

Treatment of cervical precancerous lesions: cryotherapy and cold coagulation

R. Sankaranarayanan MD

International Agency for Research on Cancer
Lyon, France

Special Adviser in Cancer Control
Head, Early Detection and Prevention Section (EDP)
Head, Screening Group (SCR)

<http://screening.iarc.fr/>

- All high grade CIN should be treated
- Low grade CIN: review after 1 year or treat (if you are not sure about compliance to follow-up)

Principles of treatment of CIN

- Whole transformation zone to be treated
- Minimum depth of treatment is 7mm
- Surveillance of treated patients to assess cure/failure

Treatment for CIN

Ablative treatment

- Cryotherapy
- Electrocoagulation
- Cold coagulation
- Laser ablation

Excision treatment

- LEEP
- Laser excision
- Cold knife conization
- Hysterectomy

Ablative treatment

- Type 1 transformation zone (TZ) (fully visible: one can trace the SCJ in its entirety)
- Lesion involves <75% of transformation zone (TZ)
- Lesion is entirely located in the ectocervix
- No endocervical canal or vaginal involvement by the lesion
- No evidence of invasive cancer
- No history of pregnancy
- No menstrual bleeding
- One can direct a biopsy safely before ablative treatment!

Cryotherapy

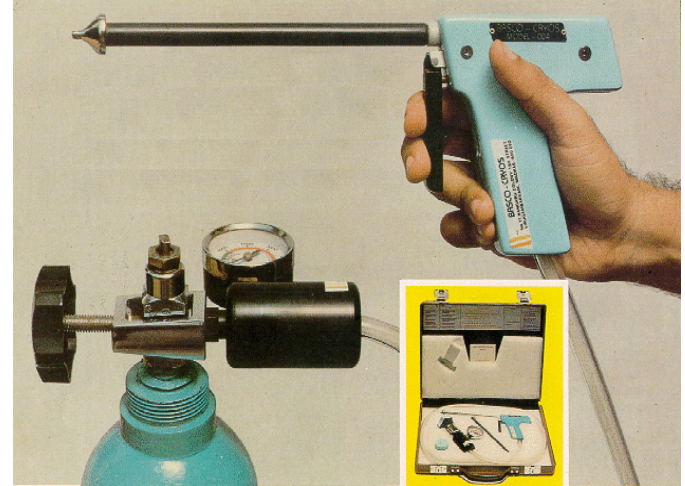
- Safe procedure with “no” complication
- Action by crystallizing the intracellular water
- Temperature at the core of the ice ball:
N₂O : -89°C; CO₂ : -68°C
- The temperature at the edges of ice ball -
20°C

Instruments and equipment

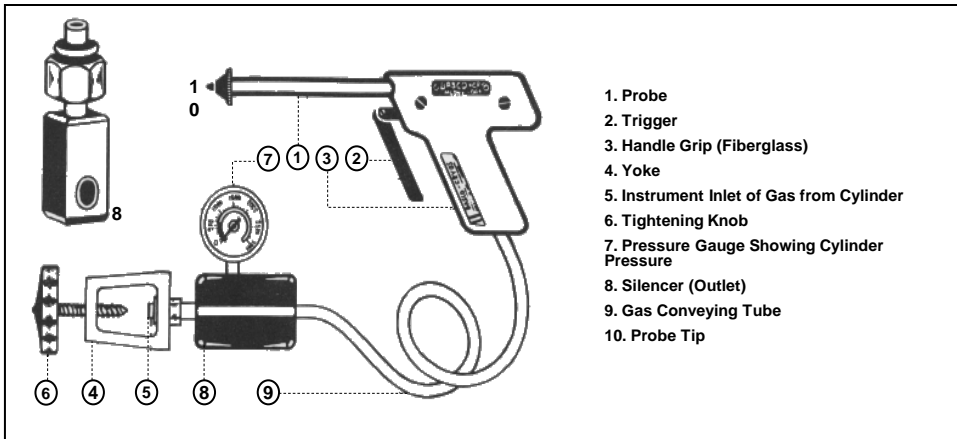
- Examination table
- Halogen focus lamp
- Bivalved speculum
- Instrument tray
- Cryotherapy unit



Cryoprobes, the cryogun, pressure gauge and the stop watch.



