The Use and Maintenance of Instruments for Large Loop Excision of Transformation Zone at Ramathibodi Hospital

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Abstract

The average use of LLETZ in Ramathibodi Hospital from 1993 to 1998 was 73.3 cases per year (range 26-116 cases). The endocervical box (F_2) loop electrode was the most frequently damaged at the rate of 4 pieces per 100 procedures. The damage rate of the 25 mm loop electrode was 3 pieces per 100 procedures and 20 mm loop electrode was 2 pieces per 100 procedures.

The life of the instrument can be prolonged through proper care and continuous maintenance as well as by experienced operators and the assisting team.

Key word : Large Loop Excision of Transformation Zone, Loop Electrode Ramathibodi Hospital

Large Loop Excision of Transformation Zone (LLETZ) is an operation widely used for C.I.N. (Cervical Intraepithelial Neoplasia). It may be adequate not only for diagnosis but also for therapy(1). The instrumentation for LLETZ and its ancillary equipment are delicate and costly requiring proper care and maintenance. Surgical skill and a well-trained surgical team are needed to operate this instrument effectively. Poorly maintained equipment is conducive not only to inefficient utilization but also surgical complications.

In a developing country such as Thailand where spare parts and replacements are hard to come by and where "Cannibalization" of the parts is frequent, regular maintenance and early repair are important in prolonging the life of the equipment and thus, the viability of the health care program(2).

The aim of this study was to assess the damage and replacement of LLETZ equipment at Ramathibodi Hospital over a period of 6 years and to show the price of the parts of LLETZ equipment.

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It is hoped that this data will provide information to the concerned authority to forecast and make available the necessary spare parts and budget so that equipment can be utilized without any financial hindrance. In order to prolong the life of the equipment some of the techniques used for its maintenance are presented.

MATERIAL AND METHOD

This retrospective study included LLETZ procedures performed from August, 1993 to August, 1998 which were obtained from the record book of the Obstetrics and Gynecological operating theater, Ramathibodi Hospital. Data of every LLETZ were recorded by the operations immediately after each operation. Almost all LLETZ were done as out patients as previously described[3]. The data concerning replaced LLETZ equipment was obtained from the equipment records of the operation theaters.

Tabel 1. Use of LLETZ at Ramathibodi Hospital, 1993-1998.

Year	Number	Per cent
1993	60	13.65
1994	26	5.90
1995	69	15.68
1996	116	26.76
1997	105	23.86
1998	64	14.55
Total	440	100.00

The data were presented as the number and damage rate per 100 operations.

RESULTS

A total of 440 LLETZ procedures were performed during the period of study. (Table 1). The amount of damage and replacement of the equipment and their prices are shown in Table 2. The most frequent replacement was the burned-out Endocervical box (F_2) of the loop electrode. They were replaced at the rate of 3.2 per 100 operations. The second was burned-out 25 mm of loop electrodes which were replaced at the rate of 2.5 per 100 operations. Bacterial filter and Charcoal filter were replaced with the same rate of 0.7 per 100 operations. The radiosurgical generator, the smoke evacuator and the open-sided Laser speculum had no report of repair or replacement.

DISCUSSION

LLETZ is used frequently for the management of Cervical Intraepithelial Neoplasia condition. With a properly trained surgical team, the procedure is not only quick but also highly effective[3].

The damage of LLETZ equipment was recorded in a log book after each replacement and repair at Ramathibodi Hospital. The replacement of this sophisticated equipment is costly. The radiosurgical generator is the most expensive at 78,000 baht. The smoke evacuator is 47,000 baht per piece and the Graves open-sided Laser speculum is 9,200 baht per piece. This great expense can be minimised by preventing damage of this expensive and highly delicate instrument. These 3 expensive items were undamaged after over 400 procedures.

Table 2. Parts, replacement rate and price of LLETZ equipment at Ramathibodi Hospital.

Damaged instrument part	Number Rate per 100	Price per piece	Operations (Bahts)
Loop electrode 15 mm.	4	0.9	2,700
Loop electrode 20 mm.	6	1.4	2,700
Loop electrode 25 mm.	11	2.5	2,700
Endocervical Box. F2 (8 mm.)	14	3.2	2,500
Ball electrode D5 (5 mm.)	9	2.0	1,800
Bacterial filter	3	0.7	15,000
Charcoal filter	3	0.7	5,500
Smoke evacuator	0	0.0	47,000
Radiosurgical generator	0	0.0	78,000
Open-side Laser speculum	0	0.0	9,200

