Photodynamic therapy (PDT) of cervical intraepithelial neoplasia

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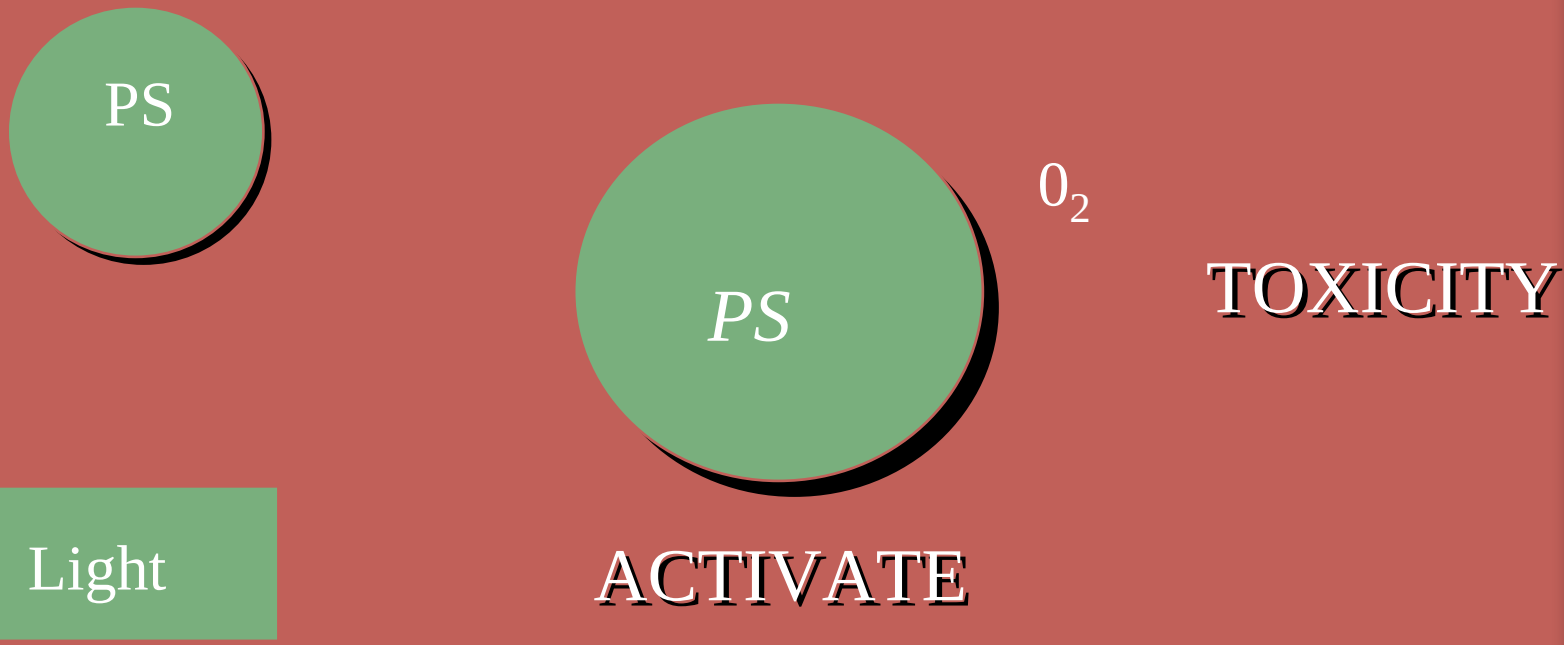
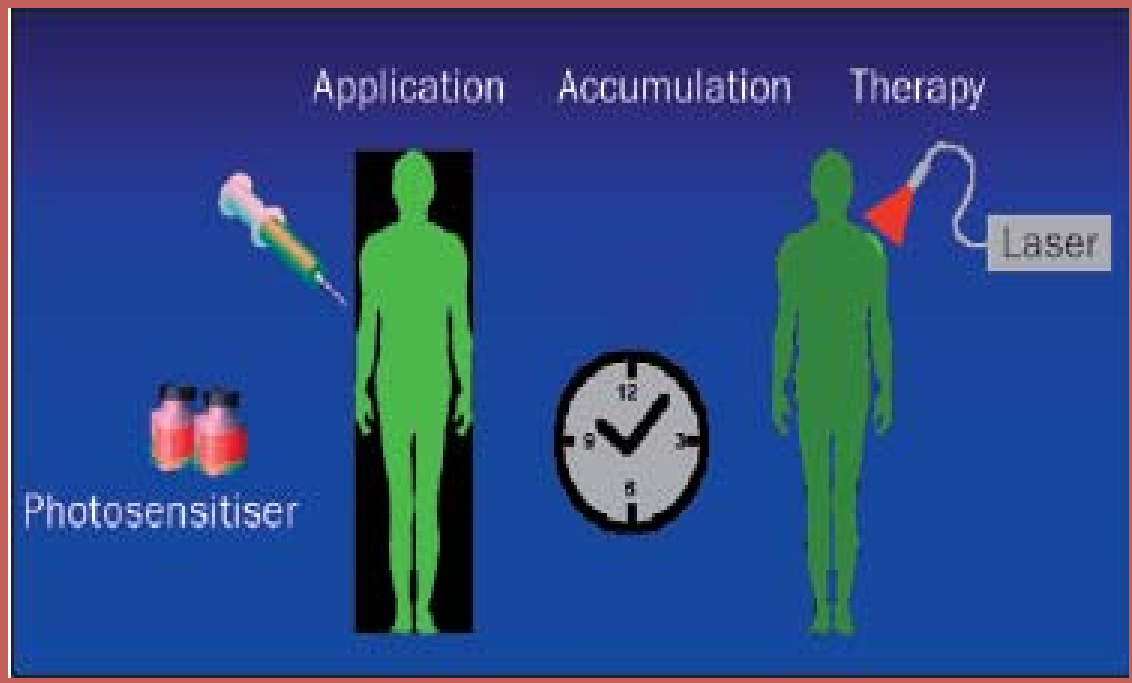
Photodynamic therapy of cervical intraepithelial neoplasia: Is it past, reality or future?