Cryotherapy equipment



Cryotherapy equipment components



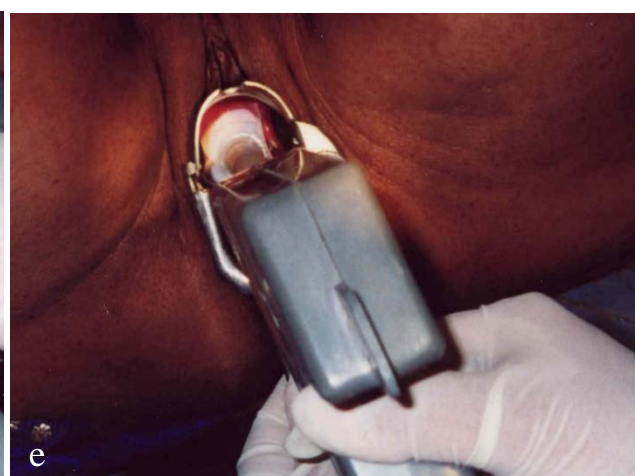
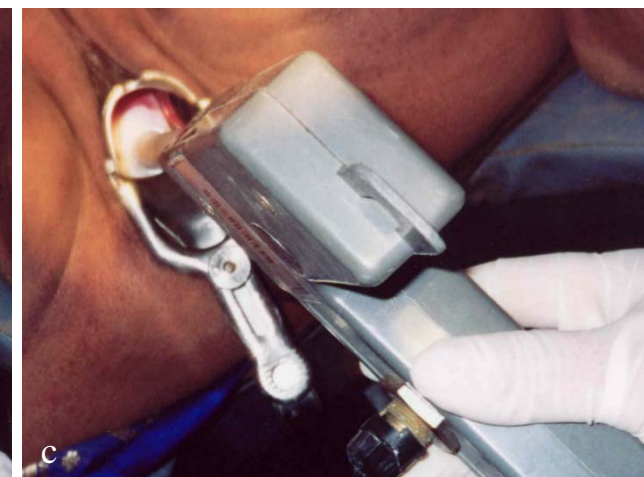
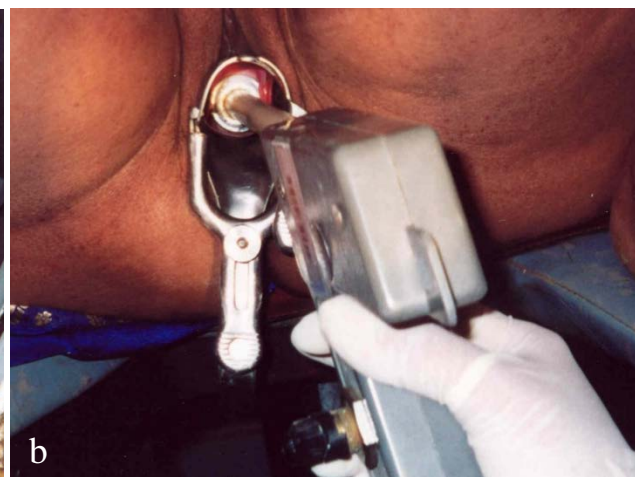
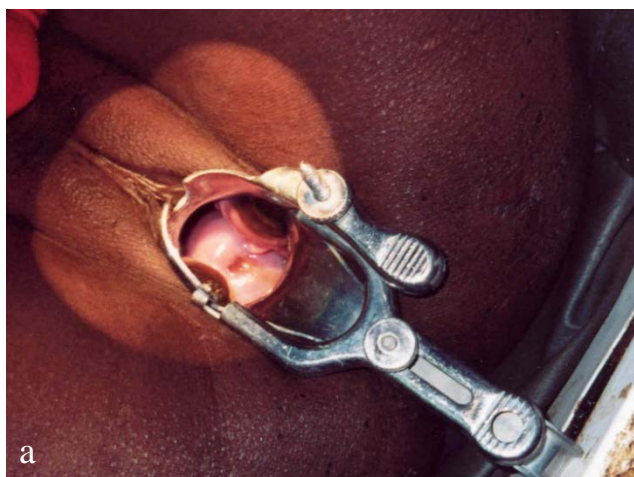
Cryotherapy unit connected to a large gas cylinder (covered with a clean cloth) which is safely placed on a moveable carrier.

