A LEEP Cervical Conization Is Rarely Indicated for a Two-Step Discrepancy

Grainger S. Lanneau, MD, Valerie Skaggs, PhD, Kathleen Moore, MD, Sean Stowell, BS, Rosemary Zuna, MD, and Michael A. Gold, MD
The University of Oklahoma Health Sciences Center, Oklahoma City, OK

■ **Abstract**

Objectives. The current indications for conization of the cervix include a 2-step discrepancy between cervical cytological and histological findings. We sought to determine the utility of a loop electrocautery excision procedure (LEEP) cone for a 2-step discrepancy.

Methods. A retrospective institutional review board–approved chart review was performed on all women recommended to undergo a LEEP secondary to a discrepancy between a referral high-grade squamous intraepithelial lesion cytological finding and a subsequent colposcopic biopsy result revealing either normal or cervical intraepithelial neoplasia (CIN) 1 histological finding; CIN 2 was excluded from the study. Statistical analysis was performed using SAS 9 (SAS Institute, Inc, Cary, NC). The results were considered significant if a p value less than or equal to .05 was demonstrated.

Results. Fifty-nine patients received a LEEP for a 2-step discrepancy between cytological and histological findings. Twenty-seven patients had a second pass or LEEP cone. Among the patients with a normal cervical biopsy result and a high-grade cytological finding, 10 (29%) of 34 had normal histological findings, as revealed by LEEP, and 14 (41%) of 34 had CIN 3; 16 (64%) of 25 patients with high-grade cytological finding and CIN 1 biopsy finding had CIN 3, as revealed by LEEP. Compared with patients with an initial normal cervical biopsy result, those with CIN 1 on initial biopsy were more likely to have CIN 3 on their LEEP findings (p = .08). Twenty-seven of 59 patients underwent a LEEP cone surgery; 1 of 27 had CIN 3 finding in the second-pass portion. This was associated with a CIN 3 identified on the first pass and associated with positive margins. The second pass of the LEEP cone failed to demonstrate CIN 96% of the time ($p <$ .0001). Patients with a normal or a CIN 1 finding on the first pass had a normal finding on the second pass in 100% of cases.

Conclusions. A LEEP cone is rarely indicated for the evaluation of a 2-step discrepancy. A randomized trial of this finding is warranted. ■

Key Words: cervical intraepithelial neoplasia, 2-step discrepancy, LEEP cone

Discrepancies or lack of agreement between abnormal cervical cytological and subsequent histological findings are not uncommon and present a unique clinical challenge. These discrepancies may result from an overcall of the cytological finding or from a sampling error at the time of colposcopy. Sampling errors can occur when the high-grade lesion exists in the endocervical canal, occurs on the vagina or on the vulva rather than on the cervix, or when the source of the lesion is on the ectocervix but was missed by the colposcopic biopsy. In cases where the cervical cytological finding is interpreted as high-grade squamous intraepithelial lesion (HSIL) and the histological finding as normal or cervical intraepithelial neoplasia (CIN) grade 1, a cervical conization is recommended. The recommended excisional procedure is designed to find the high-grade lesion presumably missed on colposcopy and, therefore, includes the endocervical canal. The purpose of this study was to address the use of performing the second pass of a loop electrocautery excision procedure (LEEP) cone on patients with a 2-step discrepancy.

Reprint requests to: Grainger S. Lanneau, MD, PO Box 26901, WP 2410, Oklahoma City, OK 73169. E-mail: grainger-lanneau@ouhsc.edu

Journal of Lower Genital Tract Disease, Volume 11, Number 3, 2007, 134–137

MATERIALS AND METHODS

We performed an institutional review board–approved retrospective chart review identifying women recommended to have a LEEP or LEEP cone for a 2-step discrepancy. We defined a 2-step discrepancy as having an HSIL, as revealed by cytological and normal histological examinations, or a CIN 1, as revealed by histological examination. Only those colposcopic examinations thought satisfactory were included in the study. The colposcopic examination was performed in the usual fashion with 5% acetic acid, normal lighting, and Lugol iodine solution to identify the neoplastic lesions of the cervix. All colposcopies and excisional procedures were performed by obstetrics and gynecology residents or by gynecologic oncology fellows under the direct supervision of gynecologic oncology staff.

A LEEP was performed using a typical 15- to 20-mm loop electrode to remove the lesion and/or transformation zone. In addition, the LEEP cone involved the attachment of a loop electrode measuring 10 × 10 mm to remove tissue located deeper in the endocervical canal. The electrosurgical unit was typically set at 60- to 70-W cut, 30-W coagulation, and blend 1. After the tissue was removed, hemostasis was ensured by coagulating the cervical bed at a setting of 60-W coagulation. Monsel solution was then applied to the area to aid in additional hemostasis.

Analysis of the data was performed using SAS 9 (SAS Institute, Inc, Cary, NC). The results were considered significant if a p value less than or equal to .05 was demonstrated.

