

Clampless abdominal hysterectomy: A case series at Teaching Hospital Peradeniya

C Kandauda^a, W M M P B Wanasinghe^b

Abstract

Objective: To evaluate the Clampless Abdominal Hysterectomy (CAH) technique with regard to its complications, analgesic requirement and average duration taken to mobilize.

Materials and method: This case series included 51 consecutive open abdominal hysterectomies done with the Clampless Abdominal Hysterectomy technique between May 2017 and May 2018. Patient's age, Body Mass Index (BMI), duration of surgery, preoperative and post-operative hemoglobin, pain score on post-operative day 1 and day 2, time to mobilize to chair, time taken for full mobilization and the analgesic requirements of the patients were taken into consideration.

Results: The mean age of the patient population was 53 ± 4.69 years, the mean BMI was 23.7 ± 3.54 kg/m². The mean duration of the surgery was 50.7 ± 7.03 minutes, and it ranged from 75 minutes (maximum) to 40 minutes (minimum). The mean pre-operative hemoglobin (Hb) was 10.6 ± 0.69 g/dl, while the mean post-operative Hb was 9.8 ± 0.66 g/dl. The mean pain score on day one was 6, which ranged from 8 (maximum) to 5 (minimum), while on the day two it was 4, which ranged from 6 (maximum) to 3 (minimum). The mean time duration taken to mobilize to chair was 16 ± 2.10 hours while the mean time taken for full mobilization was 22.3 ± 2.39 hours.

Conclusion: The Clampless Abdominal Hysterectomy is an extremely safe procedure with less complications that may be employed as an alternative to the conventional open abdominal hysterectomy.

Key words: open abdominal hysterectomy, single clamp, benign gynaecological problems

Sri Lanka Journal of Obstetrics and Gynaecology 2020; **42**: 147-156

DOI: <http://doi.org/10.4038/sljog.v42i4.7971>

^a *Consultant Obstetrician and Gynaecologist, Head of the Department, Department of Obstetrics and Gynaecology, University of Peradeniya, Sri Lanka.*

^b *Acting Consultant Obstetrician and Gynaecologist, Teaching Hospital Peradeniya, Sri Lanka.*

Correspondence: CK, e-mail: chamindakandaugynobs@gmail.com

 <https://orcid.org/0000-0001-8727-0406>

Received 1st September 2020

Accepted 1st December 2020



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Introduction

Abdominal hysterectomy is one of the most commonly performed gynaecological operative procedures^{1,2} and majority of the hysterectomies are done for benign gynaecological conditions such as abnormal uterine bleeding, uterine fibroids, adenomyosis, endometriosis and cervical intraepithelial dysplasia etc. It is also used in oncological management of the ovarian, uterine and cervical malignancies². Hysterectomy can be performed abdominally, vaginally and laparoscopically. Although the current trend is for laparoscopic hysterectomy, the place for abdominal hysterectomy is still present especially³ in developing countries such as Sri Lanka. The infrastructure to perform total laparoscopic hysterectomy is not available in all the institutions especially in rural care settings.

With regard to the usage of conventional method of abdominal hysterectomy with the aid of clamps; hemorrhage caused by trauma or slipping and retraction of uterine arteries, ovarian arteries and injury to the ureters are of great concern to the gynaecologist⁴.

This case series describes the Clampless Hysterectomy technique with the objective of evaluating its complications, analgesic requirement and the average duration taken for mobilization.

Materials and method

This case series was undertaken at the Teaching Hospital Peradeniya, Professorial Obstetrics and Gynaecology Unit, Sri Lanka, during the period from May 2017 to May 2018. Patients who have undergone elective abdominal hysterectomy for benign gynaecological conditions were included in this study. Exclusion criteria were abdominal hysterectomies for malignant conditions and complicated surgeries where extensive bowel adhesions were expected.

During this period, 51 abdominal hysterectomy operations which belong to the above mentioned category were performed by the surgeon, who is competent in both conventional technique as well as CAH and has done >3000 cases of conventional hysterectomies.

Informed written consent was obtained from all the patients and all the standard precautions were taken for the procedure, following the World Health Organization (WHO) checklist and careful preparations were done for the surgery.