PHOTODYNAMIC THERAPY



Use of a photo-sensensitizer (PS) to aid in the diagnosis (fluorescence) or treatment of cancer cell (radical oxygen)

PHOTODYNAMIC THERAPY



Photosensitizers

- Porphyrins
  - Photofrin (PF) - intravenous
  - "Aminolevulinic acid (ALA)“- local

    Protoporphyrin IX (PpIX)
- Chlorins
  - m-Tetrahydroxyphenyl chlorin (mTHPC)
  - Benzoporphyrin derivative mono-acid (BPD)
  - Tin ethyl etiopurpurin (SnET2)
- Phtalocyanines

Material and methods

- Medline was searched

- 9 studies was :

1. 2 studies local application with (ALA) drug light interval 1,5h-5h

   1 study local application with (ALA) drug light interval 1,5h-5h, a randomised, double-blind, placebo-controlled trial

2. 2 studies local application with (ALA) drug light interval 8h-24h

   1 study local application with (DHE) drug light interval 8h-24h

3. 3 studies intravenous application (PF)

- In all studies was include non pregnant women with age 18-62yrs
- 6 studies looked HPV destruction

Results

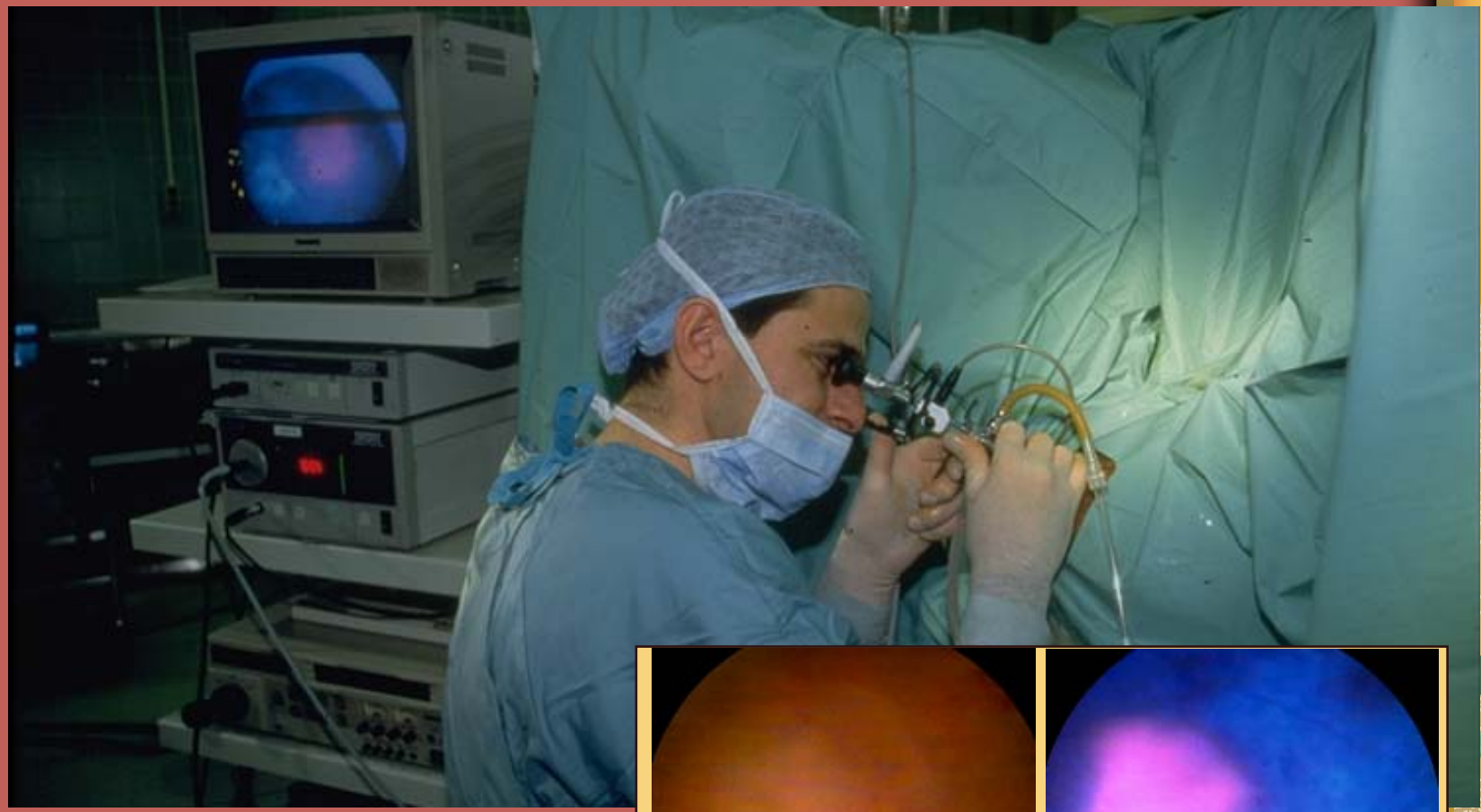
	Cure rate % (number of patients)	HPV eradication
Local application Drug light interval 1,5h-5h (3 studies)	16% (51)	
Local application Drug light interval 8h-24h (3 studies)	91% (31) (ALA) 68% (22) (DHE) 83% (53) (total)	73-80%
Intravenous application (3 studies)	92% (192) (Photofrin)	72-80%

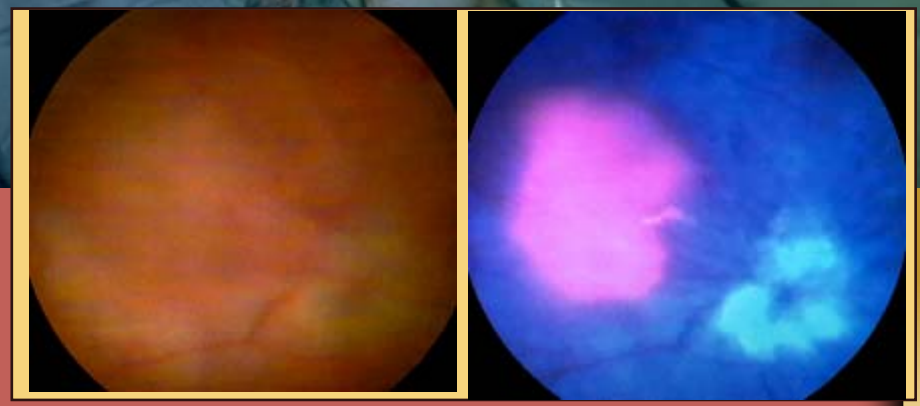
Conclusion

- High cure rate (83%) was observed with local drug application – illumination time interval in studies with more than 8h
- ALA (91%) was more effective than DHE (68%)
- High cure rate (92%) with Intravenous application of Photofrin was observed in all 3 studies.
- Local and iv sensitizer application are very good for specific HPV eradication (75%)

