Surgical Management of Pre-invasive Lesions of the Cervix

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ABSTRACT The natural history of the low grade lesions is most to spontaneous healing, but can also be to persistent lesions and progression to high grade lesions. Unlike the natural history of LSIL, HSIL has a major potential to progress to invasive cancer. The main goal in the management of high grade lesions must be to remove the entire transformation zone in both surface and depth (7 mm tissue), and that can be achieved either by ablation (laser CO2, criotherapy) or excision (ERAD, cold knife conisation, amputation, hysterectomy). Postoperative complications are rare (1-2%) and are typically hemorrhagic or infectious nature. A small percentage of patients may experience some postoperative sequelae: transformation zone ascend, unsatisfactory colposcopy, cervical stenosis, failure of conization. Obstetrical prognosis is not severely affected after a single intervention, but repeating the procedure may increase risk of infertility and obstetric complications cervico-isthmic (incompetence, premature rupture of membranes, low birth weight, increased neonatal morbidity and mortality due to prematurity).

KEY WORDS LSIL, HSIL, HPV, ablation, excision, outcome

Introduction

The decision to group as HSIL intraepithelial neoplasia second and third degree (CIN II and CIN III) has as a substrate more findings: contain the same cellular changes, the HPV typing detects the same high oncogenic strains as invasive cancer, with high potential to evaluate to invasive cancer.

The HSIL cytological category is predominantly determined by the high grade lesions (CIN II and CIN III 75%), invasive cancer (1.7%) and also less severe lesions (CIN I 16%) and benign lesions (6.5%). [7, 21, 24, 54, 67, 161]

The natural history of the low grade lesions is: spontaneous healing, persistent lesions and progress to high grade lesions (10-20% of cases). [7, 101]

Unlike the natural history of LSIL, HSIL has a major potential to progress to invasive cancer. A study involving 894 patients reveals spontaneous regression of lesions in 54% of cases, persistence in 16% of cases and progression to invasive cancer in 30% of cases, after monitoring the patients for over 50-78 months. The progression rate of CIN III is estimated to 70%. [7, 101]

Irrespective the management, the main goal must be to remove the entire transformation zone in both surface and depth (7 mm tissue), because affected glandular crypts by CIN can stretch up to 5 mm in the cervical stroma. The patients who undergo a surgical management have a ten times higher rate of curing than those without any treatment. [7, 167, 168]

There are two ways of approaching the intraepithelial neoplasia:

- ablation (destruction);
- excision

The excisional techniques have both diagnostic and curative goal (by excision of the lesion and transition zone exposed to the neoplastic transformation risk). It is also possible a histopathological evaluation of excised fragments edges. It can be chosen from one of the following: ERAD, cold knife conisation, amputation, hysterectomy.

Electro-surgery uses electrical energy that is converted into heat. This comes from high-voltage arc between the electric knife (cutting electrode) and tissues. High temperatures allow the cut of the tissue either by vaporization (at 100 degrees Celsius) or by coagulation (over 100 degrees Celsius). The purpose of the procedure is to excise the lesional tissue and the entire transformation zone with subsequent histopathological examination opportunity. That’s why it is used the minimal electric power capable of excision in order to preserve the edges. Power setting depends on the size of the cutting loop electrode used and on the size of the ball used for coagulation [7, 67, 73, 78, 91, 95]

The procedure is performed under colposcopic guidance. Where possible, the lesion must be excised one time, but that is not always possible.

ERAD should not be used if the upper limit of the lesion is not visible and if the distal limit (cranial, endocervical) extends more than 1 cm
into the endocervix. In such cases, cold knife conization is indicated. Hemostasis can be achieved by three types of coagulation:

- desiccation (the electrode touches the tissue)
- fulguration (the electrode does not touch the tissue, but spread more sparks between it and tissue)
- punches (the electrode, usually in the form of arc, is inserted in the middle of the tissue)

It is used coagulation by fulguration with 3-5 mm ball electrode with one exception; electrode-needle in the bleeding area. Fulguration uses smaller current and less tissue destruction. Also, to control hemostasis can be used Monsel’s gel.

Irrigation, intravaginal absorbent and sexual contact are prohibited for a month. [2, 7, 10, 12, 13]

Postoperatively, patients can present a brown - blackish leucorrhea which takes several days to 2 weeks. [2, 8, 13, 15, 21]

Postoperative pain is of short duration and low intensity, during the intervention. Postoperatively, few women report local pain and it appears as cramps (remit to usual analgesic/anti-inflammatory medication).

Immediate complications occur in 1-2% of cases and are typically hemorrhagic or infectious nature. [2, 16, 18, 17]

Severe perioperative bleeding occurs in less than 2% of cases, the rate of occurrence is directly proportional to the magnitude of excision.

