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A Comparison Study of Cold Knife and Laser Conization of the Cervix: 10 Years Review

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Objective: This retrospective study was designed to compare the outcome of cold knife and laser cones in the treatment of cervical intraepithelial neoplasia (CIN).

Methods: From 1985 to 1994, 357 patients had undergone cone biopsy for cervical intraepithelial neoplasia. Group A: 213 (59%) patients had a cold knife conization. Group B: 144 (41%) patients had conization by laser. We compared Groups A and B regarding the involvement of the upper and lower margins, glandular extension and compromise of the endocervical canal and a positive endocervical curettage (ECC) after the cone.

Results: In group A, 33 (16%) patients had endocervical margins involved versus 26 (18%) in group B (P=0.57). Ectocervical margin was involved in 39 (18%) patients in group A versus 24 (16%) patients in group B (P=0.78). Glandular extension was present in 54 (25%) patients in group A versus 50 (34%) patients in group B (P=0.14). Positive ECC after cone in 54 (25%) patients in group A versus 9 (7%) patients in group B (P=<0.001). Thirty six patients had post-conization hysterectomy, 22 without residual disease, 13 patients with different degrees of CIN and one for adenocarcinoma in situ.

Conclusions: Laser cone is an easy technique that obtains a specimen as good as a cold knife cone. The residual disease in the uterus was significantly lower with the laser technique when measured by positive ECC after the cone procedure.

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Conization of the cervix continues to be the "definitive" procedure for the treatment of cervical intraepithelial neoplasia (CIN) or high grade intraepithelial lesions (HSIL). The indications for this procedure include the evaluation of patient with unsatisfactory colposcopy, positive endocervical curettage (ECC), cytology suggestive of glandular atypical cells or adenocarcinoma in situ of the cervix, to exclude an invasive adenocarcinoma, the suspicion of an occult squamous carcinoma or microinvasion, and the presence of an unexplained abnormal Pap smear after ruling out vaginal neoplasia. The increasing use of colposcopy in North America has demonstrated that the conization of the cervix is necessary in approximately 10% of the patients.

The surgical technique used to obtain a good specimen has evolved from the initial large cone biopsies done without any help of colposcopy, thus obtaining specimens comparable to amputations of the cervix, to more meaningful specimens obtained under colposcopic guidance. The latter specimens can be obtained with the cold knife, CO2 laser with a scalpel for the upper margin, electrosurgical loop, and the use of an electrosurgical needle combined with a scalpel or tonsil snare instrument[1]. The objective of this paper is to analyse our experience with the use of cold knife conization and conization performed with a combination of CO2 laser and scalpel for the upper margin.

METHODS

Since 1985, we maintained a computerised data base with all the colposcopies performed at the Colposcopy Unit, Health sciences Centre, Winnipeg, Manitoba, Canada. During the years of 1985 to 1994, one of the authors (FG) performed 357 conizations of the cervix among which 213 (59%) patients had a cold knife conization (group A) and 144 (41%) patients had a laser conization (group B).

In group A, the cold knife conization was performed using figure of eight sutures on the lateral aspects of the cervix that during the procedure helped for traction and at the end of the procedure were tied. The specimen was obtained avoiding trauma to the mucosal aspects. ECC was performed after removing the cone and both angles received figure of eight sutures.

In group B, the cone biopsy was performed under direct colposcopic visualisation. Once the depth of at least 1.8 cm was achieved, the upper margin was removed using a scalpel. ECC was performed after removing the specimen and the

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crater of the cone was treated with the CO2 laser. If ectocervical lesions were present and were certain that these were only intraepithelial lesions, the exocervix was treated with laser to a depth of 8-9 mm.

Both types of cones specimens were fixed in formalin and sent immediately to the Pathology department for sectioning and a complete pathology report was issued. The report included an assessment of degree of dysplasia/CIN of squamous epithelium, presence or absence of squamous carcinoma in situ (CIN III)/adenocarcinoma, presence of micro or frank invasion, as well as involvement of endocervical (upper) and ectocervical (lower) margins and glandular extension.

A separate comment regarding presence of any histopathological abnormality in the separately processed endocervical curettage was always included in the report.