Preoperative preparation of the patient and anaesthetic technique

The new enhanced recovery protocol for gynaecological procedure improve postoperative recovery and patient satisfaction⁵. Informed written consent was obtained. Preoperative routine investigations and optimization of medical comorbidities such as diabetes mellitus and hypertension have been planned from the clinic level. Patients were seen by the anaesthetist pre-operatively and patients were optimized accordingly. Pubic hair was trimmed. General anaesthesia was the mode of anaesthesia for Clampless Hysterectomy technique.

Surgical technique

After the administration of general anesthesia, the bladder was emptied by the usage of Foley catheter and indwelling catheter, which was kept till the patient mobilized in the post-operative period, in order to reduce bladder injury during the entry into the abdomen. Choice of the incision depends on number of factors. A size of less than 24 weeks' gravid uterus is usually done with suprapubic transverse incision. There is no hard and fast rule for the choice of skin incision. A single dose of intravenous Cefuroxime 750 mg was given at the time of skin incision and skin preparation with iodine based, topical aqueous, antiseptic solution was used to reduce the wound infection rate. Optimal theater conditions were achieved to facilitate the procedure including optimal placement of theater lamps to achieve good visualization of the internal pelvis. Then abdominal and pelvic cavities were evaluated carefully to find out any other concealed abdominal or pelvic pathology.

Uterus was delivered above the skin incision by placing the surgeon's hand into the pouch of Douglas to grasp the fundus and externalize it. When difficulty arises to exteriorize the uterus with the hand, it is externalized with the aid of a myoma screw, especially if the uterus is large or if there are posterior wall adhesions after careful adhesiolysis. Careful attention was paid to avoid bladder, bowel or vascular injury in all the cases.

Long, straight forceps were placed on the broad ligament adjacent to the uterus on either side for maneuvering, to visualize the planes of dissection and vascular pedicles. If myoma screw was placed then it was used for this purpose. Once the uterus was exteriorized, due to stretching, the round ligaments, broad ligaments, infundibulopelvic ligaments were clearly visualized. Two sutures were placed one centimeter apart in the middle of the round ligament [Figure 1(a), Figure 1(b)].

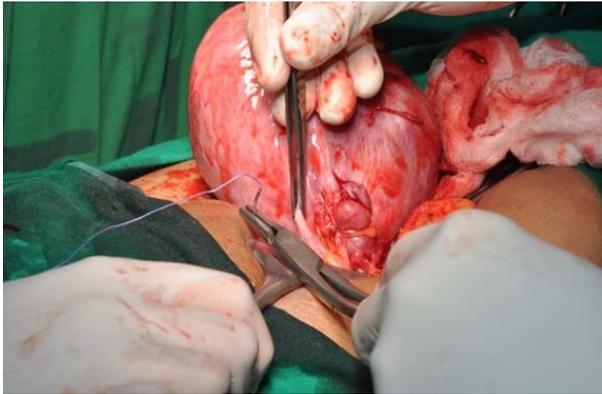


Figure 1 (a).

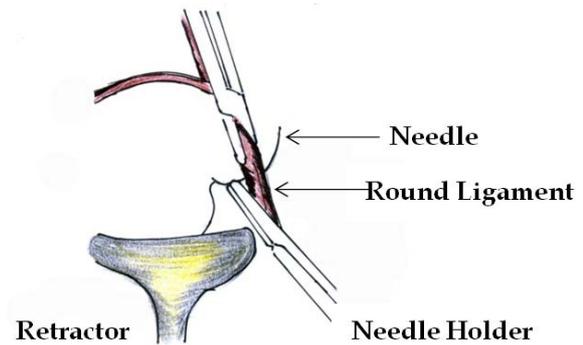


Figure 1 (b).

Then round ligament was incised between two knots. Anteriorly, the incision is extended towards lateral uterovesical fold. Laterally anterior leaf of the broad ligament was incised parallel to the infundibulopelvic ligament towards posterolateral pelvic wall. By this method a window is opened into the lateral pelvic wall. The floor of this window was carefully explored to localize the ureters as ureters can be damaged during ligation of the infundibulopelvic ligament considering its close relationship with the ovarian fossa.

