Thermal ablation in LMICs

Miriam Cremer, MD MPH

Associate Professor

Cleveland Clinic Lerner College of Medicine

President/Founder Basic Health International

USA

Disclosures

President/Founder of non-profit BHI

Speaker bureau: Merck, Cooper Surgical

Advisory board: Mylan Pharmaceuticals

No conflict with any device company for diagnostics or treatment

Treatments for cervical cancer endorsed by WHO

Excision procedures

LEEP
(Loop Electrosurgical Excision Procedure)

- Gold standard in high-resource settings
- Must be performed by trained clinicians
- Can have serious complications

CKC
(Cold Knife Conization)

- Must be performed by a surgeon under anesthesia
- Invasive

Ablation procedures

N_2O or CO_2
(Gas-Based Cryotherapy)

- Standard treatment in LMICs
- Little training required
- No serious complications
- Cure rates for CIN2+ similar to LEEP (77-93%)

Thermal ablation (aka cold coagulation, thermoablation, thermocoagulation)

- Desktop device used since 1970s (new handheld devices recently available)
- Ablates tissue by using heat – superficial epithelium blisters, underlying stroma and glandular crypts are destroyed
- Meta-analysis shows cure rates around 95%
- Rigorous trials needed to determine true efficacy, safety, and recommendations for treatment details
- WHO endorsement forthcoming!

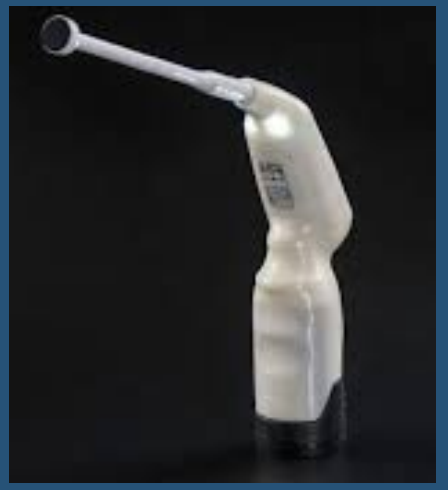
Thermal ablation devices on the market

Original desktop device

Cold coagulator
(WiSAP, Brunnthal, Germany)

New handheld devices

C3 Cold coagulator
(WiSAP, Brunnthal, Germany)



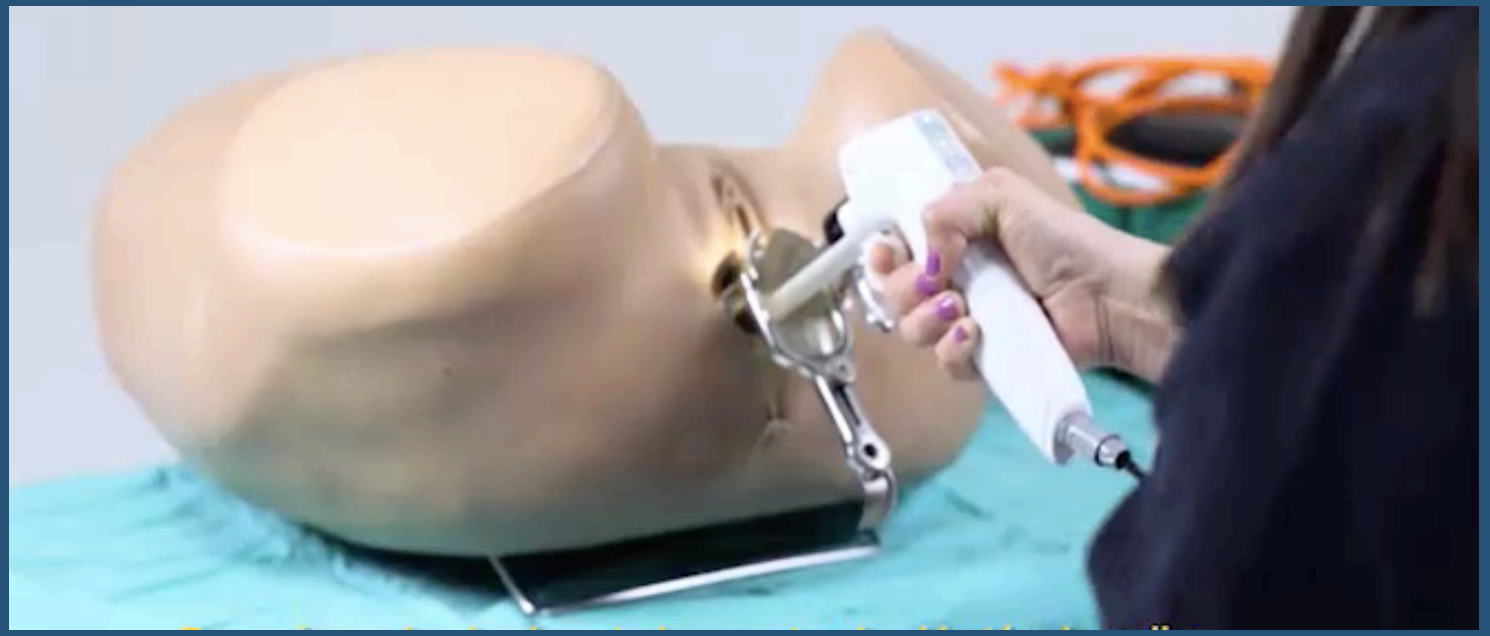
Thermocoagulator
(Liger/Cure Medical,
Lehi, UT)

Who should get thermal ablation?

