

## NEW INSTRUMENTATION & TECHNIQS TO SIMPLIFY ENDOSUTURING DURING OPERATIVE LAPAROSCOPY

PRAKASH TRIVEDI ● AMRISH WARTY

### SUMMARY

In spite of major advances in Laparoscopic surgeries, there is not much development to simplify Laparoscopic Suturing. The authors have devised a simplified Laparoscopic suturing technic which was effectively used in 138 cases of advanced Laparoscopic surgeries including laparoscopic hysterectomies, myomectomies etc. This technic needs a specially designed suture material carrier, a simplified knot and a special knot pusher. All these equipment are cheap, can be reused and utilize even free suture material like linen and catgut with the same comfort as Vicryl, PDS etc. This new technic has made laparoscopic suturing look as elegant and secure as open surgery. No major complications or technical difficulties were encountered with this technic which is very easy to learn.

The technic is predominantly extracorporeal however is much faster than most of the existing intracorporeal or extracorporeal technics.

### INTRODUCTION

Nothing increases the potential scope of Laparoscopic Surgery more than the acquisition of the skill to confidently tie surgical knots down the laparoscope. The

aim of all laparoscopic suturing technics is to ligate major blood vessels and tissue pedicles with same degree of security as would be acceptable with open surgery. Inability to do proper suturing leads the Endoscopist to resort to other costly or less satisfactory alternatives like coagulation, clips, endo GIA with their

*Dept. of Obs. & Gyn., Rajawadi Municipal Hospital,  
Mumbai.*

*Accepted for Publication on Nov' 96*

uncertainties of secondary bleeding and occassionally leaving large defects unsutured.

Semm (1986) described and introduced the endoloop which was popularised later by Topel HC. and was followed by other loop versions like surgitie by Osten D.O in 1992. This however was useful for mobile pedicles only.

A simplified technic for Laparoscopic suturing was devised by Dr. Courtney Clarke in 1972 using a knot pusher, which was rediscovered in 1992 by Harry Reich. Harry Reich also devised a method of introducing any curved needle into peritoneal cavity through a 5mm secondary port.

In 1993, Dr. M. AI Fallouji described different types of knots (reef, Hangman, Fisherman's Mid Shipmans hitch etc.) which can be utilised for laparoscopic surgeries. Thus various approaches have been adopted forendoscopic suturing and devising methods of making manual laparoscopic ligatures could provide a simple, cheap and a readily available alternative to the endoloops which are frequently not available or costly.

The authors have designed a different but simple knot, knot pusher and an instrument to make laparoscopic suturing look as elegant and easy as open surgery. This technic was used in 138 cases of advanced laparoscopic surgeries including laparoscopic hysterectomies. These technics have helped us to do extensive laparoscopic surgeries without any compromise and also curtailing the cost of the operative procedure.

#### **MATERIAL & METHODS**

As there is not much of literature review of laparoscopic suturing, we would briefly highlight the suturing techniques and then

explain the technic which we have designed alongwith the advantage and limitations of each technic.

#### **ENDOLOOP**

This is a readymade pretied Roeder's knot with a loop to go around structures desired to be tied. This is useful for mobile pedicles and vessels. For hemostasis three loops are recommended. It must be noted that this technic cannot be used when both the ends of tissue are attached. They are costly and usually not available.

#### **EXTRACORPOREAL ENDOSUTURING**

In this technic suture material is attached to a straight or ski shaped needle and is introduced through small trocar, the suture passes through the tissue like uterine pedicle etc. and the free ends of the sutures are tied extracorporeally after removing the needle. The knot is pushed by knot pusher and usually Roeder's knot is preferred. A surgeons knot is avoided as it doesn't slip easily.

A simplified method for laparoscopic suturing was described by Clarke (1972) and rediscovered by Reich et al (1992). This technic allows, insertion of larger curved needle and simple half hitches are pushed four times with Reich - Clarke knot pusher to have simple secured knot. This technic needs valveless trocar to avoid entrapping of suture material in the valves. Reich et al have designed a method of insertion and removal of curved needles through 5 mm port.

#### **INTRACORPOREAL SUTURING**

Here the knots are tied in the peritoneal cavity i.e. intracorporeally. However this involves series of movements to have needles suture material in peritoneal cavity then with needle holders to go through desired

tissues and finally tie the knots with the needle holder. This is very time consuming exercise and quite often frustrating.

Considering the limitations of the above technics, the authors have designed simple and cost effective method of laparoscopic suturing which is predominantly extracorporeal and easy to learn.

For this method any suture material is acceptable viz. linen, catgut, vicryl etc. This technic requires specially designed Trivedi's suture carrying instrument (5mm), Trivedi's simplified hangman knot and Trivedi's knot pusher (5mm) used through valveless small trocars.