Once the course of the ureter is identified, both index finger and middle finger were placed on the posterior leaf of the broad ligament between infundibulopelvic ligament and ureter (Figure 2). Two stitches were placed one centimeter apart in the middle of the infundibulopelvic ligament (Figure 3). By this technique, inadvertent ligation of ureters can be easily prevented. Incision was made between the two sutures. Then the posterior leaf of the broad ligament is incised up to uterine corpus. The same was repeated on the contralateral site. If the ovaries are to be preserved, two sutures should be placed on the ovarian ligament and dissection should be done.



Figure 2.

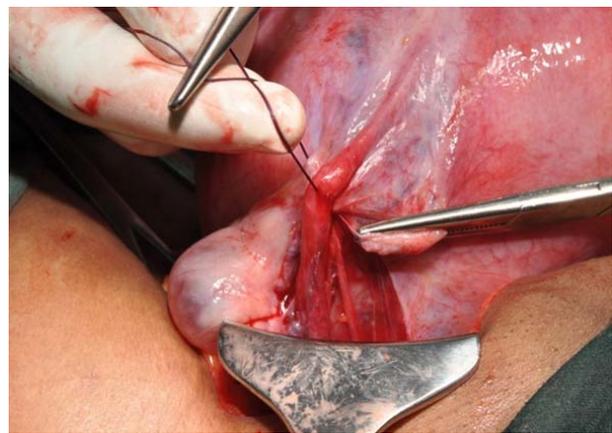


Figure 3.

Salpingectomy was done separately in case of ovarian preservation as this has shown to reduce the epithelial ovarian malignancies.

The bladder peritoneum was raised with tooth forceps, the uterovesical fold was dissected and the bladder was separated from the vagina with a sharp dissection. Bilateral uterine arteries are skeletonized up to the cervico-isthmus junction (Figure 4). Once the uterine artery was identified, a stitch was made by passing the needle anterior to posterior direction under direct visualization hugging the cervical tissues (Figure 5).

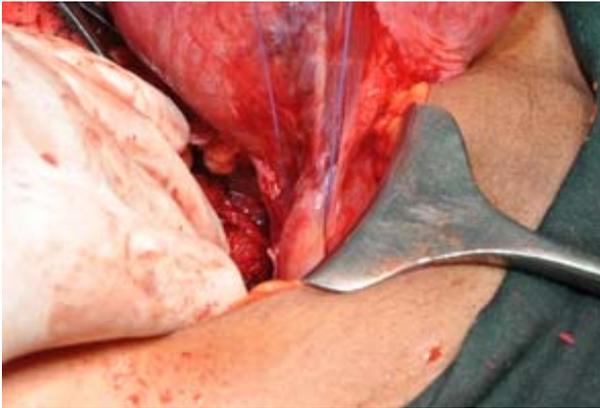


Figure 4.

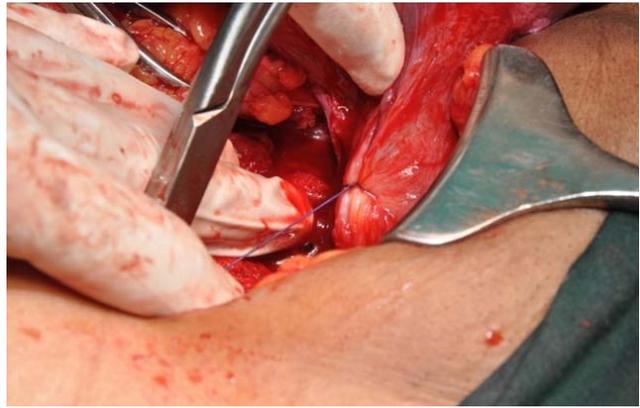


Figure 5.

A suture was placed to ligate the uterine artery. Another suture was placed 1cm above the previous knot. Uterine artery was incised between the two sutures. The same procedure was undertaken on the contralateral side.