Cryotherapy procedure

- Woman in modified lithotomy position
- Insert speculum, expose cervix
- Remove discharge, apply acetic acid
- Apply Lugol's iodine, wipe the tip of cryoprobe with saline and apply the cryoprobe in the cervix
- Set timer
- Freeze for 3 minutes
- Wait 5 minutes after first freeze
- Repeat freezing for 3 minutes

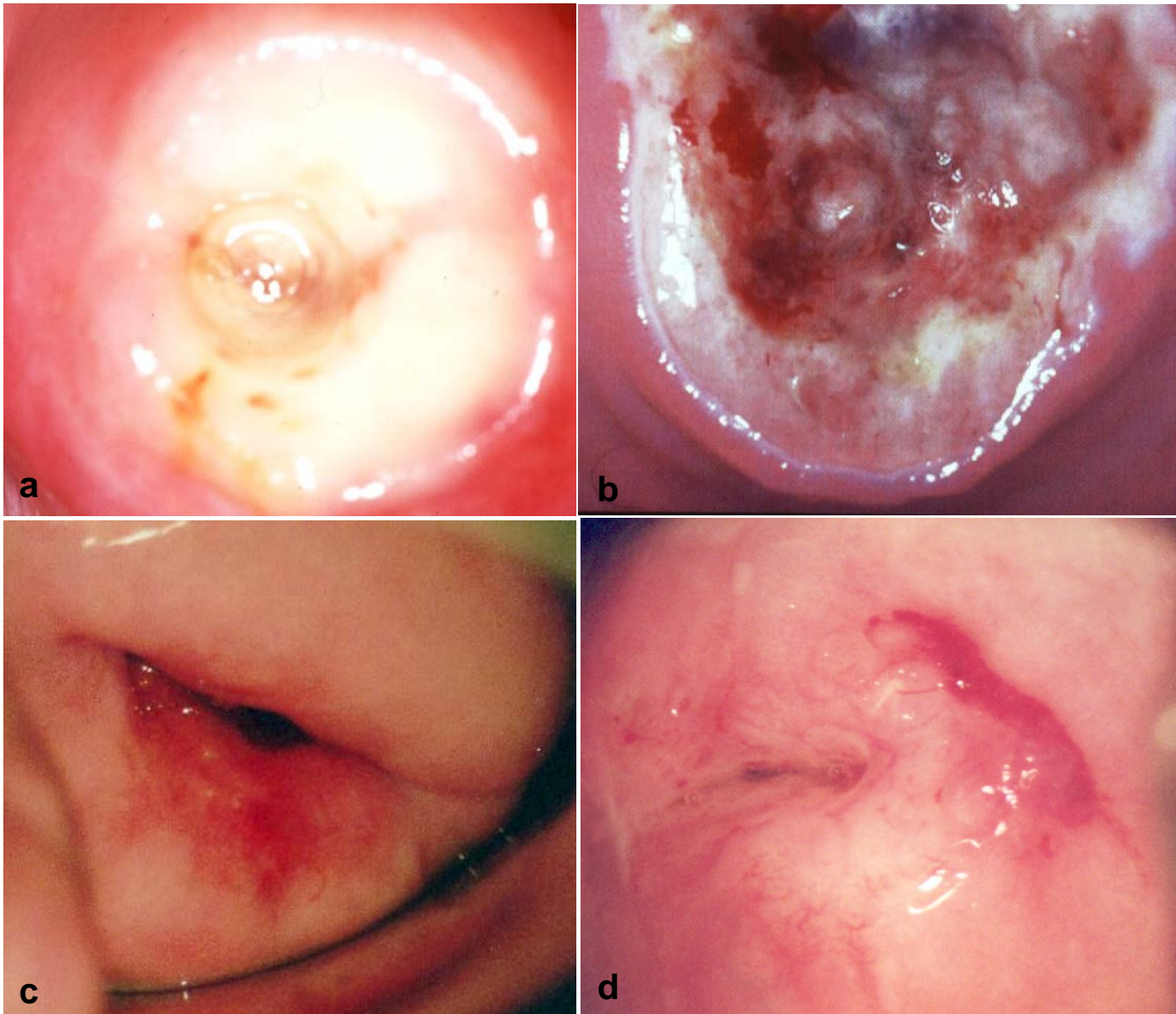
Cryotherapy procedure (contd...)

- Wait for cryoprobe to defrost and remove the probe
- Inspect cervix for bleeding
- Remove speculum
- Reassure the woman
- Advise follow-up care



Cryofreezing in progress. Note the cryoprobe covers the lesion well (a, b). Note the iceball formation in c, d and e. Note the appearance after thawing in f.

[International Agency for Research on Cancer](http://www.iaarc.org)



(a) Note the iceball on the cervix immediately after cryotherapy (b) Appearance 2 weeks after cryotherapy. (c) 3 months after cryotherapy. (d) 1 year after cryotherapy.

