REVIEW

Bali Obstetrics and Gynecology Journal (*BOGJ*) 2025, Volume 1, Number 1: 16-18

Suture Options in Hysterectomy for Gynecological Cases

I Gde Sastra Winata[1*], Garjita Maesa[2]

[1]Obstetric and Gynecologic Departement, Udayana University/Sanglah Hospital, Bali, Indonesia;
[2]Resident of Obstetric and Gynecologic Departement, Udayana University/ Sanglah Hospital, Bali, Indonesia.

*Correspondence:
I Gde Sastra Winata;
Obstetric and Gynecologic Departement, Udayana University/Sanglah Hospital, Bali, Indonesia;
dr.sastrawinata@gmail.com

Received: 2025-04-20
Accepted: 2025-06-09
Published: 2025-06-21

ABSTRACT

Gynaecologic procedures, including hysterectomy, have evolved significantly in recent years. Hysterectomy is one of the most commonly performed surgical procedures for women, typically indicated for conditions such as uterine fibroids, abnormal uterine bleeding (AUB), and pelvic organ prolapse. The choice of suture is crucial in abdominal hysterectomy, with various types of sutures being utilized based on the surgical requirements. Barbed sutures, for example, are commonly used in laparoscopic vaginal cuff closure and other plastic surgeries due to their ability to secure tissue without the need for knot-tying, thus reducing tension along the suture line. These sutures provide secure bites into tissue and distribute tension evenly, making them ideal for procedures that require minimal tissue trauma. Additionally, sutures can be classified as absorbable or non-absorbable, with absorbable sutures often used for deeper wound layers and non-absorbable sutures for superficial layers that are removed postoperatively. The composition of sutures, whether monofilament or multifilament, also affects handling properties and tensile strength. The use of monofilament sutures is favoured in vascular and microvascular surgeries, while multifilament sutures provide greater flexibility and strength for internal procedures. The choice between natural and synthetic sutures further influences the inflammatory response and degradation rate, with natural sutures generally causing more inflammation. Proper suture selection is critical for minimizing complications such as wound dehiscence, infection, and excessive bleeding, thereby improving patient outcomes. Understanding the properties of various sutures allows for better surgical planning and execution, optimizing both immediate and long-term recovery in abdominal hysterectomy.

Keywords: Abdominal hysterectomy, sutures, barbed sutures.
Cite This Article: Winata, I.G.S., Maesa, G. 2025. Suture Options in Hysterectomy for Gynecological Cases. *Bali Obstetrics and Gynecology Journal* 1(1): 16-18

INTRODUCTION

Gynaecologic procedures have evolved considerably in recent years. These procedures can range from cancer staging and debulking to total or radical hysterectomy, unilateral/bilateral salpingo-oophorectomy, omentectomy, lymph node removal, and others.[1]

Hysterectomy has become one of the most frequently performed surgical procedures for women in developed countries. However, the epidemiology of hysterectomy in low- to middle-income countries remains largely unknown.[2] The most common indications for hysterectomy in the United States are uterine fibroids and abnormal uterine bleeding (AUB), followed by pelvic organ prolapse. It may also be indicated for the treatment of symptomatic adenomyosis, endometriosis, cervical dysplasia, endometrial hyperplasia, the surgical management of benign adnexal masses, complete hydatidiform mole in women over 40, and chronic pelvic pain.[3] In general, the dominant surgical approach is abdominal hysterectomy.[2] In this article, we will discuss the types of sutures used in abdominal hysterectomy procedures.