- No side effects (skin phototoxicity) with local application
- Further larger, well designed studies are needed with local application and longer time interval

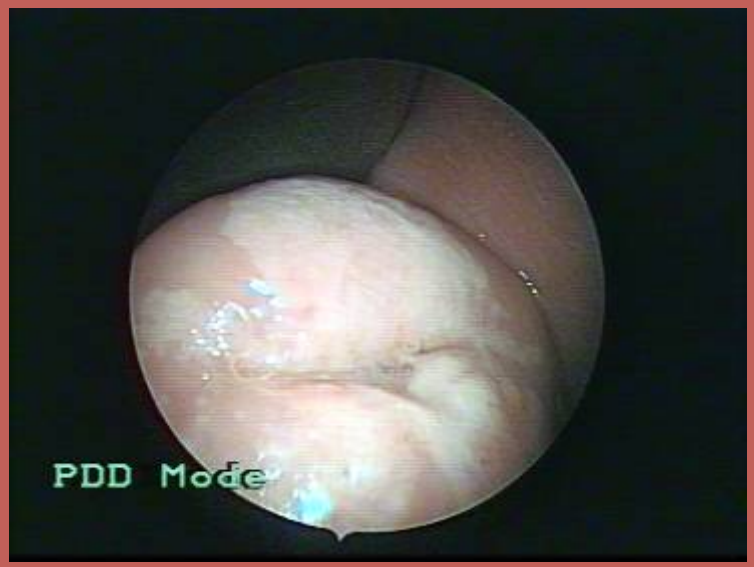
P HOTODETECTION





Fluorescence image of the cervix after h-ALA application

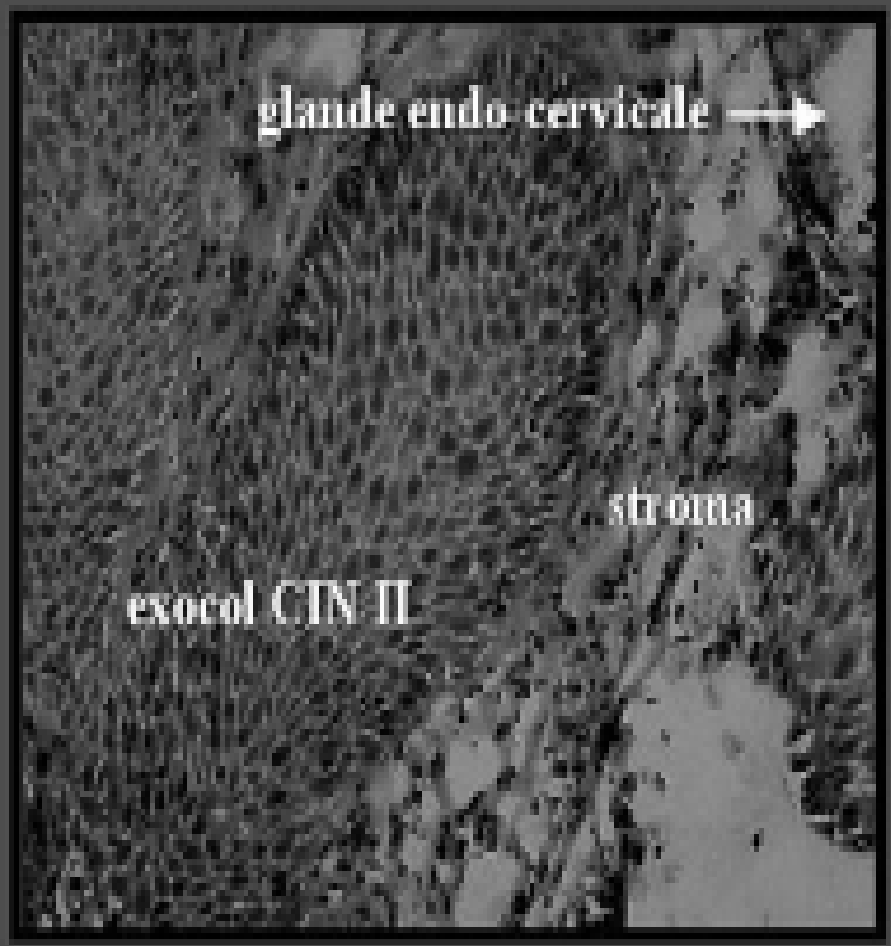
