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Clinical performance of Adult Circumcision Devices Compared with Surgery

Entebbe Uganda, 13 November 2013

World Health Organization

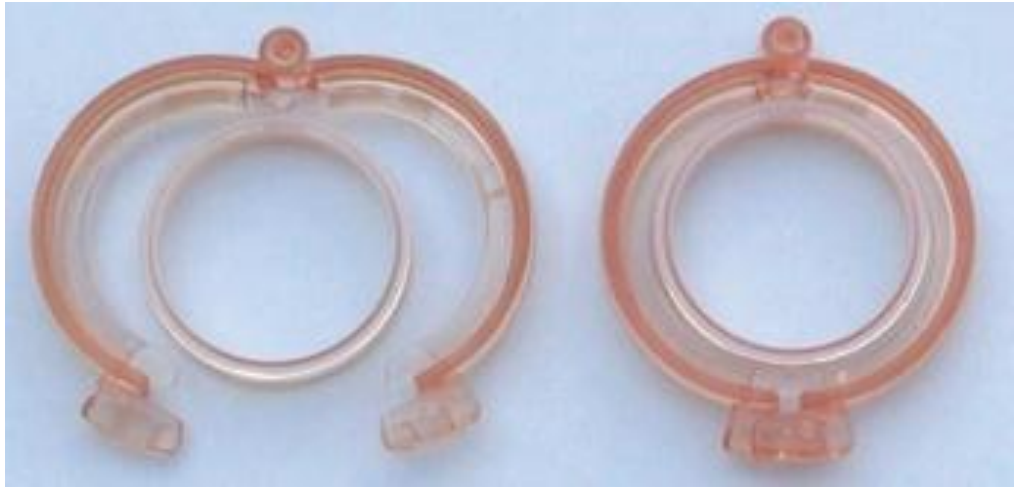
Framework for Clinical Evaluation of Devices

- Safety study(ies) in country(ies) of intended final use
- Formal randomised comparison with established methods(s) of circumcision
- Acceptability studies in country of intended final use
- Field studies in settings of intended final use

At least two independently conducted series of studies

Collar Clamp Device

- Only one example for which data available
- Shang Ring, developed in China and studied in China and Africa



Shang Ring Studies Reviewed

Study (type)	Location	Clients	Type of providers
Safety Study	Kenya	40 healthy HIV-negative men	Physicians and nurses experienced in conventional surgical circumcision
Spontaneous Detachment	Kenya	50 healthy HIV-negative men	Physicians and nurses experienced in conventional surgical circumcision
Randomized Comparison with Surgery	Kenya and Zambia	200 Shang Ring, 200 surgery, healthy HIV-negative men	Physicians and non-physicians, all with extensive experience with surgical male circumcision
Field Studies	Kenya and Zambia	1256 healthy HIV-negative men	Physicians and non-physicians, all with extensive experience with surgical male circumcision
Acceptability and Safety	Uganda	621 healthy HIV-negative men, 508 of whom chose Shang Ring	Clinical officers in sterile conditions in outpatient operating rooms

Shang Ring Priority Outcomes (1,983 placements)

- High proportion of clients eligible and device successfully placed
  - 98.8% of men eligible for device circumcision and device successfully placed
  - Device could not be placed in 15 men (0.8%)
    - Correct ring size not available (8)
    - Foreskin slipped from outer ring (3), damaged (2), too short (1)
    - Outer ring could not be closed (1)
- High proportion with successful circumcision by device alone
  - 1,980 (99.8%) foreskin successfully removed by device alone
  - 3 (0.2%) had insufficient skin removed

Adverse Event Classification adopted by TAG

Adverse Event (AE)

Any untoward medical occurrence, unintended disease or injury, or untoward clinical signs, excluding those definitely not related to the procedure or device

Serious Adverse Event (SAE)

An AE that resulted in medical or surgical intervention to prevent permanent impairment to body structure or a body function, *even if no permanent impairment occurred*

Moderate AE

Any AE not classified as an SAE but that required an intervention by a health care provider or medication (parenteral, oral or topical)

Mild AE

All other AEs

Shang Ring Adverse Events (TAG Classification)

Type of Event	Number	Per cent [95% CI]
Total placements	1,983	
Serious AEs	**0**	**0.0% [0.0%, 0.2%]**
Moderate AEs	**20**	**1.0% [0.6%, 1.6%]**
Pain placement (8) Infection (4) Insufficient skin removed (3) Pain leading to early removal (2) Wound disruption (2) Bleeding (1)		
Mild AEs	**43**	**2.2% [1.6%, 2.9%]**

Shang Ring Priority Outcomes

- Healing times (longer than surgery)
  - Comparative study, mean time to complete healing
    - Shang Ring: 44.1 (SD 12.6) days from date of placement
    - Surgery: 38.9 (SD 12.6) days from date of surgery
    - Average 5.2 (2.7–7.7) days longer
  - Healing by secondary intention with ring circumcision

