

Research Articles

COMPARISON BETWEEN LOOP DIATHERMY CONIZATION AND COLD KNIFE CONIZATION AT SRINAGARIND HOSPITAL*

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OBJECTIVE :

To compare loop diathermy conization (LDC) with the conventional cold knife conization in term of diagnostic quality of the specimens, cure rate, perioperative and postoperative hemorrhage, operation time and costs of the procedures.

STUDY DESIGN :

A retrospective study was carried out in 104 patients with abnormal cervical cytology or cervical lesions suspicious of carcinoma of the cervix. Cold knife conization were done in 59 patients by staffs and residents of the Department of Obstetrics and Gynecology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand. The diathermy loop were done by the author (PP) and the instrument used was the insulated shaft attached to an insulated transverse arm with 0.2 mm-diameter, 20 mm length, 15 mm width stainless steel wire. The diathermy power was the Ellman Surgitron FFPF radiosurgical

instrument with blended mode and 35-40 W. The procedure performed under local anesthesia in the operative treatre as outpatient visit. The ball-point cautery and/or Monsel solution was used for hemostasis. The cold knife conization were done by staffs and residents of the Department of Obstetrics and Gynecology under spinal or general anesthesia.

RESULTS :

The significant decreased were observed in the loop diathermy group than that of the cold knife conization patients in the operation time, perioperative and postoperative hemorrhage, days of hospitalization and the total costs of the procedures. The dimensions of the specimens from cold knife conization were significantly greater than that of loop diathermy conization. There was no different in the rate of detection of abnormal cervical pathology and quality of specimens as well as the success rate of treatment at 6 months follow-up.

CONCLUSION :

Loop diathermy conization is a reliable, well-tolerated and cost-effective technique for the management of abnormal cervical cytology. This outpatient procedure is recommended for the replacement of the conventional cold knife conization in community hospitals in developing countries like Thailand.

Key words : *loop diathermy, cone, cervix, cytology.*

**Presented at the 11th Asia Pacific Cancer Conference, 18 November, 1993, Central Plaza Hotel, Bangkok, Thailand.*

INTRODUCTION

Cold-knife conization is the acceptable excisional method for histological diagnostic procedure and eventually as a treatment in some case of preinvasive cervical lesion. The procedure was routinely done under spinal or general anesthesia and the patient usually admit to the hospital. It is, however, associated with considerable complications such as hemorrhage which required suturing, rehospitalization or blood transfusion. (1-3) Laser excision conization of the cervix has been advocated in many institutes but the instrument is too expensive for developing countries and still the diagnostic and therapeutic quality is equal to that of cold-knife conization. (4-5) More recently loop excisional diathermy has been introduced with less complications, decreased period of hospitalization, easier technique and satisfactory diagnostic and therapeutic purposes. (6-12) It has been used safely as out-patient conization of the cervix. (13-14)

This study aimed to compare the use of loop diathermy conization (LDC) as out-patient procedure under local anesthesia with the routinely used cold knife conization in term of diagnostic quality of the specimens, cure rate, perioperative and postoperative hemorrhage, operation time and costs of the procedure.

MATERIALS AND METHODS

Between January 1991 and June 1992, 104 consecutive patients underwent conization at Srinagarind Hospital, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand were retrospectively reviewed. All patients were referred to the Colposcopic Clinic in this hospital with abnormal cervical smear or abnormal cervical lesions suspicious of malignancy.

The indications for conization were the extension of abnormal epithelium into the endocervical canal, significant discrepancy among cytology and the histology from colposcopic directed biopsy and/or punch biopsy, suspicious of a microinvasive carcinoma of the cervix or for therapeutic purpose of intraepithelial neoplasia. Fifty-nine patients underwent the conventional cold knife conization and 45 patients underwent loop diathermy conization. The original cytology and colposcopic findings for those two groups were shown in Table 1 and Table 2.

Table 1 Original Cytology

Cytology	Cold Knife	LDC	P-Value
Class	(N=59)	(N=45)	
1	0	1	0.2648
2	4	0	
3	25	21	
4	16	15	
5	14	8	

Cold Knife = Cold Knife conization

LDC = Loop diathermy conization

Table 2 Colposcopic Findings

Findings	Cold Knife	LDC	P-Value
	(N=59)	(N=45)	
Normal	4	0	0.2422
Abnormal	25	16	
Unsatisfactory	29	28	
Miscellaneous	1	1	

Cold Knife = Cold Knife conization

LDC = Loop diathermy conization

Cold knife conization were performed by staffs and residents of the Department of Obstetrics and Gynecology, Faculty of Medicine, Khon Kaen University. All patients were admitted to the hospital as inpatients. The procedure were done under spinal or general anesthesia. The loop diathermy conization were done by the author (PP) as outpatient procedure under local anesthesia. A cusco speculum were used with iodine application for outlining the cervical lesion.