Cervicovaginal margin was identified anteriorly by elevating the uterus. A one centimeter length vertical incision was placed over the cervix then extended on to the upper vaginal part (Figure 6 and 7).

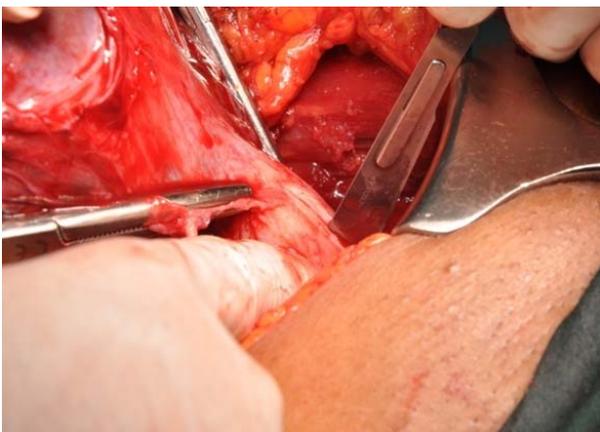


Figure 6.

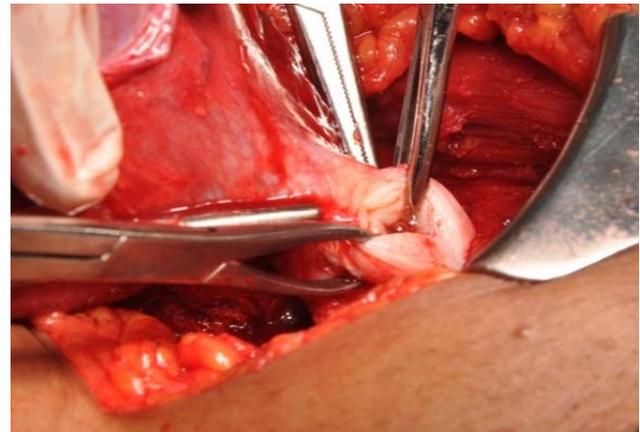


Figure 7.

The vagina was dissected laterally along the vaginal fornix margin, toward the vaginal angle up to 0.5 cm close to the angle (Figure 8). At that point, a hysterectomy clamp was applied to the vaginal wall up to the uterosacral ligament (Figure 9).

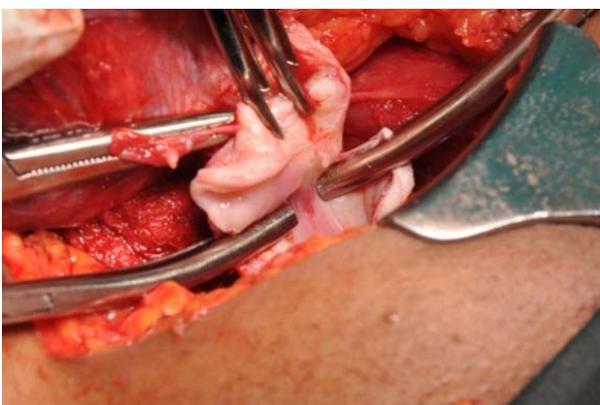


Figure 8.



Figure 9.

The same was done for the contralateral side. Lateral vaginal angles were secured and ligated, and vaginal vault was closed with several interrupted sutures.

Sutures

All the sutures were placed with 1 Polygalactin 910 with 40 mm round body needles. Once the 4 pedicles and vaginal vault was inspected, parietal perineum was closed with 2-0 Polygalactin 910 suture material. Rectus sheath was sutured with 2 Polygalactin 910 sutures in a continuous manner. Fat layer was approximated with 2-0 Polygalactin sutures, in an interrupted manner if the adipose layer thickness was more than 2 cm. All the knots in the fat layer were buried. Skin was sutured with 2-0 Poliglecaprone suture in a subcuticular fashion.

Suture technique

Instrumental knot technique was used for this surgical procedure, which secures the knot with minimal usage of suture materials.

Step 1: Initially the structure, which needs to be ligated is identified and a loop of suture material is placed around the structure.