Shang Ring Priority Outcomes

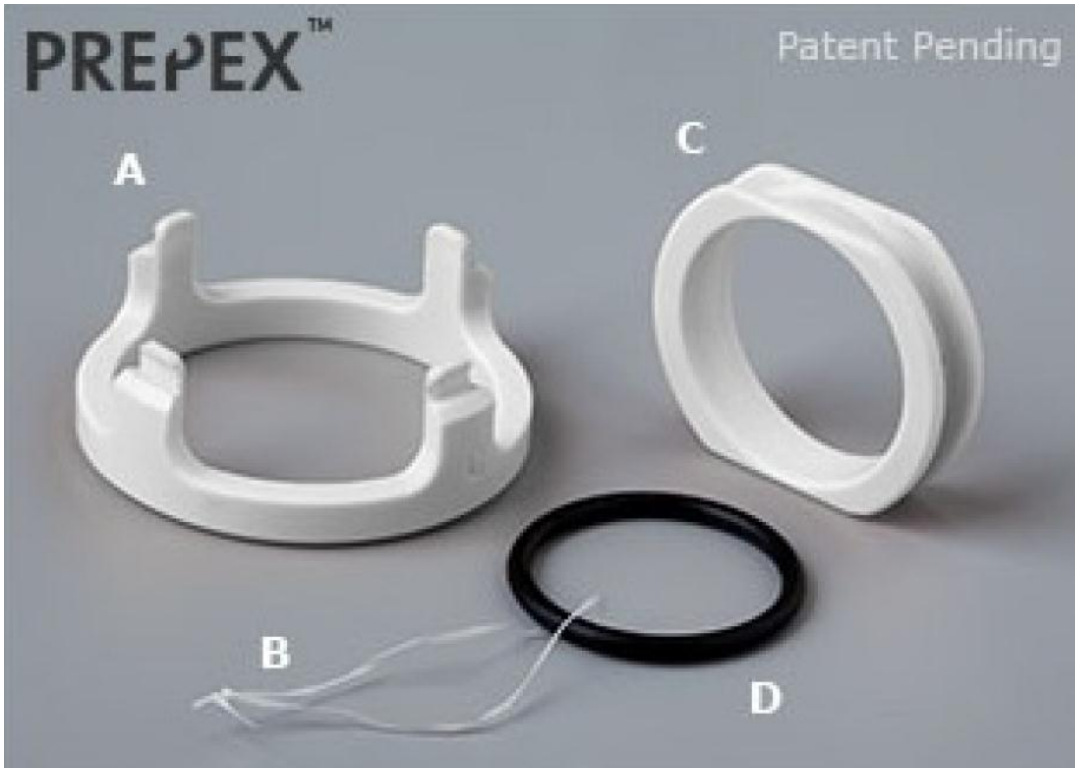
- Pain
  - Local injectable anaesthesia required for placement
  - Some pain while wearing and somewhat higher during erection than at comparable times following surgery
  - Short, transient discomfort or pain during device removal

Shang Ring Priority Outcomes

- Procedure times (shorter than surgery)
  - Placement time 6.4 (SD 3.8) mins
    - Excludes time for injection and induction of local anaesthesia
  - Removal time 3.1 (SD 1.8) mins
  - Total time 10.3 mins (placement and removal)
    - Comparison: mean time for surgical circumcision 20.3 minutes (Kenya and Zambia studies)
    - Excludes time for injection and induction of local anaesthesia

Elastic Collar Compression Device

- Only one example for which data are available
- PrePex Device, developed in Israel and studied in Africa



PrePex Studies Reviewed

Study (type)	Location	Clients	Type of providers
Safety Study	Rwanda	50 healthy HIV-negative men	Physicians and nurses
Randomized Comparison with Surgery	Rwanda	144 PrePex, 73 surgery	Physicians and nurses
Pilot Study	Rwanda	49 healthy HIV-negative men age 21–54 years	Nurses
Field Study	Rwanda	666 generally healthy men [5 HIV-positive]	Lower cadre nurses
Safety Study	Zimbabwe	53 HIV-negative men	Physicians and nurse assistants
Randomized Comparison with Surgery	Zimbabwe	240 HIV-negative men	As above
Field Study	Zimbabwe	641 HIV-negative men	Nurses with physician back-up support
Field Study	Uganda (IHK)	634 healthy men	Surgeons, medical officers, clinical officers and nurses
Field Study	Uganda (Rakai)	187 HIV-negative men	Not stated

PrePex Priority Outcomes (2,417 placements)