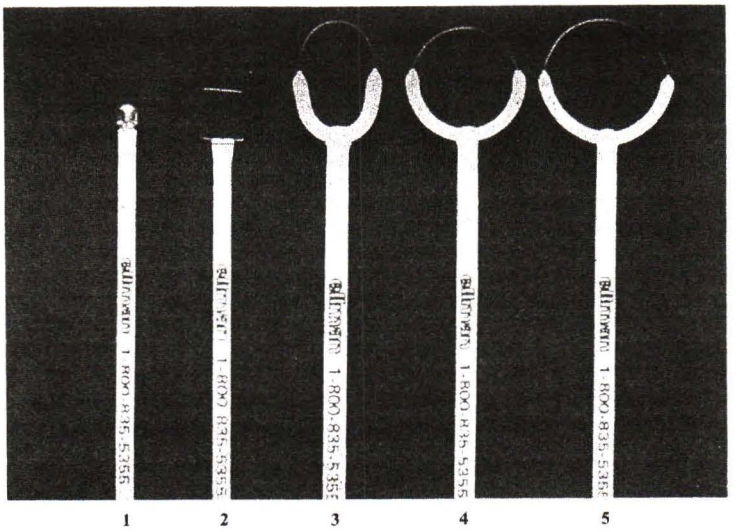

Fig. 1. Standard electrodes.
1. Ball electrode. D_5 (5 mm.)
2. Endocervical Box. F_2 (8 mm.)
3. Loop electrode 15 mm.
4. Loop electrode 20 mm.
5. Loop electrode 25 mm.

As with other sophisticated electronic equipment, maintenanace of the entire equipment system to the functional level requires strict and meticulous training as well as supervision(2).

Proper use and reasonable care will prolong its life and protect its quality. As with any new surgical procedure, a learning curve exists for all members of the surgical team. Education opportunities must be intense initially and must be ongoing so that competency is maintained. Multidisciplinary inservice education should be provided before the introduction of new products. The concept of "training the trainer" works very well. An operating nurse who is responsible for the maintenance, supplies and equipment related to LLETZ surgery is ideal. The nurse should be a member of a multidisciplinary team to assess new products, cost effectiveness, and practice patterns. This knowledge should be reinforced during the orientation of new personnel to the operating room. New personnel learn the basic technique first in general surgery and then proceed to the specialty services, where different instruments and devices are added but the same basic principles of peri-operative practice are applied.

Damage to most LLETZ and its associated equipment can be prevented. The loop electrode which is usually damaged must be used in the correct position and correct size. Users must select from a variety of loop size to excise the suspicious lesion. Smaller loops are generally used for cervical punch biopsy, while the larger loops are used for excision of Cervical Intraepithelial Neoplasia. Users must be educated and familiar with the new equipment. The endocervical box with a small loop and square electrodes is thin and very easily broken. The maintenance team must be very careful. Cleaning should be done after every operation using 3 percent hydrogen peroxide solution to dissolve any residual biological tissue, hardened by heat during operation, remaining on the loop followed by a solution of soft soap on cotton wool or lint.

Cleaning of the Graves open-sided Laser speculum also needs care by washing with water and soft soap and drying with a soft cloth.

The radiosurgical generator and the smoke evacuator do not need to be sterilized, cleaning with a soft wet, cloth after each use and stored in aclean dry room is the only attention needed(4).

It must be emphasized that in developing countries like Thailand, spare-parts are not always readily available locally, especially major components like the electrode system which needs to be returned to the manufacturer abroad for repair or replacement. This process is time consuming and costly. This fact must be taken into account for nation-wide system planning in the stocking of spare parts.

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การใช้และการบำรุงรักษาเครื่องมือในการทำผ่าตัดปากมดลูกด้วยห่วงไฟฟ้า ในโรงพยาบาลรามาธิบดี

วีณา บัลลังก์โพธิ์, วท.บ., พิมพ์สุรางค์ เตชะบุญเสริมศักดิ์, วท.บ., วท.ม.**, มยุรัตน์ วิรัชชัย, วท.บ.*, กำแหง จาตุรจินดา, M.B., Ch.B., F.R.C.O.G.****

LLETZ เป็นการผ่าตัดเพื่อการวินิจฉัย หรือรักษาความผิดปกติของปากมดลูกและมะเร็งระยะเริ่มแรกของปากมดลูกที่นิยมใช้ในปัจจุบันแทนการทำ Conization ระหว่างปี พ.ศ. 2536-2541 ได้มีการผ่าตัดโดยใช้ LLETZ ในภาควิชาสูติศาสตร์-นรีเวชวิทยา คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี จำนวน 440 ราย คิดโดยเฉลี่ยปีละ 73.3 ราย (พิสัย 26-116) อัตราการเสียหายและการทดแทนอุปกรณ์เกี่ยวกับ LLETZ ซึ่งพบว่าห่วงไฟฟ้าขนาด F_2 (8 มม.) ชำรุดเป็นปัญหามากที่สุด ควรมีการเตรียมการด้านอุปกรณ์เพื่อทดแทนในอัตรา 4 อันต่อการใช้ 100 ราย ขนาด 25 มม. พบว่าชำรุดรองลงมา ควรมีการเตรียมการทดแทนในอัตรา 3 อันต่อการใช้ 100 ราย และขนาด 20 มม. ควรเตรียมเพื่อทดแทน 2 อันต่อการใช้ 100 ราย ส่วนประกอบด้านอื่นๆนั้น สามารถป้องกันได้โดยการระมัดระวังในการใช้ มีการตรวจสอบบำรุงรักษาอย่างสม่ำเสมอและถูกต้อง ทำให้สามารถใช้เครื่องมือในการผ่าตัด LLETZ ได้อย่างมีประสิทธิภาพ

คำสำคัญ : การผ่าตัดปากมดลูกด้วยห่วงไฟฟ้า, ห่วงไฟฟ้า, โรงพยาบาลรามาธิบดี

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