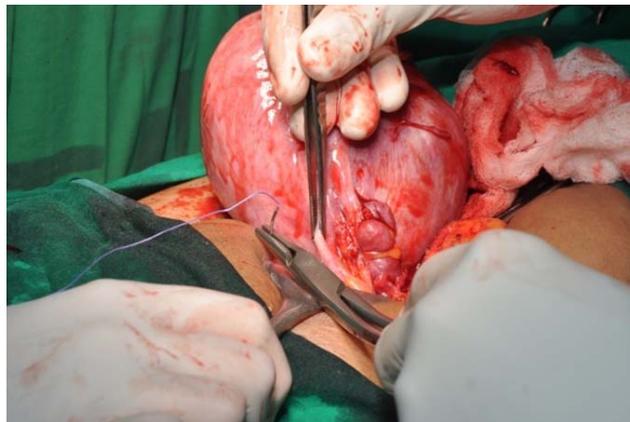


Figure 10.

Step 2: At the top of this loop, a double knot is placed on the index finger of the surgeon while maintaining the adequate traction over the suture material loop.

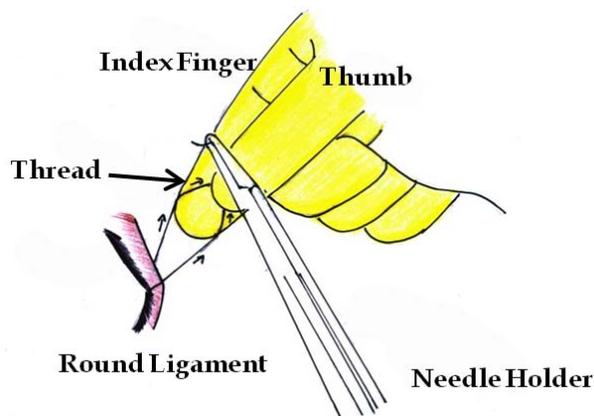


Figure 11 (a).



Figure 11 (b).

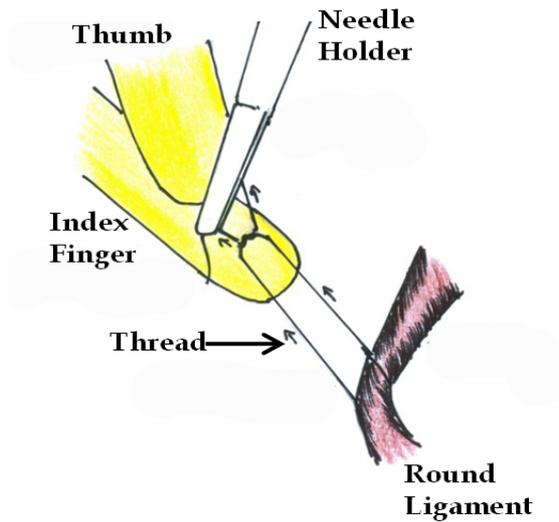


Figure 12 (a).

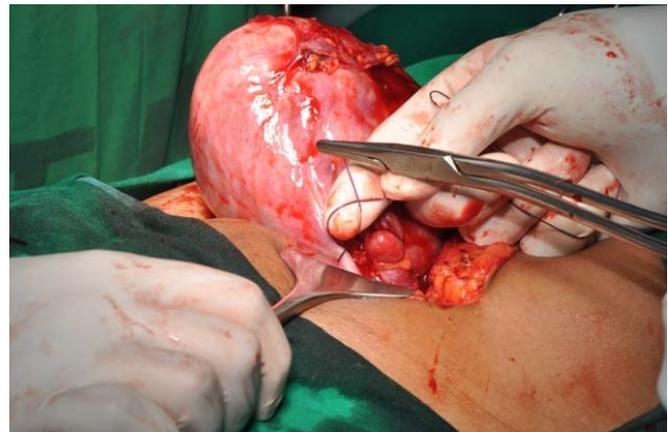


Figure 12 (b).

Step 3: Tension over the knot to both directions



Figure 13 (a).

