10.5005/jp-journals-10033-1174
ORIGINAL ARTICLE

Dilip-Sarbani Knot (New Extracorporeal Knot)

Bijan Kumar Mukhopadhyay

ABSTRACT

Knots are very important in the general and laparoscopic surgery. Knots are of two types, extracorporeal and intracorporeal. Intracorporeal knots are difficult while extracorporeal knots are comparatively easy to make, as we make it outside. This new knot (Dilip-Sarbani knot) is an extracorporeal knot. We shall take 20 cm length suture material of prolene, vicryl or catgut. Then we shall take three simple rounds in left index finger. Then we shall mark it as no 1, 2 and 3. Then we shall take no 1 over no 2 and again no 2 over no 3 and lastly no 3 over no 1. Then we shall pull it tightly. The knot is prepared. Finally push the above portion of knot to the target organ for making it tight. If we want to be more secure then we can give one more simple knot. This knot can be used in tubal ligation, in appendectomy or where tubular structure and stump ligation.

Keywords: Extracorporeal, New knot, Dilip-Sarbani.

How to cite this article: Mukhopadhyay BK. Dilip-Sarbani Knot (New Extracorporeal Knot). World J Lap Surg 2013;6(1):15-18.

Source of support: Nil

Conflict of interest: None declared

INTRODUCTION

A knot is a method of fastening or securing linear material like rope by tying or interweaving. It may consist of a length of one or several segments of rope, string, chain strap interwoven such that the line can bind to itself or to some other object—the 'load'. Knots have been the subject of interest for their ancient origins, common uses and the area of mathematics known as knot theory.[1]

Knots are very important in the surgery. The history of knots is as old as and belongs to the era of when human beings first began making weapons for hunting.[2] Archaeological studies indicate that the art of tying knots, which has been most simply defined by the Chinese dictionary Shuo-Wen Chieh-Tzu as 'the joining of two cords', by the Chinese people has a legacy that extends back nearly 70,000 to 100,000 years. The knot was the basis for written and symbolic communication, a method of record keeping and a symbolic representation of meaningful historical events that occurred over time. For instance, events of importance were symbolized by tying of knots; the size or girth of the knot itself was reliant upon the importance of significance of the event being archived. Through the ages, the tying of knots has played an important role in the life of man.

Chinese knots are deeply entwined in folkloric tradition. It is evident that decorative knot work is ripe with symbolic meaning. There are currently 18 basic types of Chinese knots: Including the 'cross knot', 'ring hitch' and the 'Chinese lanyard knot' to name a few. Certain knots, such as the 'mystic knot' pattern with its seemingly endless and repetitive pattern evokes one of the fundamental truths of Buddhism and the cyclical nature of all existence. In essence, knot work serves to create an atmosphere of well-being, good luck and health, longevity and harmony. As gifts, they are emotional, sentimental, and are often keepsakes between lovers and friends.

It was the custom of Roman brides to wear a girdle tied with a square (reef) knot, which their husbands untied on their marriage night, as an omen of prolific offspring. Moreover, it was believed that wounds healed more rapidly when the bandages which bound them were tied with a square (reef) knot.

Most of the ancient civilized nations, as well as savage tribes, were accomplished rope makers. Because rope could have served few useful purposes unless it could be attached to objects by knots, man's conception of the rope and the knot must have occurred concomitantly. Knotted ropes played many important roles in the ancient world, being used in building bridges and in rigging ships. Because rope and knots have been two of man's most useful tools since the dawn of history.

In the first century of our common era, the Greek physician Heraklas wrote a brief essay on how to tie 16 knots and nooses for surgical and orthopedic purposes. It was found that seven of Heraklas' 16 knots and nooses were still applied surgically of late, and that four of these have even been recently rediscovered for such applications. The use of knots for basic purposes such as fastening, recording information and tying objects together is known for thousands of years. As the time progressed, people got to know the use of different knots for different tasks like climbing or sailing. Knots were also considered to have spiritual and religious symbolism in addition to their esthetic qualitie—the endless knot appears in Tibetan Buddhism. The rope manufacturing today is same as rope manufactured 2000 to 9000 years ago–with a twist to the left or right.[3] Catgut is made from the gut of animals and has been in use for many hundreds of years for tying knots. There are some examples of knots preserved that are up to 10,000 years old.

This mythology of knots may have contributed to some surgeon's perception of surgical knots more as an art form, than as a science. For those artisans, the use of methods and materials for suturing is usually a matter of habit,

guesswork or tradition. This approach to suturing has contributed to a growing concern that the knot construction employed by many surgeons is not optimal and that they use faulty technique in tying knots, which is the weakest link in a tied surgical suture. Important considerations in wound closure are the type of suture, the tying technique, and the configuration of the suture loops. When a knotted suture fails to perform its functions, the consequences may be disastrous. Massive bleeding may occur when the suture loop surrounding a vessel becomes untied or breaks. Wound dehiscence or incisional hernia may follow knot disruption. As with any master surgeon, he/she must understand the tools of his/her profession. The linkage between a surgeon and surgical equipment is a closed kinematic chain in which the surgeon's power is converted into finely coordinated movements that result in wound closure with the least possible scar and without infection. The ultimate goal of this linkage is the perfection of the surgical discipline.[4]

In general and laparoscopic surgery extracorporeal and intracorporeal knots has a very important role. Intracorporeal knots are difficult while extracorporeal knots are comparatively easy, as we make it outside. Most of the time we use extracorporeal knot as it is best for the operating surgeon and for the benefit of the procedure also. There are so many extracorporeal and intracorporeal knots. Despite recent advances in both suture welding and knotless anchor technology, knot tying will remain a necessary skill which the surgeon must master when performing suture anchor in laparoscopic surgery. There are an endless number of combinations of knots (sliding versus static, simple versus complex, etc.) and suture types (monofilament versus braided) to accomplish this task.