RESULTS

Sixty-seven patients were identified, 59 of whom underwent LEEP procedure. Eight patients did not follow up for their procedure. Of those responding, 43 (64%) of 67 patients were white; 11 (17%) were Hispanic; 4 (6%) were black; and 8 (12%) were listed as other race. The ages ranged from 19 to 58 years (mean = 26.8; SD = 6.9). The starting age of sexual activity ranged from 12 to 22 years (mean = 16.1; SD = 1.8). Twenty-eight (43%) of 67 patients identified themselves as smokers, whereas 34 (53%) denied current use. Forty (63.3%) of 67 patients were using either injectable or oral contraceptives, whereas 13 (19.6%) used condoms or underwent a bilateral tubal ligation. Fourteen (22%) of 67 patients denied using any form of contraception.

All patients received a LEEP for a discrepancy between an HSIL cytological finding and a finding of CIN 1 or less, as revealed by histological examination. Among the patients with a normal cervical biopsy result, 10 (29%) of 34 underwent a normal LEEP and 14 (41%) of 34 were found to have CIN 3. Sixteen (64%) of 25 of patients with a CIN 1 biopsy finding had CIN 3, as revealed by LEEP. The odds ratio for CIN 1 versus normal histological and subsequent CIN 3 findings identified on LEEP pathological examination was 4.045 (95% CI = 1.122–14.58). The patients were 4 times more likely to have positive results if the histological finding on their case was at least CIN 1.

Twenty-seven (46%) of 59 patients underwent a LEEP cone surgery. These patients tended to be gravid, and most were older than 21 years (these findings, however, were not statistically significant). One (4%) of 27 patients had a CIN 3 finding in the second-pass portion. This specimen also yielded CIN 3 on the first pass of the LEEP and had a positive endocervical margin. The second pass of the LEEP cone failed to demonstrate CIN 96% of the time ($p < .0001$). Patients with normal histological findings or those with CIN 1 identified on first pass had a normal finding on the second pass in 100% of cases (Table 1).

The mean volume of tissue removed for a single-pass LEEP was 3.23 cm^3; for a LEEP cone, 4.24 cm^3. Tissue volume and margin status were compared with patient race, age, gravidity, parity, smoking status, age at first sexual intercourse, number of sexual partners, type of birth control used, and history of sexually transmitted disease. There were no significant correlations.

DISCUSSION

Traditional indications for a cervical conization include unsatisfactory colposcopy, positive endocervical curettage, any suggestion of invasive disease, cytological or histological findings of glandular abnormalities or adenocarcinoma, and a 2-grade discrepancy between

Table 1. LEEP (Transformation Zone) and LEEP Cone (Endocervical Canal)

	Endocervical canal			
Transformation zone	Normal, n (%)	CIN1, n (%)	CIN 3, n (%)	Total (%)
Normal	4 (14.81)	0 (0.00)	0 (0.00)	4 (14.81)
CIN 1	8 (29.63)	0 (0.00)	0 (0.00)	8 (29.63)
CIN 3	13 (48.15)	1 (3.70)	1 (3.70)	15 (55.56)
Total	25 (92.59)	1 (3.70)	1 (3.70)	27 (100.00)

There was no significant association between pathologies, and 100% of those with CIN 1 or less had a healthy endocervical canal.

cytological and histological findings [1]. The management of a 2-step discrepancy remains a clinical challenge. A review of the literature notes an 11% to 16% incidence rate of discrepancy between cytological and histological findings [2] . Inasmuch as cold-knife conization has the highest complication rate among the treatments for CIN [3], most practitioners are using the LEEP procedure, making it the most widely used method for the treatment of cervical CIN [4]. The LEEP was initially developed in 1981 and then popularized by Prendville et al. [5] in 1986. In 1990, Mor-Yosef et al. [6] developed a procedure for cone biopsy using loop diathermy. Later, Duggan et al. [7] conducted a randomized trial comparing cold-knife cone with the loop electrocautery excision cone procedure; thus, they coined the "LEEP cone." They described the LEEP cone as a 2-pass procedure. The first pass removed the transformation zone, and the second pass removed tissue located deeper into the endocervical canal. The authors concluded that the 2 techniques yielded similar diagnostic and therapeutic results. In addition, the LEEP procedure has shown shorter operating times, nonnecessity of general anesthesia, use of smaller specimens, and less blood loss [8].

Determining who will receive a LEEP or a LEEP cone is determined by the responsible surgeon and is often avoided in those patients with low parity and of relatively young age. Although not completely clear in the literature, there is also a theoretical association of inducing preterm birth in women who receive a conization procedure [9, 10].

Interest began in the 1990s to analyze an alternative procedure for the treatment of CIN. In 1991, McCord et al. [11] looked at their findings in women with a 2-step discrepancy. They reported on the cases of 36 patients who underwent cervical conization. Three of the 36 women demonstrated microinvasion. Most studies have demonstrated a much lower rate (1%–2%) of invasive cancer [12]. They concluded that the risk of not diagnosing a microinvasive or an invasive cervical carcinoma far outweighed the risk of conization. Of note, all 3 patients had a depth of invasion measuring 1 mm or less, and only 1 had endocervical involvement. In a morphometric study investigating the location of cervical lesions, it was found that 90% were located within the transformation zone or toward the portio. The other lesions were noted to be located higher in the endocervical canal, especially in women older than 50 years [13].