Step 4: The second knot is placed

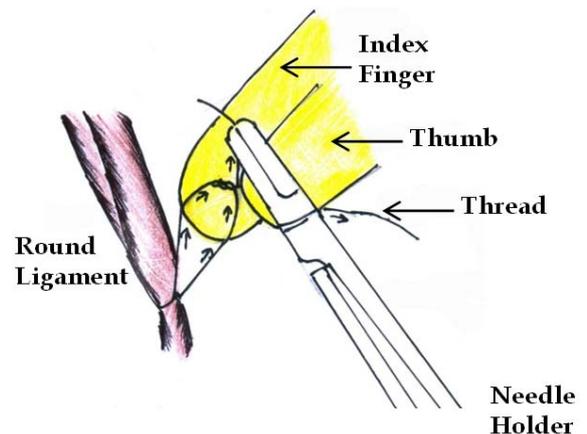


Figure 13 (b).

Step 5: Knot is tightened on to the selected structure and the free end is grasped

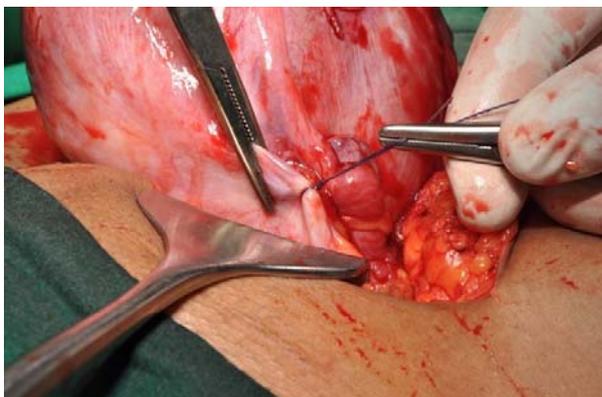


Figure 14.

Step 6: Structure is divided proximal to the knot

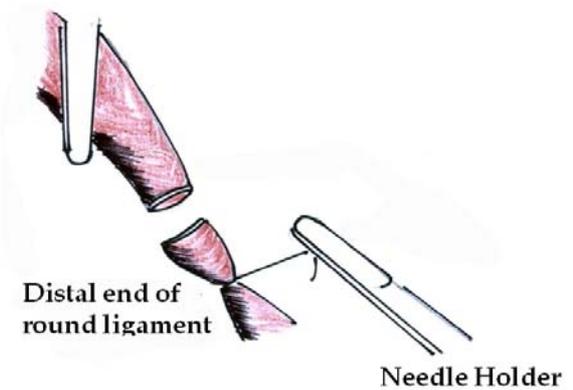


Figure 15.

Results

The study group comprised of 51 women who have undergone hysterectomy. Mean age of the study group was 52.84 ± 4.69 years and the mean BMI was 23.78 ± 3.54 kg/m².

Table 1. Characteristics of the patients

		Frequency (%)
Previous surgery	1 LSCS	3
	2 LSCS	5
	3 LSCS	5
	Laparotomy	4
Parity	Para 2	5
	Para 3	30
	Para 4	13
	Para 5	3

Table 2. Surgical procedures performed

Name of procedure	n=51	Percentage (%)
Total abdominal hysterectomy and bilateral salpingectomy	30	58.82
Total abdominal hysterectomy and bilateral salpingo-oophorectomy	16	31.37
Total abdominal hysterectomy and unilateral salpingo-oophorectomy	5	9.80

n = number

Table 3. Indications

	n=51
Abnormal uterine bleeding with a normal sized uterus	30 (58.82%)
Symptomatic fibroid uterus	
10 weeks size	4 (7.84%)
12 weeks size	2 (3.92%)
16 weeks	2 (3.92%)
Endometriosis	
Grade 1	3 (5.88%)
Grade 2	2 (3.92%)
Carcinoma-in-situ	4 (7.84%)
CIN II	2 (3.92%)
CIN III	2 (3.92%)

Table 4. Operative complications

Injury to	Number	Percentage (%)
Right uterine vessels	2	3.9%
Left uterine vessels	1	2.0%
Right ovarian vessels		Nil
Left ovarian vessels		Nil
Ureter		Nil
Bladder		Nil
Large intestine		Nil
Small intestine		Nil
Omentum		Nil
Pelvic hematoma	2	3.9%

Table 5. Analgesic requirement, pain score and time taken for mobilization

All the patients were given IV morphine and diclofenac suppository on the day of the surgery.