White light

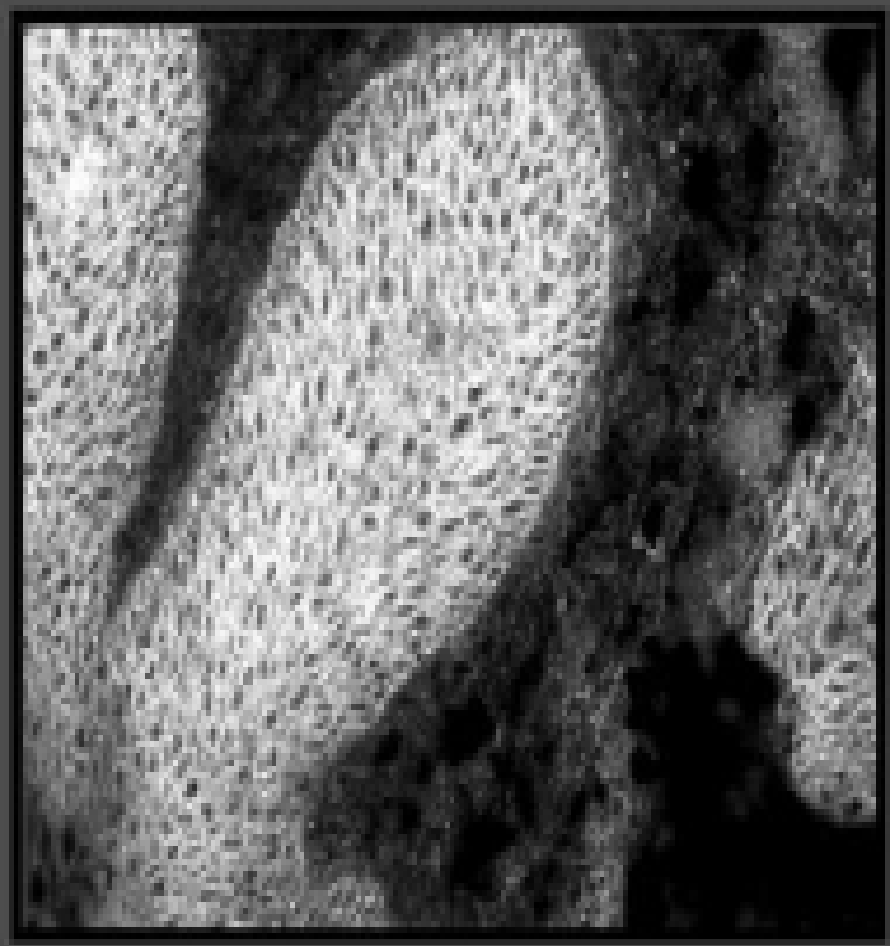


Fluorescence

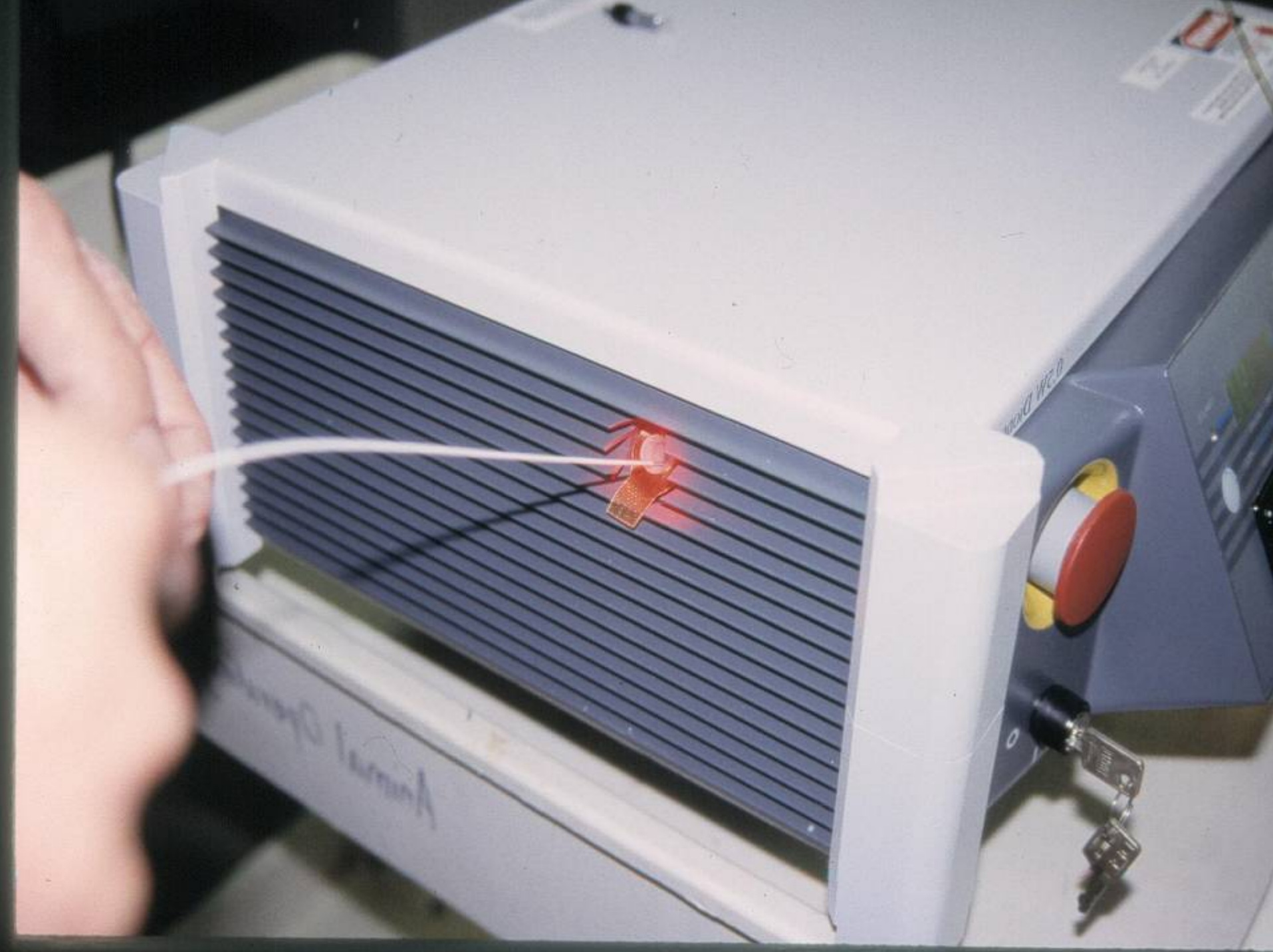
Fluorescence image and white light image of the cervix uteri after the application of 5% acetic acid.
Application of 10mg HAL in 10ml 0.9% NaCl solution on the cervix during 3 hrs.

