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Technical Challenges of Male Circumcision: Focus on Anesthesia, Hemostasis, and Closure

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Critical Underlying Issues

- Vital Triad:
  - Patient safety
  - Surgical quality
  - Cost effective care
- Impact of Success/Failure:
  - Potential effects on MC acceptability within communities
  - Potential effects on HIV transmission rates within communities

Local Anesthesia for Adult MC

- Traditional circumcision rites often performed without anesthesia
- In uncircumcised ethnic groups, use of anesthesia likely to increase acceptability:
  - By “medicalizing” the procedure
  - By preventing significant pain with MC

Why consider alternatives to injections?

- Novice learners have most difficulty with providing and achieving anesthesia using injections
- Injections are painful
- Injections have potential complications– anesthetic reactions, hematoma, needlestick injury
- Potential for unsafe reuse of syringes and needles
- Cost

INJECTIONS ARE A POTENTIAL DETERRENT TO USE OF MC SERVICES

Ideal Local Anesthetic Agent

- Affordable and readily available
- Stable in tropical climates
- Easy to administer
- Minimal risk to the caregiver during administration
- Administration of anesthetic should be pain free
- Highly effective (low failure rate)
- Pain control persists for duration of procedure and into the immediate post-operative period
- Few complications

Options for Local Anesthesia

- Injection:
  - Ring block
  - Dorsal block
- Transdermal application:
  - Topical cream (like EMLA)
  - Topical spray
  - Gel sponge + electric current
  - Impregnated patch + heat

Local Anesthesia for Adult Male Circumcision

Anesthetic type	Minutes to full anesthesia	Anesthesia duration Hours	Pain with application	Failure rate	Side Effects	Relative Cost
Lidocaine inj 1–2%	2	1.5-2	Mod	Low	Rare/ Serious	Low
Bupivicaine inj .25–.5%	5	2-4	Mod	Low	Rare/ Serious	Moderate
EMLA cream (5% lidocaine/ prilocaine)	60+	1-2	None	Low	Rare	Moderate
Hurricaine spray benzocaine 20%	20	<1	None	High	Rare/ Serious	Moderate
Synera heated patch lidocaine 70 mg, tetracaine 70mg	20	1	None	Low	Rare	High
Numby stuff electric iontocaine, 2% lidocaine	10	1	None	low	Rare	High

Complications/Potential Shortcomings of Local Anesthesia

- Pain with injection
- Allergic reaction to drug
- Poor efficacy
- Inadequate duration
- Hematoma at injection site

Unanswered Questions Related to Local Anesthesia for MC

- Can topical anesthesia be utilized as the primary means of local anesthesia prior to adult MC?
- What is the ideal topical agent to use?
- What is the ideal application time?
- What is the rate of anesthesia failure (requiring second line injection for anesthesia) with transdermal methods?

Unanswered Questions Related to Local Anesthesia for MC (continued)

- What is the intra-op pain rating compared topical to injection?
- What is the staff perception of ease of use?
- What is patient satisfaction comparing topical to injection?
- What is the complication rate for topical? For injection?
- What is the cost differential comparing topical to injection?

Achieving Hemostasis

- Careful patient selection
- Establishing intraoperative hemostasis:
  - Bleeders
  - Suture line closure
  - Bandaging
- Maintaining post-operative hemostasis:
  - Prevention key
  - Timely management of complications

Maintaining Post-Operative Hemostasis

- Focus on prevention:
  - Patient selection
  - Meticulous intra-operative hemostasis
  - Potential use of device with retained portion at suture line
  - Prevention of post-operative erection (most relevant in adolescents)

Maintaining Post-operative Hemostasis (continued)

- When prevention fails—timely medical evaluation/treatment
  - Conservative management:
    - Pressure dressing
    - Impregnated dressing
    - Referral
  - Surgical re-operation:
    - Drain hematoma
    - Suture ligation of bleeder
    - Cautery
    - Artificial hemostatic agents

Issues Related to Bandaging

- Purpose of bandaging
  - Coverage for prevention of wound contamination
  - Absorbs small volume post-operative bleeding
  - Provides compressive hemostasis
- Unique challenges in hot climates
  - Tape and adhesives bandages adhere poorly
  - Tape and adhesives don’t tolerated hot storage environments

Hemostatic Agents/Wound Closure/ Dressings for MC

Product Name	Dry surface needed	Form	Timing	FDA approved	Relative Cost	Action
Oxidized Cellulose (NuKnit)	no	Woven Gauze	3 min	FDA 1996	Mod	Hemostasis, Potential dressing
Synthetic 2-octyl/ cyanoacrylate (dermabond or liquid bandaid)	yes	Liquid	Dries in 1–2 min	Skin closure, External use only FDA 1998	Low/mod	Sealant
Fibrin sealant Crosseal (human fibrinogen,thrombin & synthetic tranexamic acid)	no	Liquid	Seals in 3 min	FDA 2003	high	Sealant
Collagen sponge with fibrinogen &thrombin (TachoSil)	no	Patch	3–5 min, apply with pressure		high	Hemostasis, Sealant
INSORB Subcuticular Stapler	no	Absorbed suture	Faster than suturing	yes	mod	Suture closure

Unanswered Questions Related to MC Hemostasis

Can the use of advanced technologies such as medical glues, absorbable “staples,” and impregnated dressings reduce procedure times and complications rates for traditional MC techniques? Or are they best used in a salvage setting where a bleeding complication has occurred?

Can the use of MC devices with retained rings at the suture line allow faster procedure times and superior hemostasis than traditional MC methods?

Overall Goals

Provide MC services that are safe, high quality, and cost-effective. In response, patients willingly participate and have a positive experience to communicate to their peers.

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