		Number of patients		
		Day 1	Day 2	Day 3
Diclofenac	1 mg/kg	26*	51	51
Pethidine	1 mg/kg IM single dose	21	6	0
Morphine	0.1 mg/kg s/c	24	0	0
Tramadol	50 mg oral single dose	0	9	0

*On day 1, all the patients had one dose of diclofenac suppository. 26 had a second suppository.

Table 6. Pain scores

	Patients – day 1	Patients – day 2
Mild (0-3)	0	3
Moderate (4-6)	39	48
Severe (7-10)	12	0

Day 1 median pain score – 6

Day 2 median pain score – 4

Time taken for mobilization

Mean time to mobilize to chair – 16.22±2.10 hours

Mean time to mobilize fully – 22.28±2.39 hours

Discussion

Abdominal hysterectomy is a commonly performed gynecological procedure for a variety of gynecological pathologies. In the present series, total abdominal hysterectomy and bilateral salpingectomy were performed in most of the cases – 58.8% (n=30) whereas 31.3% (n=16) had total abdominal hysterectomy and bilateral salpingo-oophorectomy, and 9.80% (n=5) had total abdominal hysterectomy and unilateral salpingo-oophorectomy (Table 2). The main indication for hysterectomy was abnormal uterine bleeding (Table 3).

During conventional abdominal hysterectomy with or without salpingo-oophorectomy, clamping, cutting and ligating is employed for the round ligament, infundibulopelvic ligament, ovarian ligament, uterine vessels and utero-sacral ligaments successively⁶.

During the surgical technique with no clamps, the usage of metal instruments is minimal and blind clamping is avoided by greater visualization of pelvic structures and greater visualization with ‘skeletonization’. Avoidance of clamping techniques is done to reduce the extent of tissue damage and to minimize the surgical space required for the surgical procedure.

Rather than vascular pedicle clamping and ligation, individual vessels or vessel bundle is identified and ligated, hence better vessel closure was achieved. Therefore, slippage and retraction of uterine or ovarian artery is less and the additional steps needed to achieve hemostasis were minimal with minimal blood loss (Figure 3, 5). However uterine artery and ovarian artery slippage and retraction are well documented in the literature with the usage of conventional hysterectomy with clamps⁷⁻⁹. Specially where pedicles are friable such as in cases with pelvic sepsis clampless hysterectomy will be of benefit compared to the conventional hysterectomy due to reasons mentioned above.

In conventional hysterectomy procedures, operative complications such as trauma or slipping and retraction of uterine artery and ovarian artery leading to haematoma is very much significant as reported by various authors⁶⁻⁸ from time to time

With regard to the complications, there were only a few cases of uterine vessel injuries and a very few cases of pelvic hematomas (Table 4). During con-

ventional hysterectomy there has been increased incidences of trauma to bladder (1.3%), small intestine (1.1%), omentum (0.7%) and ureter (0.1%). Moreover, if the injuries were not properly handled, it was reported to have increased incidences of haematoma (2.2%) formation which had led to unnecessary further clamping in certain occasions⁴.

When pain scores were analyzed using Numerical Rating Scales, the median pain score of 6 on day one has reduced to 4 on day two with a reduction in analgesic requirement (Table 5). Since clampless hysterectomy is not widely performed, literature regarding pain score comparison with that of conventional hysterectomy is scarce. After the initial study, the author plans for future research in that avenue.

Therefore, the main advantages identified by using this technique are the minimal number of slipping and retraction of uterine and ovarian artery and the consequent minimal blood loss. The number of bladder, ureter and intestinal injuries were minimal and enhanced recovery and reduction in the length of hospital stay was also noted. In developing countries, especially in the rural setting, this technique will be a suitable and safe option for the gynecologists.

Since this case series has demonstrated safety of the Clampless Abdominal Hysterectomy (CAH) technique, further research can be conducted comparing this surgical technique with the conventional abdominal hysterectomy technique.

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