

# Investigation of Keyes skin biopsy instrument for cervical biopsy procedures versus Kevorkian biopsy forceps

S. Ayas<sup>1</sup>, İ. Aköz<sup>1</sup>, A. Gürbüz<sup>1</sup>, E. Eskicirak<sup>1</sup>, H. Çetiner<sup>2</sup>, A. Karateke<sup>1</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, <sup>2</sup>Department of Pathology, Zeynep Kamil Women's and Children's Hospital, Istanbul (Turkey)

## Summary

**Objective:** We aimed to investigate the utility and efficacy of the Keyes skin biopsy instrument for cervical biopsy procedures. **Material and Methods:** A prospective clinical trial was conducted on 50 women with cervical lesions. Colposcopy-guided cervical biopsies were collected using a Keyes biopsy punch and a Kevorkian biopsy forceps and the two methods were compared with definitive histopathological examination of the specimens obtained by the loop electrosurgical excision procedure (LEEP), conization or hysterectomy. **Results:** There were no differences in speed of collection, diagnostic value of specimens, complication rates, or sample quality. The sensitivity, specificity, positive and negative predictivity of specimens were all 100% for both methods. **Conclusions:** The Keyes biopsy punch was found to be a safe, rapid and accurate diagnostic tool in cervical biopsy procedures. Based on the results of this study, the use of a Keyes punch instrument can be recommended as an alternative to other cervical biopsy methods.

**Key words:** Keyes biopsy instrument; Cervical biopsy.

## Introduction

Cervical biopsy can be performed by using several types of sharp cervical biopsy punch forceps such as Kevorkian, Tischler-Morgan or Townsend. Although these instruments are used commonly and accepted as safe for cervical biopsy procedures they have some limitations like obtaining adequate tissue samples and destruction of samples during application [1]. We aimed to investigate the utility and efficacy of the Keyes skin biopsy instrument for cervical biopsy procedures.

## Materials and Methods

This study was approved by the Ethics Committee of the Zeynep Kamil Women's and Children's Hospital. Fifty women between the ages of 22 and 49 who had abnormal findings during colposcopic examinations performed because of a low-grade squamous intraepithelial lesion (LSIL) or high-grade squamous intraepithelial lesion (HSIL) in their cervical smears were included in the study. Informed consents were obtained for each patient. During this time period, 7,160 cervical smears were examined: 7,007 (97.8%) cervical smear results were within normal limits. There were 134 cases (1.8%) with LSIL, 31 cases (0.4%) with HSIL, nine cases (0.1%) with atypical squamous cells not excluding HSIL (ASC-H) and 19 cases (0.2%) with atypical glandular cells (AGC), 260 cases (3.6%) with atypical squamous cells of undetermined significance (ASCUS), three cases (0.04%) with ASCUS+ASC-H, six cases (0.08%) with LGSIL+ASC-H, three cases (0.04%) with cervical adenocarcinoma and two cases (0.02%) with invasive carcinoma. Abnormal colposcopic findings included flat acetowhite epithelium, micropapillary or microconvoluted acetowhite epithelium, leukoplakia, punctuation, mosaic, and atypical vessels, and iodine-negative epithelium. In 28 patients with LSIL and 20 HSIL cervical biopsy indications acetowhite

epithelium was found and in two patients with LSIL cervical biopsy indications were atypical vessels. At least two cervical biopsies for each patient using the Keyes skin biopsy instrument (5 mm) and the Kevorkian biopsy instrument for each biopsy were performed. Endocervical curettage (ECC) was added to the cervical biopsy procedure for every patient. To eliminate inter-observer variability, the colposcopy-guided biopsies were performed by the same certificated colposcopist, and examined by the same expert pathologist. Thirty-five patients with LSIL and normal colposcopic findings and three patients with LSIL and abnormal colposcopic findings who did not want to take part in the study were excluded.

Procedure time was calculated in two steps. The first step was when the Kevorkian biopsy instrument was used and the second step the time period when the Keyes skin biopsy instrument was used for the same patient.