Suture

The word "suture" is derived from the Latin *sutura*, meaning "a sewn seam." In the past, many materials were used for wound approximation, including linen, cotton, horsehair, animal tendons and intestines, and wire made from precious metals. The favourable characteristics of a suture are well-documented and include having the greatest predictable tensile strength within size limitations, good handling properties, and secure knot-tying capabilities. The general purpose of suturing is to approximate tissues without excessive tension, while minimizing ischemia and tissue injury. Suture sizes are commonly denoted using the USP (United States Pharmacopeia) system. Suture sizes increase from USP size 0 to size 1, to size 2, and upwards. Alternatively, suture sizes decrease from 0 to USP size 2-0, 3-0, and so on.[4]

The composition of the suture—whether single (monofilament) or multiple (multifilament) strands—is an important consideration. Monofilament sutures offer lower resistance during tissue passage, are more likely to accommodate organisms, and tend to pull down more readily. The disadvantage is that they must be handled carefully, as they can be weakened or broken by certain instruments. Monofilament sutures are favoured in vascular and microvascular surgery, where ease of tying is crucial. Multifilament sutures offer greater tensile strength, flexibility, and pliability. They are less likely to cause infection, making them the preferred choice for subcutaneous or intradermal sutures and internal surgeries.[4]

Other considerations for suture

Table 1. Characteristics of various sutures[7]

Suture type	Filament type	Tissue reaction	Tensile strength	Absorption (days)	Handling
Absorbable					
Catgut	Twisted	Moderate	Poor	80	-
Polyglycolic acid (Dexon™; Covidien Inc., Mansfield, MA, USA)	Braided or monofilament	Low	Good	90-120	-
Polyglactin (Vicryl™; Ethicon Inc., Menlo Park, CA, USA)	Braided	Low	Good	60-90	-
Polyglactic 910 (VicrylRapide™; Ethicon Inc., Menlo Park, CA, USA)	Monofilament	Low	Good	7-14	-
Polydioxanone (PDS™; Ethicon Inc., Menlo Park, CA, USA)	Monofilament	Low	Greatest	180-120	-
Polyglecaprone (Monocryl™; Ethicon Inc., Menlo Park, CA, USA)	Monofilament	Low	Good	90-120	-
Polytrimethylene carbonate (Maxon™; Ethicon Inc., Menlo Park, CA, USA)	Monofilament	Low	Good	180-120	-
Non-absorbable					
Surgical silk	Braided or twisted	High	Low	-	Good
Nylon	Monofilament	Low	High	-	Poor
Polypropylene (Prolene™, Ethicon Inc., Menlo Park, CA, USA)	Monofilament	Least	Good	-	Poor
Polyester (Mersilene™, Ethicon Inc., Menlo Park, CA, USA)	Braided	Low	High	-	Good
Polytetrafluoroethylene (Gore-Tex®, W.L Gore Associates, Inc., Newark, DE, USA)	Monofilament	Low	High	-	Excellent

selection include whether the suture is absorbable or non-absorbable. Absorbable sutures are typically made from mammalian collagen, which is digested by body enzymes, or synthetic polymers that undergo hydrolysis. Hydrolysis produces a lesser degree of tissue reaction compared with enzymatic degradation. Tissue reactions can cause tensile strength to be lost too quickly, leading to wound dehiscence. Non-degradable materials, on the other hand, involve fibroblasts that encapsulate the suture through fibrous formation.[4] Absorbable sutures are usually used for buried sutures that approximate deep wound edges, while non-absorbable sutures are commonly placed superficially and are eventually removed. Rarely, non-absorbable sutures may be used for deeper structures requiring prolonged support.[5]

Absorbable sutures can also be classified as natural or synthetic. Natural sutures are derived from purified animal tissues (usually collagen) and are sometimes made from the serosa of bovine intestines. Silk and catgut (made from sheep submucosa) are types of natural sutures. Natural sutures differ from synthetic sutures in that they degrade (if absorbable, such as catgut) by proteolysis, whereas synthetic sutures degrade by hydrolysis. Hydrolysis causes less inflammation than proteolysis, which is why natural sutures are often associated with more inflammation at the suture site. Catgut sutures can be treated with an aldehyde solution to strengthen the material (plain catgut sutures) or treated further with chromium trioxide (chromic catgut), which also strengthens the material and helps it last longer before absorption.[6]

Barbed Sutures

Barbed sutures are used to provide a secure bite into tissue and distribute tension evenly along the suture line without the need to tie a knot. They are frequently used for laparoscopic vaginal cuff closure, laparoscopic hernia repairs, and certain plastic surgery procedures. Examples of barbed sutures include quill sutures (Angiotech, Vancouver, BC, Canada), Poliglecaprone 25, polydioxanone, nylon, polypropylene, V-Loc sutures (Coviden, Mansfield, MA), V-Loc 90 (glycomer 631), V-Loc 180 (polyglyconate), and V-Loc PBT.[3]

