Foreskin Anomalies and Evaluation of Current Evidence on Circumcision

Christopher Lee
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Foreskin Anomalies

- Phimosis
- Paraphimosis
- Inconspicuous penile disorders
  - Concealed penis
  - Webbed penis
  - Trapped penis
  - Megaprepuce
Phimosis

- Refers to the partial or complete inability to retract the prepuce over the glans penis.
- Physiologic phimosis occurs due to natural adhesions between the glans and inner preputial skin and/or due to a preputial ring.
- Two factors are involved in separation of the prepuce from the glans:
  1. Epithelial debris (smegma)
  2. Intermittent penile erections
Approximately 96% of newborn boys have physiologic phimosis, although by 3 years of age 90% of foreskins can be retracted over the glans without difficulty; by the age of 17, less than 1% of men have phimosis. 1,2

• Maybe primary or secondary.
• Secondary causes:
  1. Forceful retraction of the prepuce (recurrent adhesions may form between the foreskin and denuded glandular tissue and propagate the formation of a cicatrix at the tip of the foreskin)
  2. Balanitis xerotica obliterans
Non-surgical Treatment

- The application of corticosteroid cream to the phimotic band 3 to 4 times per day has been shown to increase foreskin retractibility. 3
- Specifically, in a study of 70 boys aged 1 to 12 years, the application of betamethasone valerate 0.06% on this schedule resulted in a 81.3% response rate, as measured by an improvement in foreskin retraction. 3

Paraphimosis

- Paraphimosis is a urologic emergency in which the retracted foreskin of an uncircumcised male cannot be returned to its normal anatomic position.
- After being retracted for a prolonged duration, this causes venous occlusion, edema, and eventual arterial occlusion.
- Compromise of the arterial flow to the glans and constriction can cause gangrene and amputation of the glans penis.
Acute phase

Chronic severe form – process of glans autoamputation has begun
Management

- Any attempt to reduce paraphimosis in a child should be preceded by adequate sedation.
- Manual reduction under LA using dorsal penile nerve block and/or ring block by:
  1. Gentle compression and traction
  2. Multiple stabs to release edema fluid
  3. Dorsal slit over the constricting ring
- Granulated sugar or mannitol may help reduce the swelling.
- Temporary measures may be followed by formal circumcision
Inconspicuous Penis

- A group of conditions where the phallus appears to be diminutive in size. 4
  - Concealed penis
  - Webbed penis
  - Trapped penis
  - Megaprepuce

- The penis is normal in size but partially or fully obscured by the overlay of adjacent adipose or skin tissue.

• **Webbed penis**: the scrotal skin extends to form a web or flap of tissue on the ventrum of the penile shaft.

• **Trapped penis**: the phallus has become embedded in the suprapubic fat pad following circumcision (iatrogenic).
Concealed (buried) Penis

- Refers to congenital and acquired conditions whereby the phallus is retracted inward beneath the suprapubic fat pad and partially obscured by preputial skin. 5

- The congenital etiology of concealed penis is thought to result from:
  1. Poor elasticity of dartos fascia, restricting its ability to move freely through deep layers of tissue, and
  2. The lack of anchoring of the penile skin to deep fascia, which in turn limits extension. 6

In older or obese children, anatomical factors such as a pronounced suprapubic fat pad may obscure the phallus.
After the age of 3 years, spontaneous resolution is rare and surgical correction is indicated.

- It can hamper proper hygiene, trap urine, and complicate voiding – can lead to repeated infections, secondary phimosis, or urinary retention.
- Importance of being able to void while standing during the period of toilet training.
- Social embarrassment.
• Surgery involves dividing dysgenetic dartos bands and fixation of the dartos fascia to the Buck fascia dorsally in the midline, ventrally over the corpus spongiosum, and proximally along the penile shaft.

• Care must be taken to avoid injury to either the urethra or the neurovascular bundles.
Megaprepuce

- Megaprepuce is a congenital penile malformation that includes phimosis and severe ballooning of the internal prepuce due to excess inner foreskin mucosa.
- The penis is totally buried.
Megaprepuce

On micturition an evident pubic and scrotal swelling denounces the urine collection in an abnormal preputial cavity surrounding the entire shaft.
Circumcision

- Dates back more than 6000 years (oldest evidence on tomb artwork in Egypt 2345 – 2181 BCE).

- Theories on origin of circumcision:
  - Religious sacrifice
  - Rite of passage
  - Aid hygiene
  - A way to differentiate cultural groups
  - To discourage masturbation
Contraindications

- Penile conditions that require surgical correction
  - Hypospadias, penile curvature, dorsal hood deformity, webbed penis
- Large hydroceles or inguinal hernias
  - More likely to develop secondary phimosis, buried penis and trapped penis
- Coagulopathy
Potential Benefits

- Prevention of
  - penile cancer,
  - UTIs,
  - STDs including HIV and HPV
  - phimosis and
  - balanitis
Penile Cancer

- Carcinoma of the penis develops almost exclusively in men who are not circumcised at birth.
- Phimosis is a significant risk factor. 7
- Schoen reported that of 89 men in a large health maintenance organization with invasive penile cancer, only 2 had been circumcised at birth. 8

• Uncircumcised neonates and infants are predisposed to UTIs.