Complications have been defined as bleeding that needed suturing to stop or resubmission of a patient because of bleeding after discharge from hospital.

Diagnostic value of specimens and sample quality were evaluated by a pathologist.

## Cervical biopsy technique by using a Keyes skin biopsy instrument

After selecting the biopsy site during the colposcopic examination, the Keyes Punch should be directed straight into the cervix. A tenaculum may be used to fix the cervix. The Keyes Punch can be rotated, rolling it clockwise, then counterclockwise, to assist in penetration through the epithelium. This action will produce a nice core-shaped specimen that is very small, but descends through the full thickness of the epithelium and into the stromal tissues below. The tissue plug is grasped with forceps and elevated slightly above the cervix. Usually, it will still be connected at the base. Scissors can be used to cut across the base, freeing the plug from the stromal tissues. The base of the epithelial defect may bleed some. This bleeding can be controlled with direct pressure for a minute or two or with application of either Monsel's solution (plus direct pressure) or a silver nitrate stick to the base of the defect (and then direct pressure should be applied).

Revised manuscript accepted for publication October 26, 2006

Table 1. — Patient indications for colposcopy (cytology), indications for biopsy (anomalies in colposcopy), pathologic results of the Kevorkian biopsy instrument, pathologic results of the Keyes biopsy instrument, pathologic results of ECC, definitive pathologic results and treatments.

Indication for colposcopy (cytology)	Indications for biopsy (anomalies in colposcopy)	Pathologic results of Kevorkian biopsy instrument	Pathologic results of Keyes biopsy instrument	Pathologic results of ECC	Definitive pathologic results	Treatments
LSIL (n: 30)	30 AWE	4 CIN 3, 2 CIN 2, 17 CIN 1, 7 cases with normal histopathological findings	4 CIN 3, 2 CIN 2, 17 CIN 1, 7 cases with normal histopathological findings	Of 30 ECC patients 2 patients with CIN 3 and 2 patients with CIN 1 had histopathologic findings correlated with HSIL and LSIL, respectively	4 CIN 3, 2 CIN 2, 17 CIN 1, 7 cases with normal histopathological findings	6 cold knife conizations, 24 LEEP
HSIL (n: 20)	18 AWE, 2 AV + mosaic,	2 cervical carcinomas 18 CIN 3	2 cervical carcinomas 18 CIN 3	In 20 ECC 2 patients with cervical carcinoma and 2 patients with HSIL had histopathologic findings correlated with cervical carcinoma and HSIL, respectively	2 cervical carcinomas, 18 CIN 3	2 Type 3 hysterectomies, 18 cold knife conizations, 6 Type 1 hysterectomies

AWE: acetowhite epithelium; AV: atypical vessels.

#### Cervical biopsy technique by using a Kevorkian biopsy forceps

This procedure is performed by conventional methods [2]. All patients in the study group had undergone an excisional procedure, namely LEEP, cervical conization or hysterectomy as appropriate to obtain definite histopathological diagnoses. Histopathologic examination of specimens was accepted as the gold standard and sensitivity, specificity, negative predictive value (NPV) and positive predictive value (PPV) of both procedures were estimated.

#### Results

The mean age of patients was  $35.4 \pm 7.1$  (range: 22-49), gravida  $2.2 \pm 1.7$  and parity  $1.68 \pm 0.7$ . The mean procedure time (first step) using a Keyes skin biopsy instrument was  $30.0 \pm 4.1$  seconds. The mean procedure time (second step) using a Kevorkian biopsy instrument was  $25.2 \pm 3.7$  seconds. A total of 67 biopsies were taken. We took two biopsies in 33 patients: one with a Keyes skin biopsy instrument and one with a Kevorkian biopsy instrument. However we took three biopsies in 17 patients: two with a Keyes biopsy instrument and one with a Kevorkian biopsy instrument. The mean depth of specimens was  $4.4 \pm 0.5$  mm and  $3.4 \pm 0.5$  mm for the Keyes skin biopsy instrument and the Kevorkian biopsy instrument, respectively. All collected specimens were considered as sufficient for pathologic evaluation in terms of sample quality. Moreover no complications were encountered for the two methods. Indications for colposcopy (cytology), indications for biopsy (anomalies in colposcopy), pathologic results of the Kevorkian biopsy instrument, pathologic results of the Keyes biopsy instrument, pathologic results of ECC, definitive pathologic results and treatments of patients are shown in Table 1.