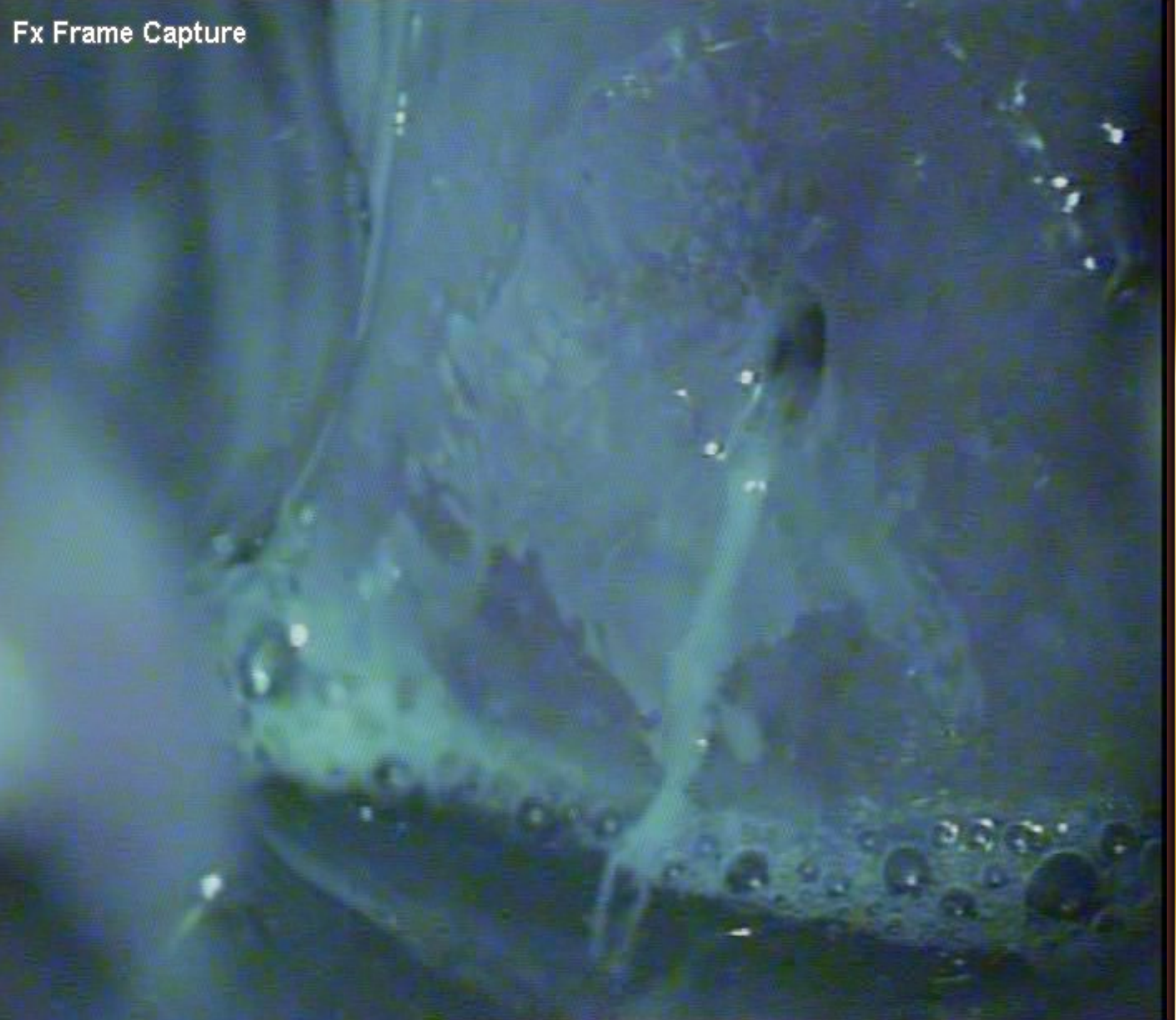
CIN II x20, HAL 0,5%, 180 min application





Départements de Pathologie Clinique et de Gynécologie et Obstétrique HUG & EPFL, mai 2002