With 5 to 10 ml of 1% lidocaine injected with a 23 gauge needle and gauze syringe under the cervical epithelium at 3, 6, 9 and 12 o'clock outside the unstained region. The diathermy loop used were the insulated shaft attached to an insulated curved transverse arm with 0.2 mm diameter, 20mm length and 15 mm width stainless steel wire. The diathermy power was the Ellman Surgitron FFPF radiosurgical instrument with blended mode and 35-40 W. The loop was started on the anterior part of the cervix perpendicular to the surface as deeply as needed. It was then moved downwards parallel to the surface then withdrawn perpendicular to the surface. After the excision of the cone, Monsel's solution was applied with or without ball diathermy for coagulation. Endocervical curettage was not performed routinely. The patient was allow to go back home after some period of observation with analgesics but without any prophylactic antibiotics. All patients were adviced to observe any potential early and late complications and follow-up 6 weeks later with Pap smear and colposcopic examinations. Additional treatment were given according to the cone pathology.

The following parameters were compared for the two groups: operation time, amount of perioperative bleeding, pain postoperative complications and costs of the procedure. The operation time and the amount of perioperative bleeding were estimated based on the operative notes of the surgeons, anesthesists and the operating room nurses. The number of blood-stained gauze pad were also used to estimate blood loss. The pain were graded as no pain, minimal moderate and severe pain. Severe pain was used when patients needed medication or hospitalization. Postoperative bleeding were grade as no bleeding, spotting for minimal bleeding, profuse bleeding for those who had some degree of bleeding and stayed at home, severe bleeding for those who needed emergency visit and/or hospitalization and/or blood transfusion.

The costs of the procedure were recorded from the ward nurses and the hospital pharmacists. The cone diameters and depth were estimated by the authors and pathologists. The statistics used were chi-square test and analysis of variance.

RESULTS

The average operation time for cold knife conization was 30 minutes while that for LDC was 7

minutes ($p=0.00$) (Table 3). Patients with cold knife group had mean perioperative blood loss of 28 cc and the LDC group 7 cc ($p=0.00$) Due to general or spinal anesthesia, patients with cold knife conization had no complaint of pain but 7 of 45 of the LDC group had minimal pain, 6 had moderate pain and 3 had severe pain and needed analgesics. The average length of hospital stay for patients underwent cold knife conization was 5 days while only 2 patients in the LDC group need hospitalization for one day as the reason of transportation. Two cases of cold knife group and 5 cases of the LDC group had minimal spotting, 2 cases of the LDC group had profused bleeding but stopped after rest at home. No single case of the LDC group had severe bleeding but 3 cases of the cold knife group had profuse bleeding needed hospitalization and another 2 cases needed blood transfusion (Table 4).

Table 3 Operation Data

Data	Cold Knife	LDC	P-Value
	(N=59)	(N=45)	
Operation time (Mins)	29.6±10.5	6.6± 4.0	0.0000
Perioperative blood loss (cc)	27.5±15.9	7.1±16.3	0.0000
Hospitalization (Days)	4.8± 2.2	0.8± 1.4	0.0000

Cold Knife = Cold Knife conization

LDC = Loop diathermy conization

Table 4 Postoperative Bleeding

Bleeding	Cold Knife	LDC	P-Value
	(N=59)	(N=45)	
No	52	38	
Spotting	2	5	
Profused at home	0	2	
Profused, hospitalization	3	0	
Severe need transfusion	2	0	0.0293

Cold Knife = Cold Knife conization

LDC = Loop diathermy conization

The average transverse diameter, vertical diameter and depth of the cone from the cold knife group were 2.7,2.1 and 1.4 cm respectively, while

those of the LDC group were 2.1, 1.9 and 0.9 cm respectively with statistically significant (Table 5). The postcone pathology were shown in Table 6, 5 in 59 patients in the cold knife group and 4 in 45 cases of the LDC group could detect invasive carcinoma. After the reports of cone pathology, 31 patients in the cold knife group (18.6%) and 20 patients in the LDC group (13.3%) had residual tumor of the same grade as the original cone pathology without statistical different (Table 7).

The direct cost for conization evaluated included cost of operation (operation room and anesthetic fees), cost of hospitalization (room and other medication) and costs for complications. The average total cost for the cold knife group was 884 Baht and for the LDC group was only 137 Baht ($p=0.003$) (Table 8).