Effectiveness of cryotherapy LEEP and Cold coagulation: data from Indian studies

Cryotherapy	Total	Cured rate at 1 year
CIN 1	1550	1350 (87%)
CIN 2	159	123 (77%)
CIN 3	64	49 (77%)

Sankaranarayanan et al., Br J Cancer, 2007;96:738-43;

Nene et al., Int J Gynaecol Obstet. 2008;103(3):232-6.

Wesley et al., Int J Gynaecol Obstet. 2013;123(1):16-20;

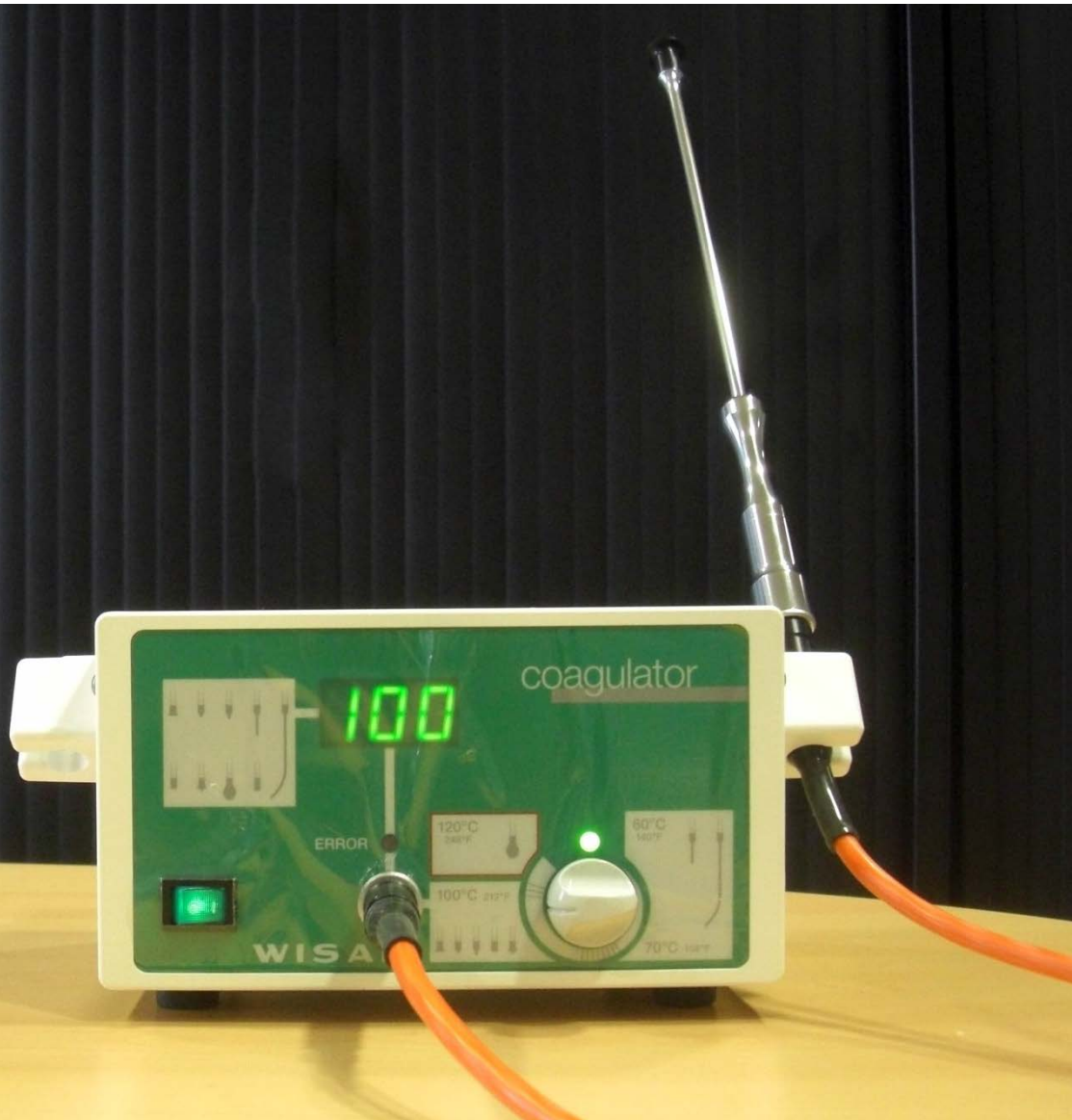
Cold coagulation

- Treatment of cervical intraepithelial neoplasia and benign cervical lesions using a metallic probe heated to 100-120 °C
- Leads to thermal destruction of cervical tissue
- Depth of destruction exceeds 4 mm after 30 second Rx cold coagulation