Abdominal Hysterectomy

The hysterectomy begins with the division of the round ligaments. The entire round ligament (and the underlying Sampson artery) is transfixed with a 1-0 or 0 delayed absorbable suture to ensure haemostasis.[3,8] In an article by Hughes D., size 0 Vicryl can also be used.[9] If a hysterectomy is performed along with salpingo-oophorectomy, the infundibulopelvic (IP) ligament is cut. It can be ligated using a 1-0 absorbable suture and then cut with Cooper scissors. To prevent postoperative bleeding, double ligation of the IP ligament is often recommended.[8] If adnexal organs are conserved, both the ovarian ligament and the tube are clamped, cut, and double ligated using the figure-of-eight technique. If salpingectomy is performed, the mesosalpinx is clamped several times, cut, and ligated.[8] When ligating uterine vessels, a 0 delayed absorbable suture is placed at the inferior tip of the curved clamp.[3] The cardinal ligament pedicles are sutured using a 0 delayed absorbable suture with a figure-of-eight technique.[3] In an article by Konishi I., it is described that removal of connective tissue from

the vesicouterine ligament is important to prevent ureteral injury. The cardinal ligament, including the uterine artery and vein, is cut twice until reaching the vaginal fornix. The upper half of the ligament is clamped and then cut with Cooper scissors, needled, and ligated with a 1-0 absorbable suture. The cut end of the uterine artery requires double ligation.[8] The hysterectomy is completed by securing each lateral pedicle with a 0 delayed absorbable suture in Heaney fashion, ensuring purchase of the uterosacral ligament in the second bite.[3] The vaginal stump is sutured with a 1-0 absorbable suture using a 0 Vicryl suture in a Z-figure technique.[3,8,9]

CONCLUSION

Hysterectomy is one of the most frequent surgical procedures, with abdominal hysterectomy being the most commonly performed. Hysterectomy is also a key management approach for gynaecological cancers. The choice of suture in each step of the hysterectomy procedure may affect patient outcomes.

ETHICAL CONSIDERATIONS

Not Applicable.

DECLARATION OF CONFLICTING INTERESTS

The author(s) declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

FUNDING

The author(s) received no financial support for this article's research, authorship, and/or publication.

AUTHOR CONTRIBUTIONS

All authors contributed to data gathering, analysis, drafting, and revising and approving the article regarding this research to be published.

REFERENCES

1. Arora, V. and Somashekhar, S.P. Essential surgical skills for a gynecologic oncologist. International Journal of Gynecology & Obstetrics. 2018; 143: 118–130.
2. Liu F, Pan Y, Liang Y, Liang Y, Zhang C, Deng Q, et al. The epidemiological profile of hysterectomy in rural Chinese women: a population-based study. BMJ Open 2017;7(6).
3. Handa, V. L and Van Le, L. Te Linde's Operative Gynecology. 12th ed. United States: Wolters Kluwer; 2020.
4. Byrne, M. and Aly, A. The Surgical Suture. Aesthetic Surgery Journal. 2019; 39(Supplement 2): S67–S72.
5. Tajirian, A.L. and Goldberg, D.J. A review of sutures and other skin closure materials. Journal of Cosmetic and Laser Therapy. 2010; 12(6): 296–302.
6. Rose J, Tuma F. Sutures And Needles. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 5 September 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK539891/
7. Raghavan R, Arya P, Arya P, China S. Abdominal incisions and sutures in obstetrics and gynaecology. The Obstetrician & Gynaecologist. 2014; 16(1): 13–18.
8. Konishi, I. Basic Principle and Step-by-Step Procedure of Abdominal Hysterectomy: Part 2. The Surgery Journal. 2018; 5(1): S11–S21.
9. Hughes, D. Total Abdominal Hysterectomy. Association of Surgical Technologists. 2007; 4: 157-162.

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