It is recommended that all discrepancies between cytological and histological findings be reviewed with a pathologist before consideration of therapy because the interpretation of HSIL and CIN 2 or CIN 3 findings are poorly reproducible [14–16]. This may reduce the number of patients with a 2-step discrepancy. For those patients who still have an unresolved discrepancy, an excision procedure is advocated.

Inasmuch as the second-pass portion of the LEEP failed to demonstrate the occurrence of disease in most of our patients, we recommend that the second pass be reserved for those patients on whom the clinician is concerned for endocervical disease. This would include older patients, patients with previous treatment, patients with an unsatisfactory examination on whom fertility is not a concern, and patients with a stenotic os.

Our study, although limited by small numbers and by its retrospective nature, suggests that the removal of the endocervical canal by means of a conization procedure, such as the LEEP cone, is rarely indicated for a 2-step discrepancy. It seems of little therapeutic and diagnostic benefit because CIN 3 was rarely identified on the second pass. Because of the high prevalence rate of finding CIN 3 on the first pass, we continue to advocate the use of a single-pass LEEP in the evaluation of patients with 2-step discrepancies. We hope that these findings lead to a much larger, randomized evaluation.

REFERENCES

1. Wright TC Jr. 2001 Consensus guidelines for the management of woman with cervical intraepithelial neoplasia. *189:295–304.*

2. Bewtra C, Pathan M, Hashish H. Abnormal Pap smears with negative follow-up biopsies: improving cytologic correlations. *Diagn Cytopathol* 2003;29:200–2.

3. Spitzer M, Chernys AE, Shifrin A, Ryskin M. Indications for cone biopsy: pathologic correlation. *Am J Obstet Gynecol* 1998;178:74–9.

4. Ferris DG, Hainer BL, Pffeninger JL, Zuber TJ. "See and Treat" electrosurgical loop excision of the cervical transformation zone. *J Fam Pract* 1996;42:253–7.

5. Prendville W, Davies R, Berry PJ. A low voltage diathermy loop for taking cervical biopsies: a qualitative comparison with punch biopsy forceps. *Br J Obstet Gynaecol* 1986;93:773–6.

6. Mor-Yosef S, Lopes A, Pearsons S, Monoghan JM. Loop diathermy cone biopsy. *Obstet Gynecol* 1990;75:884–6.

7. Duggan BD, Felix JC, Muderspach LI, Gebhardt JA, Groshen S, Morrow CP, et al. Cold knife conization versus the

loop electrical excision procedure: a randomized, prospective study. *Am J Obstet Gynecol* 1999;180:276–82.

8. Huang LW, Hwang JL. A comparison between loop electrosurgical excision procedure and cold knife cone for treatment of cervical dysplasia: residual disease in a subsequent hysterectomy specimen. *Gynecol Oncol* 1999;73:12–5.

9. Klaritsch P, Reich O, Giuliani A, Tamussino K, Haas J, Winter R. Delivery outcome after cold-knife conization of the uterine cervix. *Gynecol Oncol* 2006;103:604–7. Epub 2006 Jun 5.

10. Sadler L, Saftas A, Wang W, Exeter M, Whittaker J, McCowan L. Treatment for cervical intraepithelial neoplasia and risk of preterm delivery. *JAMA* 291:2100–6.

11. McCord M, Stovall T, Summit R, Ling F. Discrepancy of cervical cytology and colposcopic biopsy: is cervical conization necessary? *Obstet Gynecol* 1991;77:715–9.

12. Souter WP, de Barros Lopes A, Fletcher A, Monaghan JM, Duncan ID, Paraskevaidis E, et al. Invasive cervical cancer after conservative therapy for cervical intraepithelial neoplasia. *Lancet* 1997;349:978–80.

13. Abdul-Karim FW, Fu YS, Reagon JW, Wentz WB. Morphometric study of intraepithelial neoplasia of the uterine cervix. *Obstet Gynecol* 1982;60:210–4.

14. Stoler MH, Schiffman M. Interobserver reproducibility of cervical cytologic and histologic interpretations: realistic estimates from the ASCUS-LSIL Triage Study (ALTS) Group. *JAMA* 2001:285:1500–5.

15. Renshaw AA, Davey DD, Birdsong GG, Walsh M, Styer PE, Modt DR, et al. Precision in gynecologic cytologic interpretation: a study from the College of American Pathologists Interlaboratory Comparison Program in Cervicovaginal Cytology. *Arch Pathol Lab Med* 2003;127:1413–20.

16. Grenko RT, Abendroth CS, Frauenhoffer EE, Ruggiero FM, Zaino RJ. Variance in the interpretation of cervical biopsy specimens obtained for atypical squamous cells of undetermined significance. *Am J Clin Pathol* 2000;114:735–40.