopic knot tying, reduces related trauma to surgeon and reduces iatrogenic effects to patients

Resource:

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