• In a study of 100 neonates with UTI, Ginsburg and McCracken found that only 3 (5%) of the 62 boys were circumcised. 9

• Wiswell studied more than 2500 male infants and found that 41 had symptomatic UTIs; 88% of these infants were uncircumcised. 10


Singh Grewal reviewed data on 402,908 children from 12 studies.

Given a risk of UTI in normal boys of about 1%, the numbers-needed-to-treat to prevent one UTI is 111.

In boys with recurrent UTI or high grade vesicoureteric reflux, the risk of UTI recurrence is 10% and 30% and the numbers-needed-to-treat are 11 and 4, respectively.

Clinical benefit is likely only in boys at high risk of UTI.

In a RCT of 2784 men in Kenya, Bailey et al demonstrated a lower incidence of HIV in circumcised men, with a protective effect of 60%. 12

On the contrary, Wawer et al discovered that circumcision of HIV-infected Ugandan men did not reduce HIV transmission to female partners. 13

Castellsagué et al discovered that male circumcision is associated with a reduced risk of penile HPV infection and, in the case of men with a history of multiple sexual partners, a reduced risk of cervical cancer in their current female partners. 14

Complications of Circumcision

- Bleeding
- Infection
- Insufficient, excessive or asymmetrical skin excision
- Glanular adhesions
- Skin bridges
- Meatal stenosis
- Penile trauma
- BXO
Controversies surrounding non-therapeutic circumcision in neonates
American Academy of Pediatrics Task Force on Circumcision

- 2012 – although health benefits (significant reductions in the risk of UTI, risk of heterosexual acquisition of HIV, and the transmission of other STDs) are not great enough to recommend routine circumcisions for all male newborns, the benefits of circumcision are sufficient to justify access to this procedure for families choosing it and to warrant third-party payment for it.
Pro-circumcision/ in support of AAP statement

- A risk-benefit analysis of conditions that neonatal circumcision protects against revealed that benefits exceed risks by at least 100 to 1 and that over their lifetime, half of uncircumcised males will require treatment for a medical condition associated with retention of the foreskin. 15

- This paper however was subsequently criticized as being “marred by bias” and “highly inaccurate”. 16, 17, 18

Contentions with the AAP recommendations

- In a stable Copenhagen population with on average 10,858 boys born each year between 1996 and 2014, only 53 boys needed a circumcision for medical reasons before age 18 years during the calendar year 2014. 19
- This indicates that approximately 99.5% of Danish boys will go through infancy, childhood, and adolescence without any medical need to be circumcised.

Contentions with the AAP recommendations

- While there may be a benefit for some boys in high-risk populations and circumstances where the procedure could be considered for disease reduction or treatment, the Canadian Paediatric Society does not recommend the routine circumcision of every newborn male.

Contentions with the AAP recommendations

- British Medical Association and NHS recommend circumcision only in children with medical indications, e.g., Phimosis, recurrent UTI, BXO, recurrent balanoposthitis, recurrent paraphimosis.

21, 22


Cultural bias

- Only 1 of the arguments put forward by the American Academy of Pediatrics has some theoretical relevance in relation to infant male circumcision; namely, the possible protection against urinary tract infections in infant boys, which can easily be treated with antibiotics without tissue loss. 23

- The other claimed health benefits, including protection against HIV/AIDS, genital herpes, genital warts, and penile cancer, are questionable, weak, and likely to have little public health relevance in a Western context, and they do not represent compelling reasons for surgery before boys are old enough to decide for themselves. 23

Complications

- Thorup et al evaluated 315 boys aged from 3 weeks to 16 years after circumcision (median five years).

- A total of 16 boys (5.1%) had significant complications:
  - three incomplete circumcisions requiring re-surgery,
  - two requiring resurgery six months and five years postoperatively due to fibrotic phimosis and
  - two requiring meatotomy due to meatal stenosis two and three year postoperatively.

- Acute complications included
  - two superficial skin infections one week postoperatively and
  - five cases with prolonged stay or re-admissions for bleeding the first or second postoperative day, whereof two underwent operative treatment.
  - two had anaesthesiological complications leading to a need for overnight surveillance, but no further treatment.

The Value of an Intact Sexual Organ

- One harm of circumcision that has been argued to be intrinsic to the procedure is the loss of healthy, functional tissue. 25
- The foreskin is a complex, double-layered structure, which protects the penile glans from environmental irritation, such as rubbing against diapers and clothing. 26
- This elastic, motile sleeve of tissue has recently been shown to be the most touch-sensitive part of the penis, composed of moist mucous membrane on the inside and a protective skin layer on the outside. 27
- It is rich in specialised nerve endings and sensory structures involved in the normal functionality of the penis. 28
- Circumcised men reported increased penile sensitivity and enhanced ease of reaching orgasm. 29

Conclusion

- Risk vs. benefit analysis suggests that neonatal circumcision should not be recommended for all infant males.
- Circumcision in children should only be performed for medical indications.
- Non-therapeutic circumcision should only be undertaken with adequate knowledge of the potential benefits vs. risk of harm.
- Caveat – recommendations may not apply in a Muslim society.
Thank you