Trivedi's suture material carrier (fig. 1) takes free thread and doesn't require

alternatively taken with 5 mm Maryland's forceps. The suture goes around the desired structure and two free ends come out from the same valveless trocar (5mm).

A simple modified Trivedi's knot (fig. 2) is made and is pushed with Trivedi's knot pusher (fig. 3). Two such ligatures are enough for hemostasis and tissue can be cut and seperated. With these technics one can use even linen as effectively as vicryl or PDS for suturing. Further the cost of knot pusher and suture material carrier is very cheap and it can be reused.

With this suturing technic 138 advanced laparoscopic surgeries were performed including :-

DR. TRIVEDI'S SIMPLIFIED EXTRACORPOREAL KNOT

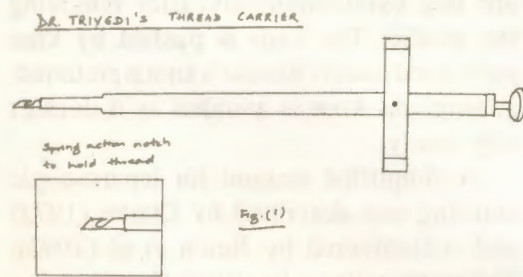


Fig. 1

a needled suture material. This would clearly bypass the entire complicated chronology of having the needle in peritoneal cavity negotiating through tissues and removing the needle from cavity. The instrument is like a curved Maryland forceps with a small slot to lead suture material. The instrument pierces tissues like broad ligament to tie ligature around infundibulopelvic ligament or uterine vessels. A free tie can be

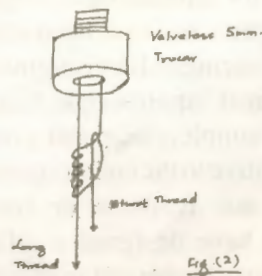


Fig. 2

DR. TRIVEDI'S KNOT PUSHER

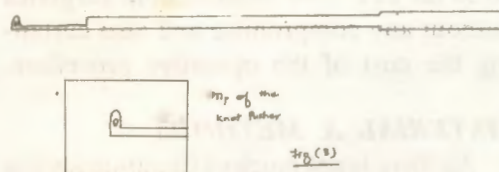


Fig. 3

Laparoscopic Hysterectomy	-	62 cases
Laparoscopic Myomectomy	-	18 cases
Ectopic Pregnancies	-	18 cases
Tubo-ovarian Mass	-	16 cases
Ovarian Cyst	-	21 cases
Cuffed Salpingostomy	-	3 cases

The advantages of these techniques are :-

1. It is easy to learn.
2. It is safe and secure.
3. It is very cheap since linen, catgut or any other material can be used.
4. Only few instruments are required.
5. Can be performed through 5mm ports.
6. Quicker than other intra or extracorporeal technics.

The only limitation is longer length of suture material is needed (since the technic is extracorporeal).

Out of 138 cases there were problems in only 3 cases :

- (a) Once there was bleeding when the suture material carrier punctured a small bleeder (controlled easily by bipolar cautery).
- (b) Technical difficulty in sliding the knot in one case were that the thread were cut and an intracorporeal suturing was done.
- (c) Thin tissue of the tubal mucosa was torn when the knot was tied tightly.

No major problems were encountered with this technic.

#### CONCLUSION

The authors have devised a simplified

laparoscopic suturing technic which would make endosuturing look as easy as open surgery without adding any expenditure, without the danger to surrounding structures and with absolute security to avoid any postoperative bleeding.

Only two instruments viz. Trivedi's suture material carrier and Trivedi's knot pusher is needed alongwith a simple knot designed by him. This technic was used to secure pedicles for laparoscopic hysterectomy to achieve hemostasis for salpingo oophorectomy, salpingectomy, oophorectomy, typing thick vascular adhesions and closing colpotomy incisions laparoscopically.

These technics were used effectively in 138 cases of advanced endoscopic surgery. The major advantages of this technic were safety, simplicity and costeffectivity with unmatched security. Simplified suturing technics have increased the potential scope of laparoscopic surgery which can now be performed without any compromise making laparoscopic surgery as sure and elegant as open surgery. To the best of our knowledge no such well defined technic has been designed in India and this is one of the pioneering work in this rather difficult field of laparoscopic surgery.

#### REFERENCES

1. Clark HC, *Fertil. Steril.* 73 : 274; 1972.
2. Al Fallouji M. *Surg. Laparoscopy and Endoscopy.* 3 : 6 : 477, 1993.
3. Osten D.O. *Laparoscopic appendectomy. Autosuture Co.* 1-13, 1992.
4. Reich H, Clarke HC, Sekel L. *Obstet. Gynec.* 79 : 143, 1992.
5. Semm K. *Br. Med. Bulletin* 42: 284, 1986.
6. Topel IIC. *Endoscopic suturing and knot tying manual Ethicon* 1-27, 1991.