#### Discussion

The difficulties that are encountered during cervical biopsy procedures include backward movement of the cervix due to firm application of the biopsy instrument to the cervix and crushing of the tissue sample due to extra effort to get adequate stroma and visualize the biopsy site [2]. Sometimes a tenaculum is needed to fix the cervix. All specimens were considered as sufficient by a pathologist because adequate stromal depth could be obtained and the transformation zone visualized.

Furthermore, when compared with the ultimate diagnosis obtained by excisional procedures, the sensitivity, specificity, NPV and PPV of the procedures were all 100% with both methods. Therefore the accuracy of both procedures was excellent.

Complications which can occur during cervical procedures as bleeding or infection were not encountered in our study. Moreover the cost-effectiveness of the methods was the same because the two instruments were reusable and could be used several times [3].

Performing biopsies with a Keyes seems a little easier as tailoring the device to a specific target point is possible in almost every instance. Also higher stromal depth can be obtained with the Keyes punch instrument which is another advantage of this method. Additionally lengthening of the handle of the Keyes punch may help manipulation during procedures.

Keats *et al.* used a Keyes punch instrument in open intestinal biopsy procedures in animals and recommended it as an alternative for this kind of procedure [4]. Also Petti *et al.* used a Keyes dermal punch in breast biopsy procedures and proved the usage of this instrument to be safe, quick and reliable in malignant breast disease. A search of Medline showed that there was no

study investigating the role of Keyes punch instruments in cervical biopsy procedures thus far.

Local anesthesia which is needed in some cervical procedures like the LEEP was not an indispensable part of the cervical biopsies that we performed [3]. These procedures in which both instruments were used were well tolerated by patients and no local anesthesia was required.

In conclusion, both the Kevorkian and Keyes skin punch instruments were found to be equally safe, rapid, and diagnostic in cervical biopsy procedures. Based on the results of this study, the use of a Keyes punch instrument can be recommended as an alternative to other cervical biopsy methods.

## References

- [1] Sellors J.W., Sankaranarayanan R.: "An introduction to colposcopy: indications for colposcopy, instrumentation, principles, and documentations of results. Colposcopy and Treatment of Cervical Intraepithelial Neoplasia: a Beginners' Manual". Lyon, International Agency for Research on Cancer, 2003, 29.
- [2] Sellors J.W., Sankaranarayanan R.: "The colposcopic examination step-by-step. Colposcopy and Treatment of Cervical Intraepithelial Neoplasia: a Beginners' Manual". Lyon, International Agency for Research on Cancer, 2003, 37.
- [3] Sellors J.W., Sankaranarayanan R.: "Treatment of cervical intraepithelial neoplasia by loop electrosurgical excision procedure (LEEP). Colposcopy and Treatment of Cervical Intraepithelial Neoplasia: a Beginners' Manual". Lyon, International Agency for Research on Cancer, 2003, 103.
- [4] Keats M.M., Weeren R., Greenlee P., Evans K.L., Minihan A.C.: "Investigation of keyes skin biopsy instrument for intestinal biopsy versus a standard biopsy technique". *J. Am. Anim. Hosp. Assoc.*, 2004, 40, 405.
- [5] Petti D.A., Kemp C.: "Pinça de biopsia dermatologica ("punch"): procedimento diagnostico no carcinoma avancado da mama". *Rev. Paul. Med.*, 1989, 107, 53.

Address reprint requests to:  
S. AYAS, M.D.  
Avsar s. No: 27/10  
34000 Kozyatagi Istanbul  
(Turkey)