

Advantages of radio frequency (RF) cone biopsy compared to large loop excision of the transformation zone (LLETZ) in patients with high-grade squamous intraepithelial lesions: a retrospective study

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Summary

Objective: The aim of this study was to compare radio wave cone biopsy to the LLETZ method in patients with high-grade squamous intraepithelial lesions. **Method-Results:** This was a retrospective study of 186 patients diagnosed with HGSIL who underwent cone biopsy either with the LLETZ method (82/186) or with the radio wave method (104/186) in the 2nd Obstetrics and Gynecology Department, University of Athens, Aretaieion Hospital, Athens, Greece during the period January 1999 to December 2008. The mean age of the patients was 31 years (range 23 to 53 years). The volume of cone ranged from 1.2 x 2 cm up to 3 x 3.6 cm in both techniques. Histopathological analysis revealed focal or extensive high-grade squamous intraepithelial neoplasia extending into the underlying endocervical glands in 128/186 patients. Concomitant low-grade squamous intraepithelial lesions were observed in 160/186 patients and coliocytic atypia was observed in 172/186 patients. The endocervical margins were free of disease in 172/186 cases. In seven cases the neoplastic lesions were at least 0.1 cm from the margin and in seven cases they extended to the margin. In all cases a degree of tissue coagulative change was observed, but not extensive to the point of obscuring the diagnosis. **Conclusion:** 4.0 MHz radio wave surgery is an excellent alternative in the treatment of HGSIL. Clear surgical margins due to decreased heat and tissue damage, controlled hemostasis, faster healing, and patient and doctor satisfaction are notable advantages.

Key words: Yolk sac tumor; Omentum.

Introduction

High-grade squamous intraepithelial lesions (HGSIL) include moderate to severe dysplasia, precancerous lesions, and carcinoma in-situ (preinvasive cancer that involves only the cervical epithelial layer) [1]. High-grade lesions develop most often in women between the ages of 30 and 40, but can occur at other ages as well [1, 2]. Nevertheless, HGSIL on a Pap smear may be associated with malignancy of the cervix. Therefore, a proper diagnostic evaluation is essential [2]. Colposcopic evaluation is necessary when a HGSIL Pap smear is discovered. A biopsy may also be done to determine the amount of abnormality. Possible treatment for HGSIL includes the loop electrosurgical excision procedure (LEEP), cryotherapy, conization (also called cone biopsy) and laser therapy [3, 4].

All treatments directed toward neoplastic conditions of the cervix should be based on a biopsy and not a Pap smear alone. Treatment for a precancerous lesion of the cervix depends on a number of factors which include whether the lesion is low or high grade, whether the woman wants to have children in the future, the woman's age and general health, and the preference of the woman and her doctor. A woman with a low-grade lesion may not need further treatment, especially if the abnormal area was removed during biopsy, but she should have a Pap

test and pelvic exam regularly by a physician with expertise in this area. Treatment for precancerous lesions may cause cramping or other pain, bleeding or a watery discharge. Follow-up consists of regular Pap smears and if necessary colposcopy for an extended period of time.

Radio frequency (RF) is an alternative in the treatment of such lesions with the advantage of free surgical margins. High frequency radiowave energy has a strong affinity for water. Targeted tissue/cell readily absorbs energy due to high water content. Intracellular pressure increases as water molecules expand. Votalization results in cell conversion to vapor. The process emits low-temperature steam which aids in coagulation. Cell-specific interaction enables meticulous dissection with tissue preservation.

We present the results of a comparison made in our Department between two methods of cone biopsy (LEEP and RF).

Materials and Method

A retrospective study was carried out on 186 patients diagnosed with HGSIL who underwent cone biopsy either with the LLETZ method (82/186) or with the RF method (104/186) in the 2nd Obstetrics and Gynecology Department, University of Athens, Aretaieion Hospital, Athens, Greece during the period January 1999 to December 2008. The indications for LEEP were Pap smears indicating HGSIL or repeated cervical smears with LGSIL; 167/186 patients also had cervical biopsies after colposcopy which were positive for HGSIL. We searched our databases regarding demographic data, histopathologic findings

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(free margins or not), postoperative complications (infection, vaginal bleeding, pain, dyspareunia), possible recurrences during the follow-up period, and patient and doctor satisfaction.