- Patients with a positive screening test (HPV, HSIL, biopsy-confirmed CIN2/3)
- Patients with none of the following contraindications to ablation:
  - SCJ is not completely visible
  - Lesion larger than 75% of cervix
  - Lesion extending into cervical canal
  - Suspicion of cervical cancer

How should thermal ablation be performed?

- Conventional treatment:
  - Set temperature to 100°C - 120°C
  - Overlapping applications until entire SCJ is ablated
  - Each application lasts 20-40 seconds
- Currently, there is no standardized protocol for thermal ablation



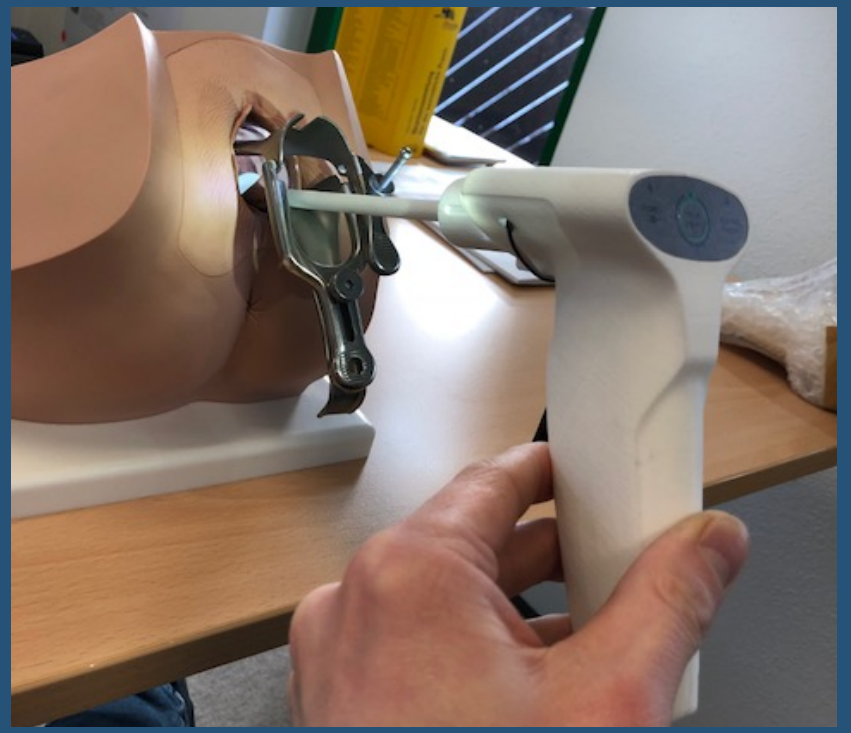
thermal ablation probe tips




- Manufacturers offer a wide range of probe shapes and sizes
- Different probe tips are used at the clinician’s discretion

Changes to new WiSAP handheld device

- Optimized visualization:
  - Longer handle (increased by 30mm)
  - Optimized visualization (LED lights moved from the top to the side to avoid obstructing vision)
- Detachable probes:
  - Designed to accommodate multiple-probe protocol and 1- probe protocol
- RCT to begin October 2019



New C3 Thermoablator prototype (WiSAP, Brunnthal, Germany)

Upcoming RCT

- Funding from NIH Academic-Industrial Partnership and Gateway for Cancer Research
- Goal: to develop a standardized thermal ablation protocol optimized for LMICs
- 3-arm randomized design:
  - Gas-based cryotherapy
  - Thermal ablation with single 17mm conical tip
  - Thermal ablation using 8mm endocervical tip followed by 10mm flat tip

Conical tip

Endocervical (left) and flat (right) tips

Primary endpoint

Clearance of CIN2+ as determined by biopsy before entry into study and at 12 months post-treatment

Important information about about thermal ablation

- Can be performed by midwives/nurses
- Need to be able to visualize the ENTIRE SCJ
- An external battery will last for 60 applications (Liger) or 100 applications (WiSAP)
- No need for local anesthesia
- Device requires very little maintenance
- No high-quality evidence on HIV+ patients
- Liger can be autoclaved, WiSAP handheld no autoclave
- Auto-sterilization is not recommended

Summary

- Thermal ablation is an exciting opportunity for treatment of cervical precancer in LMIC
- New handheld devices are portable, low -cost and easy to maintain
- Trials on desktop device demonstrate high efficacy
- Likely similar efficacy in handheld devices
- Trials underway regarding efficacy in general population, HIV+ women, and streamlining of protocol

Thank you