Cold coagulation: Equipment

- Semm cold coagulator
- Metallic cervical probe
- Wire for electrical connection
- Colposcope
- Cervical speculum
- Light source
- Couch

Cold coagulator



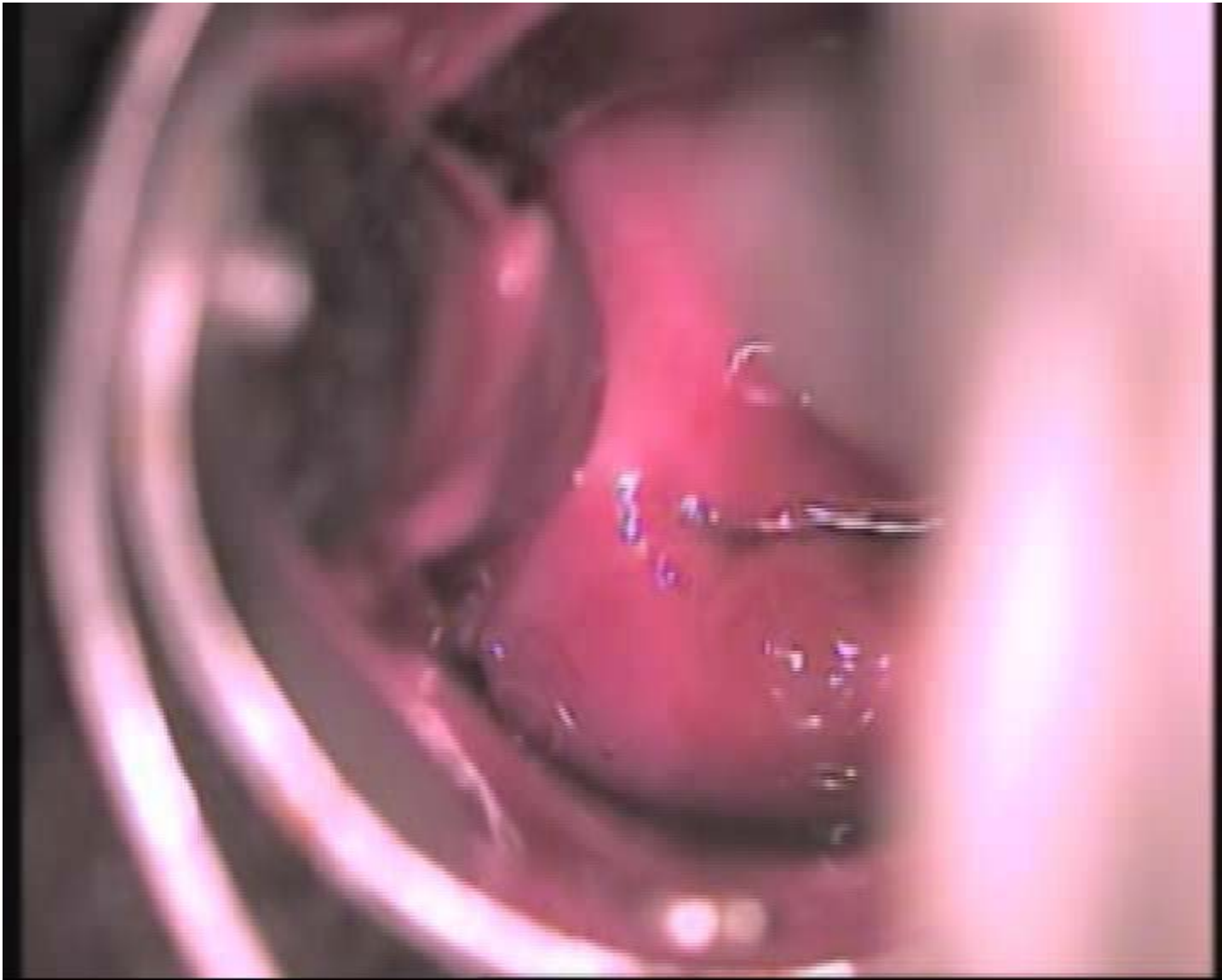
International Agency for Research on Cancer