Table 5 Diameters of Specimens

Diameters (cm)	Cold Knife (N=59)	LDC (N=45)	P-Value
Transverse	2.7±0.6	2.1±0.6	0.0000
Vertical	2.1±0.5	1.9±0.5	0.0157
Depth	1.4±0.5	0.9±0.3	0.0000

Cold Knife = Cold Knife conization

LDC = Loop diathermy conization

Table 6 Postcone Pathology

Pathology	Cold Knife (N=59)	LDC (N=45)	P-Value
Normal	4	1	0.4722
Infection	6	2	
Mild dysplasia	5	5	
Moderate dysplasia	27	1	
Severe dysplasia	8	9	
Carcinoma in situ	23	23	
Microinvasive	2	2	
Invasive squamous	3	1	
Invasive adenoca	1	1	

Cold Knife = Cold Knife conization

LDC = Loop diathermy conization

Table 7 Quality of Specimens after TAH

Specimens	Cold Knife	LDC	P-Value
	(N=31)	(N=20)	
No residual tumor	20	14	0.6850
Residual tumor	11	6	

Cold Knife = Cold Knife conization

LDC = Loop diathermy conization

TAH = Transabdominal hysterectomy

Table 8 Average Costs of Conization

Costs	Cold Knife	LDC	P-Value
	(N=59)	(N=45)	
Cost of operation (B)	362±106	112±46	0.0000
Cost of Hospitalization (B)	477±1163	17±37	0.0090
Cost for complications (B)	45±2879	9±34	0.4056
Total cost (B)	884±1339	137±83	0.0003

Cold Knife = Cold Knife conization

LDC = Loop diathermy conization

B = Thai Baht

DISCUSSION

As cervical cancer is still the most common gynecologic malignancy in Thailand and ranked in the high rate group when compare to other countries (15). Try has been made to overcome the problem including cervical cytology screening program by the National Cancer Institute. With the small number of colposcopist in the country, not all patients with abnormal cervical smear has been referred for colposcopic investigation. The old fashion recommendation for community hospitals is to perform conization in all patients with abnormal cytology as moderate dysplasia and more severe degrees. The pro and cons for the recommendation is to be evaluated. The procedure itself must be done at the operative theatre under general or spinal anesthesia. Postoperative bleeding as reported by Holmskov (1) to be 12.6% to 16.6% and cervical stenosis of 8.1% to 25.5%. Among 915 women reviewed, Luesley found 121 patients (13%) had primary or secondary hemorrhage with 153 (17%) had cervical stenosis and 39 (4%) had subsequent infertility. The early and late postcone hemorrhage in our previous study was 11.1% (3) the Procedure is necessary to be done in well organized hospital with experience gynecologists. To decrease the incidence and mortality rate of cervical cancer in Thailand,

the procedure must be easy and safe and can be performed at small community hospital with low operating cost. With laser excision of the cervix, the complication was low and the specimens were excellent for pathologic examination (4). Comparing two methods of cold-knife conization with laser conization the sizes of the specimens and complications were equal (5). The instrument is more expensive and not applicable for developing countries.

Since Cartier (6) introduced small loop diathermy for excision of cervical transformation zone, the procedure has been developed to be use as large loop diathermy by Prendiville (7-8) and showed it to be a better technique for diagnostic purpose when compared with the punch biopsy technique. Histological examination of the loop specimens, pathologists can make more accurate than that of punch biopsy. With large loop excision of the transformation zone, the diagnostic accuracy approach 100% in most reports. (7-13) It can also be used as the alternative to the routine cold-knife conization with satisfactory histological examination (14-15). As therapeutic purpose, 19 of 616 patients had histologically confirmed persistent of cervical intraepithelial neoplasia with the overall failure rate of 4.4% in Luesley report (9). The therapeutic success rate was 95.5% with one treatment in Gateshead experience (12). At the follow-up time of 6 months, Whitely obtained the rate of normal cytological smear of 95% (10) and at 1 year followup by cytology, colposcopy or histology, Prendiville (7) found only 2 in 111 women had residual or recurrent cervical intraepithelial neoplasia.

This retrospective study confirmed the previous reports (16-17) of the clinical and financial advantages of loop diathermy to cold knife conization. With many major advantages of the procedure such as low hospitalization expense, moderate price of the equipment, safety and easy procedure, good quality of histological diagnosis and high success rate of therapeutic purpose, it is recommended to be used at community hospitals of Thailand and other developing countries.

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