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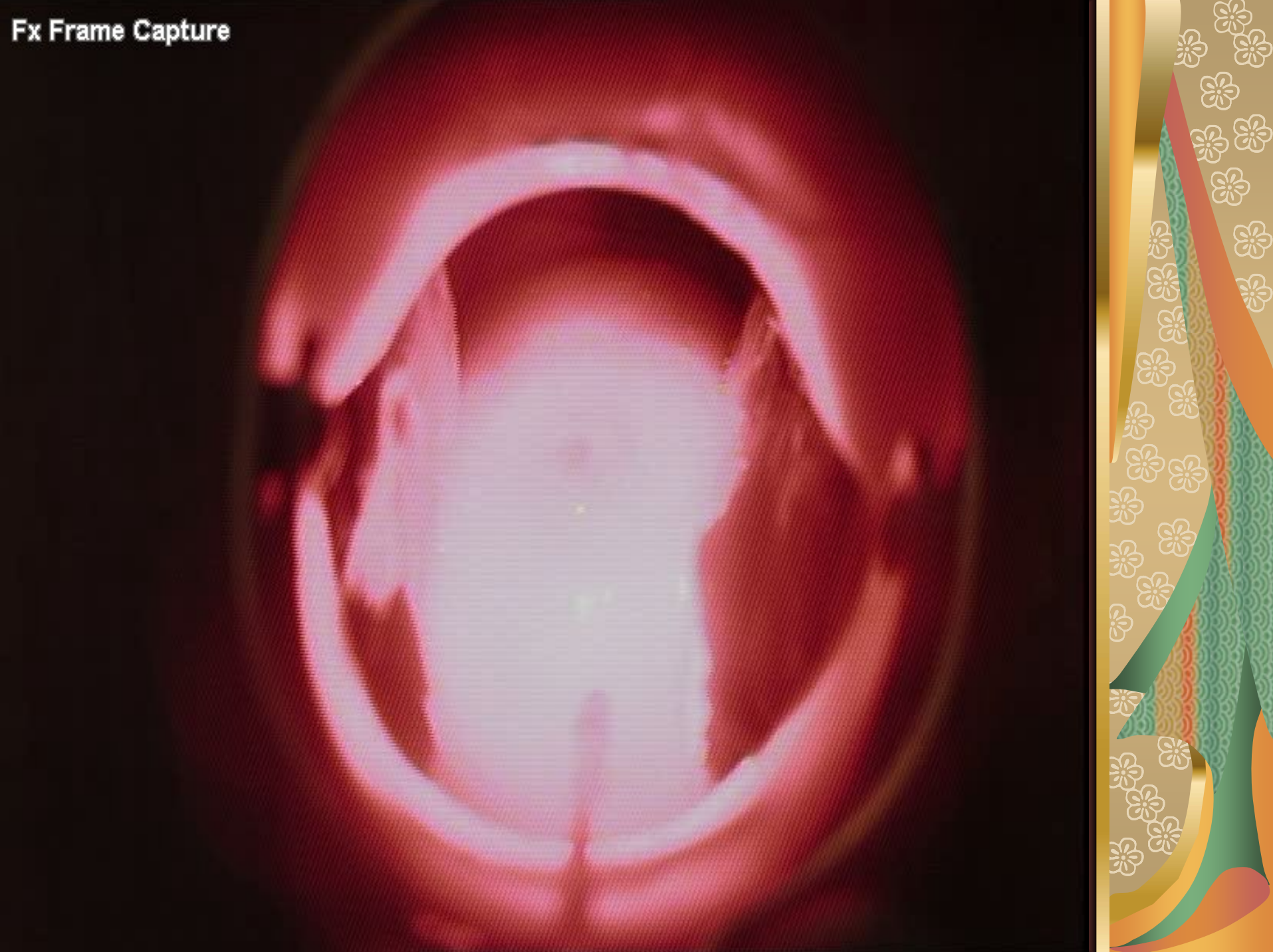
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(a)