Cold coagulation: consumables

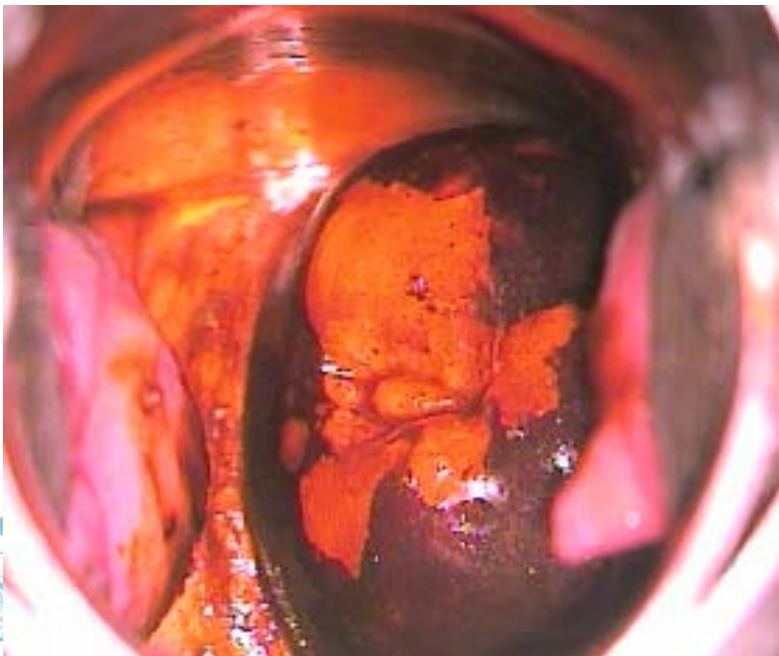
- Cotton swab
- 5% acetic acid and Lugol's iodine
- Electricity

Cold coagulation: procedure

- Patient in lithotomy position
- Cervix adequately exposed
- Delineation of the lesion using 5% acetic acid and Lugol's iodine
- Colposcopic control where colposcope is available
- Set the cold coagulator at 100 °C
- Apply the cold coagulator probe on the cervix and heat for 45 seconds at 100 °C
- 1-5 overlapping applications of 45 seconds each can be used to cover the entire lesion
- More than 90% of the lesion require 1-2 applications only

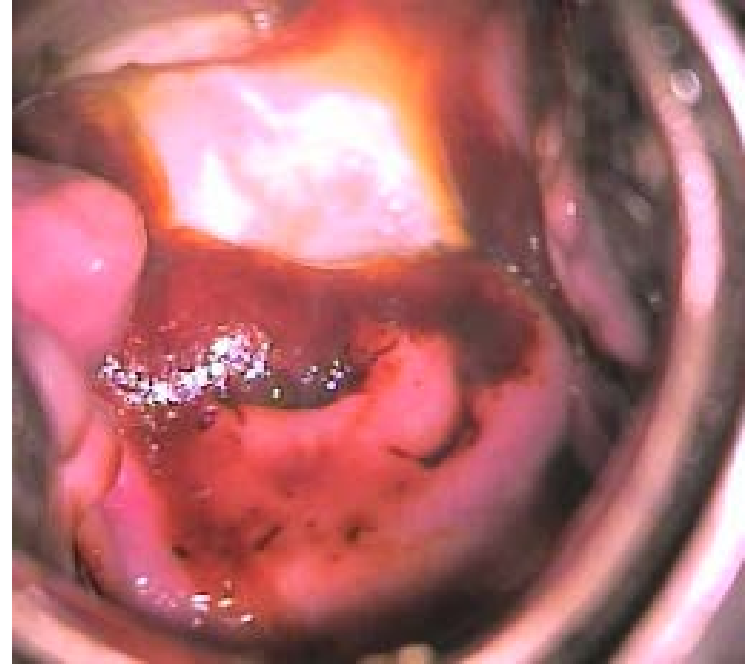
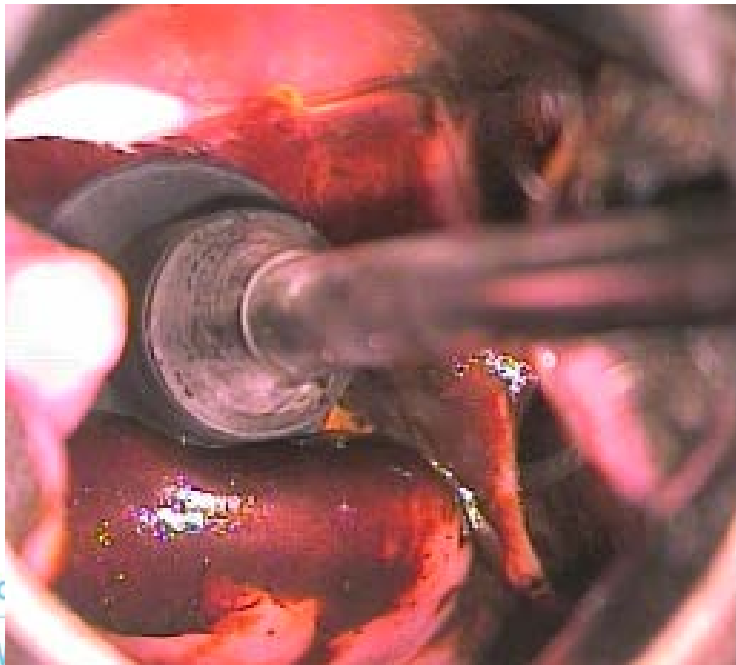
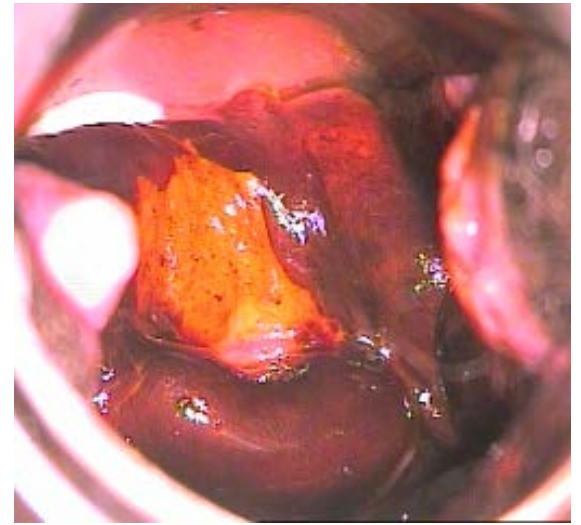