Common extracorporeal knots in general surgery are Reef knot, Granny knot, Square knot, Surgeons knot and in laparoscopic surgery Roeder's knot (Fig. 1), Meltzer knot (Fig. 2), Weston knot (see Fig. 1), Tumble square knot. Intracorporeal laparoscopic knots are Dundee-Jermin, Aberdin, Tumble square.

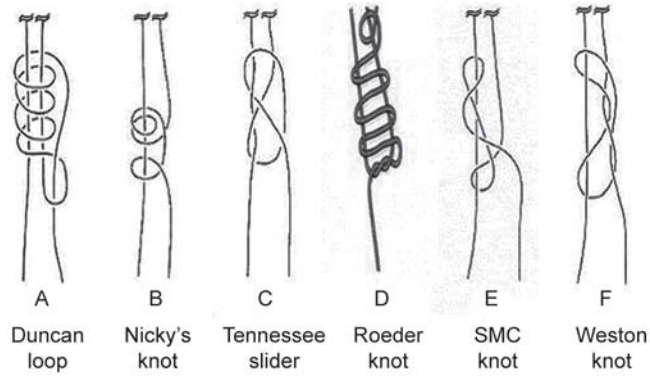

Fig. 1: Commonly used extracorporeal knot (Roeders knot, Weston knot)

Fig. 2: Meltzer knot

Keeping in mind about the knots and their importance in surgeries I am proposing the new knot with many advantages. The new knot is Dilip-Sarbani knot.

It is very simple and gentle knot. It takes very minimal time prepare. No multiple turn and round over suture to make it like in Roeder's, Meltzer's knot and Weston knot even Mishra's knot.

HOW TO MAKE?

We shall take at least 25 cm length suture material of vicryl or chromic catgut or prolene (Fig. 3). Then we should take three simple rounds in index finger of that suture material (Fig. 4). Then we should mark the three rounds as numbers 1, 2 and 3 imaginarily (Fig. 5). Then take no. 1 over no. 2 (Fig. 6) and then again no. 2 over no. 3 (Fig. 7) then again no. 3 over no. 1 (Fig. 8). Then we shall pull it tightly (Fig. 9). The knot is prepared (Fig. 10). Then we shall push the above portion of knot to make it tight. If we need a more secured knot then we can give one more simple knot.

USES OF DILIP-SARBANI KNOT

- It can be used in appendectomy, in tube ligation or anywhere, we want to ligate the stump.
- It is very simple, easy and more secure knot in appendectomy than Roeder's knot and Meltzer knot even Mishra's knot.
- In laparoscopy, we can take the knot through 5 mm port in to the abdominal cavity and with the use of Bhandarkar or Clark knot pusher we can tightly put the knot over the appendix.
- Instead of modified Pomeroy's technique for tube ligation, we can take a bite in mesosalpinx and can put the knot over the loop of the fallopian tube and tightly ligated and cut the loop of tube. In general and laparoscopic surgery, we can use this method.
- For the correction of retroverted uterus, we can tie the round ligament with this method which is more secured.
- During operation to secure the stump, we can use this knot, just after fixing it with some tissue.