All the procedures were done with general anesthesia. Patients were placed in the lithotomy position on the examining table. A proper-size speculum was used and the cervix was painted with Lugol solution. The described RF procedure was achieved by using Ellman Surgitron electrosurgical equipment. The radio wave unit converts electrical current into controlled energy in the RF of the electromagnetic spectrum. A fully rectified current is used to produce a pure, continuous flow of high-frequency current. This filtration and current produce the least amount of lateral heat and tissue destruction. The radio output frequency used was 4 MHz. The generator was set to deliver 60 W at 80% cutoff and 20% coagulation mode. Cone specimens were achieved by using needle electrodes or loop electrodes of 15-20-25 mm depending on the cervical size in order to completely excise the transformation zone. Hemostasis was not necessary as the seeping vessels were cauterized during use. If hemostasis was needed Monsell's solution was used. In all patients vaginal cream (clindamycin) was used postoperatively for a week. Patients were assessed in the evening and were discharged if the pain was tolerable and there were no other complications. Each surgical specimen was evaluated by the pathologist regarding the cone diameter, the depth into the endocervical canal and the surgical margins. All specimens were examined in serial sections clockwise (7-14 mm sections) and in multiple histological levels. All specimens were stained by the hematoxylin-eosin method.

Results

The LLETZ method was performed by gynecologists (13/82) or the residents of the department (69/82) and the RF method was also performed by gynecologists (11/104) or the residents of the department (93/104). Doctors used either needle or loop in both equipment (LLETZ or RF) according to the cervical lesion.

The mean age of the patients was 31 years (range 23 to 53 years). The volume of cone ranged from 1.2 x 2 cm up to 3 x 3.6 cm in both techniques. Histopathological analysis revealed focal or extensive HGSIL extending into the underlying endocervical glands in 128/186 patients. Concomitant low-grade lesions were observed in 160/186 patients and koilocytic atypia was observed in 172/186 patients. The endocervical margins were free of disease in 172/186 cases. In seven cases the neoplastic lesions were at least 0.1 cm from the margin and in seven cases they extended to the margin. In all cases a degree of tissue coagulative changes was observed, but not extensive to the point of obscuring the diagnosis.

There were only three cases of cervicitis. Postoperative bleeding was noted in 4/82 of Group A and in 4/104 of Group B. From the 186 procedures, 172 successfully had safe margins. The follow-up ranged from three months up to one and a half years. Two patients experienced dyspareunia postoperatively. Recurrence rates were 5/82 and 4/104 for the LLETZ and RF group, respectively. There was no need for transfusion. No intraoperative complications were mentioned. No difference was found in the duration of the operation ranging from 5-12 min with a mean time of 10 min. It should be noted that the first in

Table 1. – Comparative findings in two different methods of cone biopsy

	LLETZ	RF
Margins free of disease	78/82	101/104
Thermal	9/82	0/104
Vaginal bleeding	4/82	4/104
Cervicitis	2/82	1/104
Dyspareunia	1/82	1/104

the series conization made by the RF method had a longer duration due to the learning curve. The mean satisfaction rate of the patient and/or surgeon was 100% for both methods.

Discussion

Our retrospective study compares two different methods of cone biopsy. The advantages of the RF cone biopsy is the fact that it is characterized by less blood loss which leads to a more clear operating field and increased visibility. The procedure could be performed with less tissue destruction and so faster healing and quicker recovery could be achieved. It should be mentioned that the low level of the tissue destruction and the controlled direction of the RF current lead to less postoperative pain and chance of infection. In the other group of patients extensive areas of carbonization and epithelial distortion at the margins of the excision were noted. These facts in combination with the small learning curve offer great satisfaction to surgeons working with this modern technique. The above-mentioned findings are similar to the current literature in the field [5-15].

On the other hand, special attention should be paid in choosing optimal power settings and the correct electrode, and ensuring movement with care not to pass too slowly through the tissue in order to prevent increased tissue damage. A contraindication of radio wave procedures is the fact that the method could not be used on patients with older, nonshielded pacemakers due to the high-frequency interference. Such a procedure should not be used in the presence of flammable anesthetics, liquids or skin preparations.

A limitation of our study is the relatively small number of patients who participated in our study. Moreover, the fact that the two methods were performed by different doctors might be a further limitation. Finally, a longer follow-up period may be necessary to achieve safer conclusions regarding the recurrence rates.

Conclusion

RF surgery using 4.0 MHz provides many benefits in the treatment of HGSIL. Clear surgical margins due to decreased heat and tissue damage, controlled hemostasis, faster healing, patient and doctor satisfaction are notable advantages. For this reason, it is proposed to be an excellent alternative in the treatment of HGSIL.

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