RESULTS

In group A (cold knife) 33 (16%) patients had an upper margin involved and in group B (laser cone) 26 (18%) patients had an upper margin involved. The lower or ectocervical margin was involved in 39 (18%) patients in group A and 24 (16%) patients in group B, with a P value of 0.57 and 0.78 respectively. With regard to the glandular extension, 54 (25%) patients in group A had glands involved while 50 (34%) patients in group B had glands involved. The P value was 0.14. A positive ECC was found in 54 (25%) patients in group A and only in 9 (7%) patients in group B. This difference was highly significant (p=<0.001). These results are summarised in Table 1.

Table 1: The results of upper margin, lower margin, glandular extension and endocervical curettage in groups A and B

Type of cone	Upper margin involvement	Lower margin involvement	Glandular extension	Positive ECC
Group A				
Cold knife	33 (16%)	39 (18%)	54 (25%)	54 (25%)
Group B				
Laser cone	26 (18%)	24 (16%)	50 (34%)	9 (7%)
P value	0.57	0.78	0.14	<0.001

The histologic evaluation of the cone specimens showed similar percentage of patients with CIN III (59%) in each group. The total number of patients with histologically proven high grade intraepithelial lesion (HSIL [CIN II and CIN III together]) was 149 (69%) in group A versus 102 (70.8%) in group B. The percentage of cones showing inflammation only after a positive biopsy or endocervical curettage was similar in both groups (11%) with 25 patients in group A and 16 in group B. The percentage of cones with microinvasion was almost identical (16 patients in group A or 7.5% versus 11 patients in group B or 7.6%).

Invasive squamous carcinoma, adenocarcinoma in situ and invasive adenocarcinoma in situ were found in small numbers. All histological results are summarised in Table 2.

Hysterectomy was performed in 34 (8.7% of the total group) patients. Half of them (17 patients) had the hysterectomy performed for microinvasion. The next common reason to perform the hysterectomy was residual intraepithelial lesion or CIN in 7 (20.5%) patients. Only one patient in the whole series required a hysterectomy for post-cone bleeding. A summary of the indications for hysterectomy is shown in Table 3.

Table 2: Histologic results of the cone

Histology	Cold knife	Laser cone
Inflammation	25 (11%)	16 (11%)
CIN I	17 (8%)	5 (3.4%)
CIN II	23 (10%)	17 (11.8%)
CIN III	126 (59%)	85 (59%)
Miroinvasion	16 (7.5%)	11 (7.6%)
Invasion	2 (0.9%)	4 (2.7%)
Adeno Ca in situ	3 (1.4%)	5 (3.2%)
Invasive Adeno Ca	1 (0.4%)	1 (0.7%)

Table 3: Indications for Hysterectomy

Indication	Number	%
Microinvasion	17	50.0
Residual CIN	7	20.5
Adeno Ca in situ	3	8.8
Cancer phobia	2	5.8
Other gyne problem	1	2.9
Post-cone bleeding	1	2.9
Invasive Sq Ca	1	2.9
Invasive Adeno Ca	1	2.9
Invasive Adeno Sq Ca	1	2.9

DISCUSSION

Most of the previous studies focused mainly on the comparison between cold knife laser and conization related to the complications associated with each procedure[2-4]. Some other studies looked at the pregnancy outcome following conization of the cervix[5-7].

We focused on the quality of the specimen and the residual disease. Only a few papers in the literature talked about the residual disease after cold knife conization[8-9]. The use of the CO2 laser to perform a colposcopically directed cone biopsy is safe and provides a very good specimen. In some instances there is a great advantage in using the colposcope while performing the cone since there are extensive peripheral areas with abnormal tissue and these areas can be safely vaporised obtaining a cone specimen mainly dedicated to the study of the endocervix. It is here also that the laser cone seems to have a great advantage over the cold knife conization. The residual disease after the specimen had been removed when measured by the percentage of positive endocervical curettage showed a significant difference between the two groups. The other variables that are important in a cone biopsy (involvement of the upper and lower margins and glandular extension) were not significant.

The two groups studied are comparable in the indications and this can be easily seen by the almost identical percentages of pathology found especially with the high grade intraepithelial lesions.

CONCLUSIONS

In summary and after analysing our results of the two techniques, we consider that laser cone performed under direct colposcopic visualisation and removing the upper

margin with the scalpel is a very useful technique giving a good specimen.

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