International Agency for Research on Cancer





International Agency for Research on Cancer



Cold coagulation: Sterilization of the treatment probe

- Wash and clean the probe after use with cold water
- Wipe it dry and heat it for 45 seconds at 120 °C
- It is ready for reuse

Cold coagulation: side effects and complications are extremely rare!

- Mild pain
- Vasovagal reactions (fainting, giddiness, mild cramps etc)
- Vaginal burns (careless application!)
- Bleeding (extremely rare)
- Pelvic inflammatory disease
- Cervical stenosis
- Vaso-vagal faints in 2/725
- Cervical bleeding in 6/725

Cold coagulation: effectiveness in curing CIN

- 95% cure rate at 1-year and 92% at 5-years among 1638 patients with CIN 3
- 96.5% cure rate among 680 women with CIN 2
- 97.1% cure rate among 485 women with CIN 1

Gordon & Duncan, BJOG 1991; 98: 14-20;
Loobuyck & Duncan, BJOG 1993; 100: 465-468

Cure rate following cold coagulation: a recent UK experience

- 557 patients with CIN
- 156 with CIN 1, 260 with CIN 2 and 141 with CIN 3
- 1 year cure rate 95.7%
- Has a 1 year cure rate similar to that of LEEP

Parry-Smith et al., J Low Genit Tract Dis. 2014 May 22. [Epub ahead of print]

Cold coagulation: safety

- 17 of 1165 women complained heavy bleeding
- Of the 243 pregnancies in 1628 women treated with cold coagulation 9 (4%) had a first trimester miscarriage and 3 (1.5%) had ectopic pregnancy

Gordon & Duncan, BJOG 1991; 98: 14-20;
Loobuyck & Duncan, BJOG 1993; 100: 465-468