- High proportion of clients eligible and devices successfully placed (92.6%)
  - 5.9% of men considered unsuitable for PrePex circumcision due to phimosis, narrow foreskin opening, tight frenulum, other penile abnormalities
  - Device could not be placed in 38 men (1.3%)
    - Narrow, tight or short foreskin (31)
    - Adhesions (4)
    - Penis circumference outside the range of available ring sizes (3)
- High proportion with successful circumcision
  - 2,405 (99.5%) foreskin successfully removed by device alone
    - Surgery after: self-removal (4), requested early removal (2), displacement (5), device and foreskin removed surgically under local anaesthesia (1)

PrePex Adverse Events (TAG Classification)

Type of Event	Number	Per cent [95% CI]
Total placements	2,417	
Serious AEs	**9**	**0.4% [0.2%, 0.7%]**
See details on next slide *All required prompt surgical intervention to prevent permanent injury or damage*		
Moderate AEs	**18**	**0.7%% [0.4%, 1.2%]**
Premature removal (8), Bleeding (5) Displacement (2), Infection (2), Difficult removal (1) *All required medical intervention to manage*		
Mild AEs	**15**	**0.6% [0.3%, 1.0%]**

PrePex Serious Adverse Events (total 9)

- Device displacements following sexual activity, masturbation, erection, possible placement error, or accidental dislodging by another person (4)
- Premature self-removal secondary to pain (1)
- Meatal injury at removal (1)
- Difficult removal due to necrotic tissue everted over elastic ring requiring surgical intervention (1)
- Wound disruption or dehiscence (2)

- **Displacements associated with pain, oedema and blistering required prompt surgical intervention to avoid serious infection or permanent injury to penis**

PrePex Priority Outcomes

- Healing (longer than conventional surgery)
  - Comparative study, mean time to complete healing
    - PrePex: 38.0 (SD 12.1) days from placement
    - Surgery: 23.0 (SD 7.5) days from date of surgery
    - Average 15 (12 - 18) days longer
  - Healing by secondary intention following ring circumcision

PrePex Priority Outcomes

- Pain
  - Greatest pain and discomfort 3-6 hours after placement
  - Pain control protocols evolved during initial studies in Rwanda
  - 5% lidocaine topical anaesthetic cream applied immediately before placement, oral analgesics given to take as required
  - Appears to be somewhat less pain while device worn than at comparable times following surgery
  - Transient but intense pain reported by some men as necrotic foreskin and device removed

PrePex Priority Outcomes

- Procedure times (faster than conventional surgery)
  - Placement preparation 2.0 (SD 0.8) min
  - Placement procedure 1.5 (SD 1.0) min
  - Removal preparation 0.4 (SD 0.2) min
  - Removal procedure 2.0 (SD 1.1) min
  - In comparative study total placement and removal times 5.7 (SD 1.4) min, compared with 19.2 (SD 3.9) min for surgery

Balance of Benefits and Harms

- Eligibility
  - Standard contraindications to medical circumcision apply to devices (active infection, congenital anomalies, …)
  - A small proportion of men not eligible for device circumcision (require conventional surgical circumcision)
  - Approximately 5% - 7% not suitable for circumcision with elastic collar compression device
- Successful circumcision
  - Similar proportion of successful circumcisions as with conventional surgery (> 99.5%)

Balance of Benefits and Harms

- Healing times
  - About 1-2 weeks longer on average following circumcision by device compared with surgery
- Safety
  - AE rate comparable to (and possibly lower than) conventional surgery
  - A few SAEs required prompt skilled intervention to prevent serious sequelae

Balance of Benefits and Harms

- Pain
  - Similar to or lower than levels reported following conventional surgery
- Procedure times
  - Shorter than conventional surgery (even if including time for removal), particularly for elastic collar compression device

Values and Preferences of Clients

- Cosmetic result
  - High level of satisfaction following device and surgical circumcision
  - Devices leave neat circumferential wound with no suture marks
  - Comparative cosmetic results 1 year or more following procedure not available
- Odour
  - Some complaints of bad odour reported by clients and noticed by health care providers during removal of necrotic foreskin and elastic collar compression device

Values and Preferences of Clients

- Period of Sexual Abstinence
  - Healing times on average 1-2 weeks longer with device than conventional surgical circumcision
  - Healing may take up to 8-9 weeks in rare cases
- Interference with work and daily activities
  - Direct comparative data lacking
  - Minimal interference with work and daily activities while wearing devices
  - Some interference with urination reported with elastic collar compression device

Values and Preferences of Clients

- Anaesthesia
  - Avoiding injection of local anaesthesia cited as major factor in expressed preferences for elastic collar compression device
- Mandatory Second Visit
  - Unclear whether has any impact on acceptability

Values and Preferences of Providers

- Large proportion of physicians and non-physicians expressed preference for device over conventional surgical circumcision
  - Easy to perform and faster
  - Better cosmetic results
  - Fewer complications
  - No need for suturing
  - Less bleeding
  - No need for routine injectable anaesthesia with elastic collar compression device