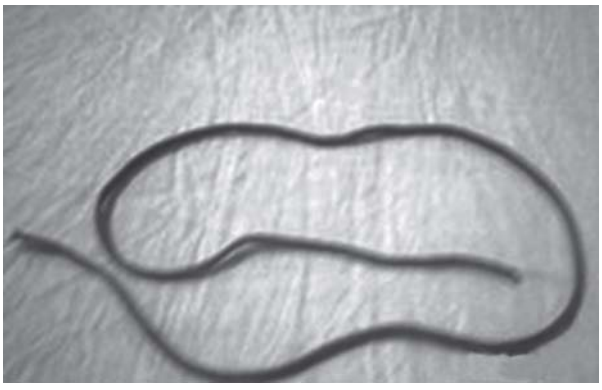

Fig. 3: Suture material

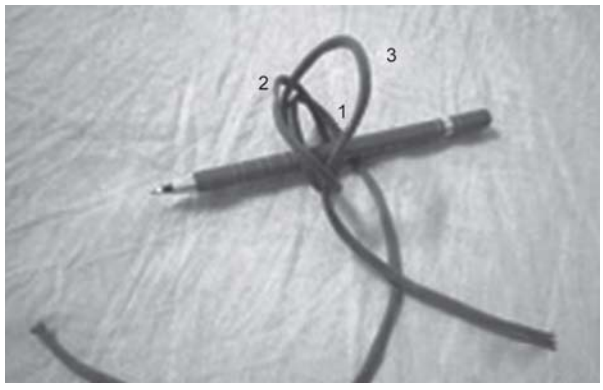

Fig. 7: Take no. 2 over no. 3

Fig. 4: Three simple round over index finger

Fig. 8: Take no. 3 over no. 1

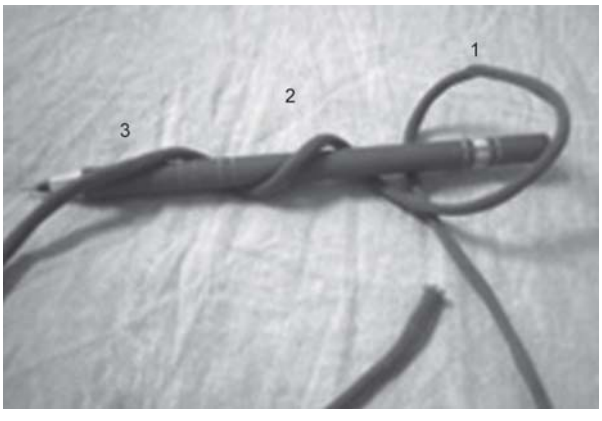

Fig. 5: Make imaginary no. 1, 2 and 3

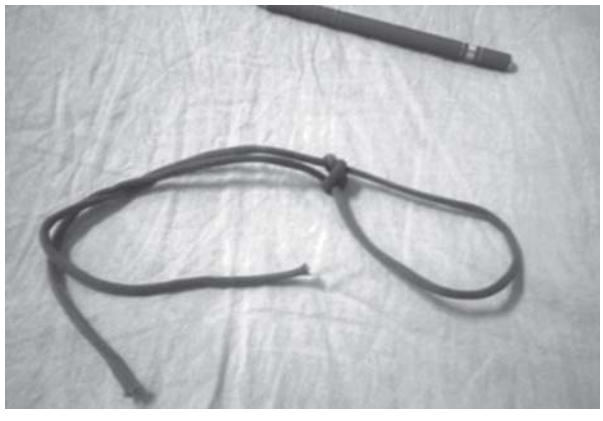

Fig. 9: Pull the knot tightly

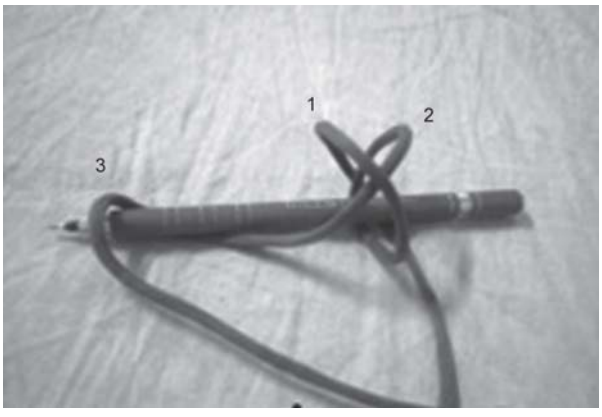

Fig. 6: Take no. 1 over no. 2

Fig. 10: Dilip-Sarbani knot

ADVANTAGES OF DILIP-SARBANI KNOT

- It is probably the simplest knot
- It takes the least possible time to make it
- It can be used in general and laparoscopic surgery
- It is a good hemostatic knot
- It is less complicated so that even a fresher can make it.

CONCLUSION

With above facts in mind it is concluded that Dilip- Sarabani knot will be a highly innovative, easy knot that can be used in general and laparoscopic surgeries. It will be of immense help to surgeons more so to the new people who are starting their profession. It is also my interest to evaluate the efficacy of this new extracorporeal knot which shall form future study aspect.

ACKNOWLEDGMENTS

The author thank Management of MNR Medical College and Hospital for their encouragement and my gratitude to Dr Chitra Patil, Prof and Head, Department of Obstetrics and Gynecology, MNR Medical College; Dr N Bhavani, Associate Professor, Department of Obstetrics and Gynecology, MNR Medical College; Dr Satya Prasad V, Professor, Department of Anatomy, MNR Medical College; Dr Vani Latha, Dr. RK Mishra, Director, World Laparoscopy Hospital, for their support. This knot is dedicated to my parents (Dilip-Sarbani).

REFERENCES

1. Knot. Wikipedia, free encyclopedia. Available from: http://en.wikipedia.org/wiki/Knot.
2. Available from: http://www.theropepeople.com/Indexn.htm.
3. Hage JJ. Heraklas on knots: Sixteen surgical nooses and knots from the first century AD. World J Surg 2008 Apr;32(4): 648-55.
4. Edlich RF, Long WB III. Surgical knot tying manual (3rd ed). Covidien 2008;2-3.

ABOUT THE AUTHOR

Bijan Kumar Mukhopadhyay

Final Year Student, Department of Obstetrics and Gynecology, MNR Medical College, Hyderabad, Andhra Pradesh, India, e-mail: mukhopadhyaybijan@gmail.com