Postoperatively, moderate or severe bleeding occurs in 2% of cases usually at 4-6 days after, from posterior lip of the cervix. Hemostasis is achieved by fulguration, Monsel’s solution or silver nitrate; rarely requiring haemostatic suture thread. [2, 6, 19]

The first menstruation may be heavier, in order to achieve the best possible quality scarring, ideal is to program the intervention immediately after the menstrual period.

Infection has a very low risk, which can be minimized by performing surgery only after the PID, cervicitis, vaginitis treatment. Postoperatively, if patients present with smelling leukorrhea should be performed culture and empirical treatment with antibioterapy active in PID. [2]

A small percentage of patients may experience some postoperative sequelae:

1. **Transformation zone ascend** in cervical canal appears in about 2% - 7% of cases because of the electrical arc created in a small field at the tip of the cone. Glandular tissue burning produces fibrous scar losing cylinder epithelium surface secreting mucus, which results in lower cervical glere, lubrication and consecutive ascending cervical canal transition zone. [2]

2. **Unsatisfactory colposcopy** is recorded at a rate of 1.3% - 9% after electroresection with the diathermy loop, the consequence of lifting ZJ in the cervical canal.

3. **Cervical stenosis** is extremely rare in patients who practice the electroresection with the diathermal loop (ERAD), appears in less than 1.3% - 3.8% and is more common in postmenopausal women. The risk of stenosis increases with the height of the cone piece excision, the minimum is less than 2 cm, as respects endocervical cells that are stimulated by estrogen. [2, 14, 20]

4. **Failure of conization** with diathermal loop is quoted to be around 5-30% in persistent / recurrent disease. [4, 6, 8, 10, 12, 13, 15, 21]

Cold knife conization alters the edges of the piece excised at a rate of up to 51%, with the inability to fully assess the edges at a rate of up to 38%. Total alteration edge piece sent to histopathological examination is cited in the literature around the percentage of 1-2%. [14]

5. **Obstetrical prognosis** is not severely affected after a single intervention, but repeating the procedure may increase risk of infertility and obstetric complications.

**Infertility** consecutive to conization is cervical cause either consecutive to stenosis or by affecting the quantity or quality of cervical mucus. Thus, mucus decrease affect the ascension of sperm and processes of selection and capacitation, and qualitative damage causes loss of function of buffer base, vaginal acid zone affecting the viability of sperm and loss of antiseptic barrier role, which has as result local infections with the possibility of lifting, resulting in endometritis.

Most studies and meta-analysis reported a higher risk of obstetric complications in patients who underwent a conization of the cervix: cervico-isthmic incompetence, premature rupture of membranes, low birth weight, increased neonatal morbidity and mortality due to prematurity. [1, 2, 11]

Data extracted from the literature are not homogeneous, but the risk of prematurity consecutive to conization is found in all studies between 9-14% getting up to 22-27% according to some statistics. Premature rupture of membranes is about 5-7 times more common than in patients who have not undergone any surgery to the cervix,
both in patients who deliver at term (20% versus 3%) and in patients who deliver prematurely (17.1% versus 2.6%). [1, 2]

Birth weight less than 2500 g is found in postconisation group in a percent from 12 to 18.4% versus 5 to 7.7% in the general population. The average birth weight is also smaller in the same group of patients, 3147-3156 g versus 3287-3328 g.

Premature birth is common in patients who underwent conisation, noting that extreme prematurity risk is two times higher in patients with two conisations comparing with those with one intervention and 10 times higher comparing with patients without cervix surgery, irrespective the surgical technique (diathermal loop, cold knife, laser, cryotherapy).

Of all the techniques used, cold knife conisation affects most of the obstetrical outcome, while laser ablation and cryotherapy influence it less, maybe because those two procedures are indicated in patients with less severe lesions, maximum depth of destruction of the tissue being less than 5 mm. ERAD does not significantly influence the obstetrical outcome, unless the resected cone height is greater than 1 cm. If the cone height is greater than 25 mm, the obstetrical outcome is severely affected by the increased cases of premature births, particularly by increased percentage of births with extreme prematurity, irrespective the surgical technique used. [1, 2, 5]

Most of the risk factors for premature birth are among the risk factors for cervical intraepithelial neoplasia that explains the increased risk for adverse obstetrical outcome among pregnant women diagnosed with CIN than the rest of pregnant women. [2, 9]

Irrespective the physiopathological mechanisms involved, conisation determines a higher risk of miscarriage in the second trimester, premature birth, especially by premature rupture of membranes, than the general population. This risk is higher if the conisation is performed by cold knife, probably due to a wider excision. It is important to know these things because many patients diagnosed with CIN or CIS are young and the obstetrical outcome is very important in this group of patients.

Management of pregnancy in a patient with prior history of conisation includes screening for lower genital tract infections and ultrasound measurement of the cervical length in the second trimester. Progesterone in patients whose cervical length is less than 25 mm seems to improve the obstetrical outcome. Prophylactic cerclage does not improve the obstetrical outcome. [3, 17]

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References


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