(b)

Advantages to treat CIN with PDT

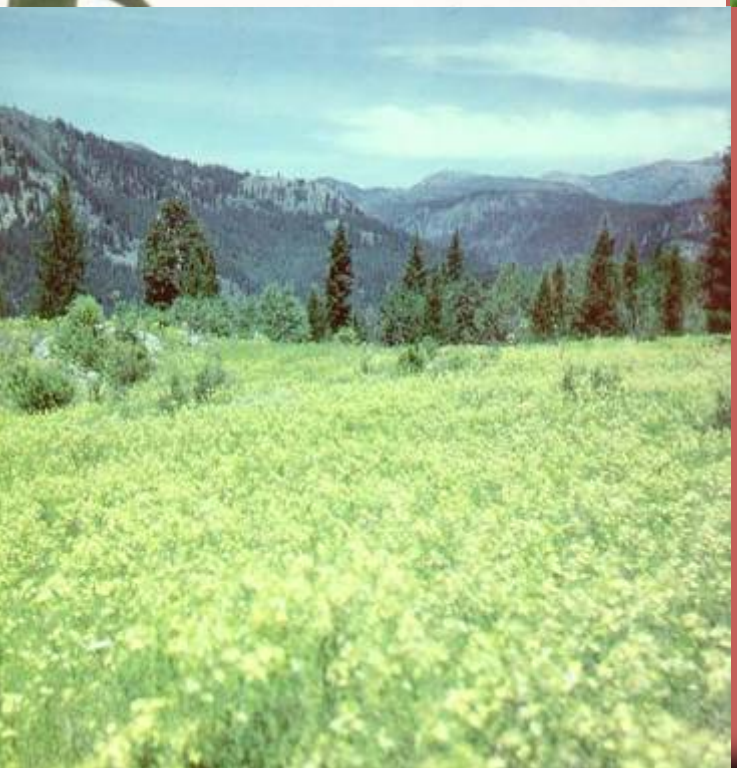
- Outpatient clinic
- Specificity (drug, light)
- Tailored to the shape of the cervix
- No stromal destruction (stenosis, cervix insufficiency)
- Cell death by apoptosis (no inflammation, no scarring)
- Specific HPV destruction (tetrapyrrol)
- Repeatable

- In young women with open fertility planning

PDT may become also reality in developing countries because:

- Sensitizer (Hypericin) from St. Johns Wort (cultivated in own garden like ancient Chinese and Egyptian, for skin cancer treatment)
- Light applicator (LED)

Can be developed (with batteries)



St. Johns Wort


Merci

Haem Biosynthesis