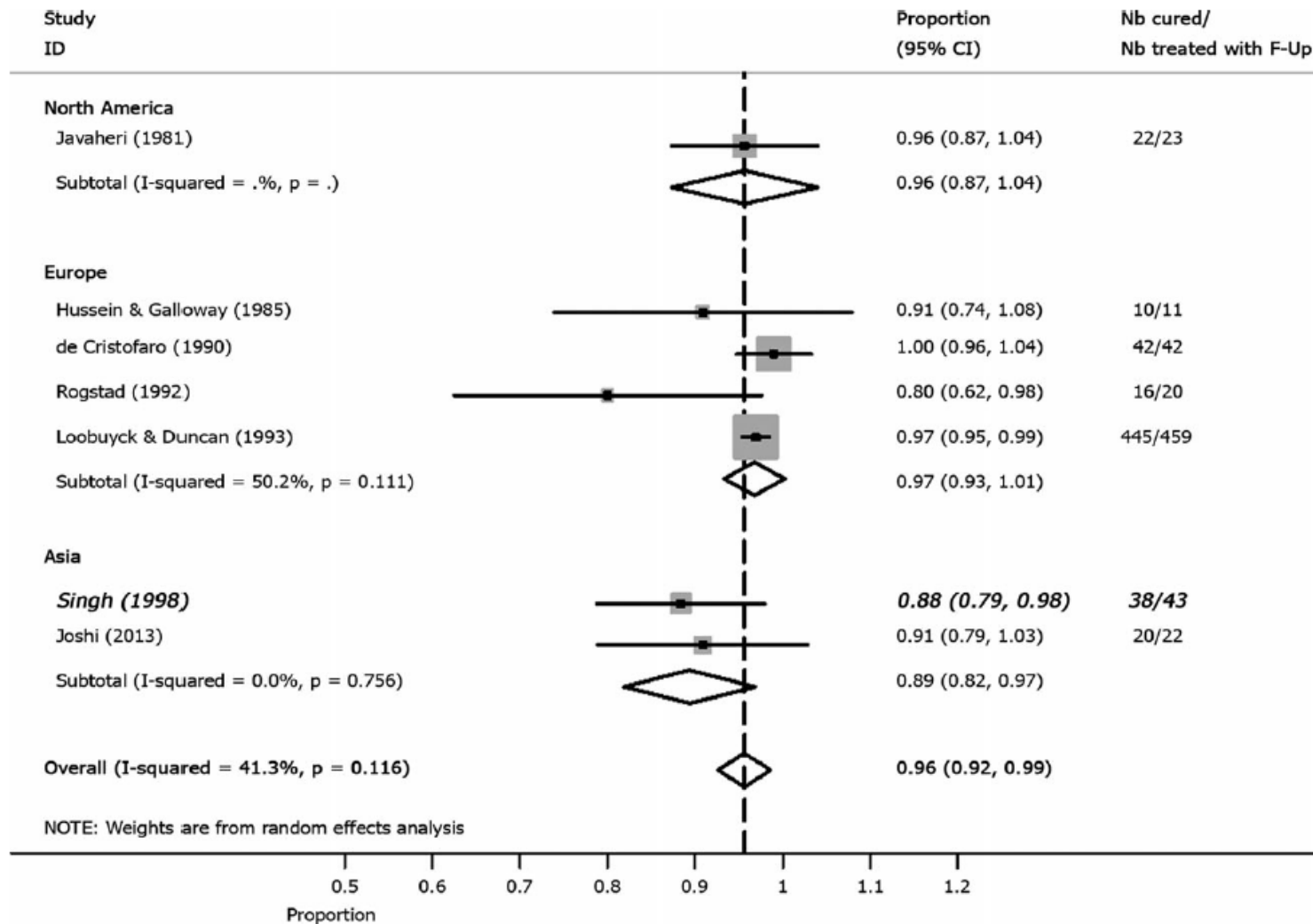
Evaluation of cold coagulation as a more feasible, sustainable and affordable method for treatment of cervical precancerous lesions in India and Bangladesh

- Easy portability
- Less consumable intensive
- Short treatment time, high treatment turn over
- Patient comfort

1-year cure rates of CIN following cold coagulation in the on-going study

	Number of women evaluated	Cure rate	
		Number	%
CIN 1	260	227	87.3
CIN 2 + 3	47	40	85.1
Total	307	267	86.9

Proportion-cured estimates associated with cold coagulation treatment for CIN1 disease, by world region



Cryotherapy/Cold coagulation: post treatment instructions

- Advice on symptoms to expect: mild cramps, blood stained watery discharge
- Use of sanitary pads to prevent secretions staining their clothes
- Avoid: sexual intercourse for 4 weeks from Rx, use of vaginal tampon or douche
- Report for follow-up examination after 12 months

Cryotherapy/Cold coagulation: post treatment instructions

Report back if suffering from any of the following in the 4 weeks following Rx:

- fever for >2 days
- foul smelling purulent discharge for >3 days
- severe lower abdominal pain/cramps
- Bleeding for >2 days

Follow-up procedures at 6-12 months from Rx

- Pap smear (if available)
- HPV testing (if available)
- VIA and VILI
- Colposcopy (if available)
- Biopsies from abnormal areas
- Repeat Rx with cold coagulation or other treatment methods for residual/recurrent lesions