Newborn Circumcision

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Mishaps are like knives, that either serve us or cut us, as we grasp them by the blade or the handle.

―James Russell Lowell

Learning Objectives:
1. Describe the benefits and risks of male circumcision.
2. Detail the 3 most common circumcision procedures.
3. Review anticipatory guidance regarding circumcision care.
4. Discuss the management of common circumcision complications, including when referral is indicated.
5. Describe how to care for the uncircumcised penis and how to counsel parents about delayed circumcisions.

Primary References:

CASE ONE:
You are meeting with new parents-to-be, Mr. and Mrs. Abraham for a prenatal visit. They are expecting their first child next month and are interviewing primary care physicians. As they are expecting a boy, they have lots of questions about circumcision.

1. What is male circumcision? Who performs the procedure?

Male circumcision is the removal of some or all of the foreskin of the penis. The exact rate of circumcision remains difficult to assess, as many circumcisions are performed in the community by ritual circumcisers as part of religious and/or cultural customs. The CDC reports that the rate of in-hospital circumcision in the United States was 58.3% in 2010, which is an overall decrease from a rate of 64.5% in 1979. Circumcision trends vary regionally within the US, from a low of 40.2% of newborn males in the West to 58.4% in the South, 66.3% in the Northeast, and 71.0% in the Midwest as of 2010. In-hospital circumcision rates are higher in top income quartiles, in rural areas, and among privately-insured patients. Worldwide, rates of circumcision vary widely, from 5% to over 90% depending on region. The most common reasons parents cite for choosing to circumcise are the perceived health benefits (40-67%), followed by cosmetic reasons (23-37%), and lastly by religious requirements (11-19%).

Newborn circumcision procedures are performed by pediatricians, family practitioners, obstetricians, and ritual circumcisers. Nationally, about 1/3 of pediatricians perform circumcisions, while closer to 2/3 of family practitioners and obstetricians do so. In a survey published in 1998, only 43% of responding pediatric residency programs provided training in circumcision while 95% of family practice and 84% of obstetric programs provided training. It is imperative that all providers of newborn care are familiar with circumcision techniques as well as common complications and their management.

2. What are the benefits, risks, and controversies surrounding newborn male circumcision?

In 2012, the AAP revised their policy statement on newborn circumcision, stating, “Evaluation of the current evidence indicates that the health benefits of newborn male circumcision outweigh the risks and that the procedure’s benefits justify access to this procedure for families who choose it.” This stance represents a shift in AAP policy based on data available since its previous iteration in 1999. The updated
AAP policy is endorsed by the American College of Obstetricians and Gynecologists and its development included representation from the CDC and American Academy of Family Physicians.

Literature has supported a protective effect of male circumcision in:

- HIV acquisition among heterosexual males, particularly in areas with high HIV prevalence
- human papillomavirus infection (HPV)
- herpes simplex virus type 2 transmission
- bacterial vaginosis in female partners
- urinary tract infection (UTI) in the first 2 years of life

Circumcision reduces the quantity of pathogens that can aggregate under the prepuce, which likely contributes to the decreased rate of UTIs in childhood and the decreased rate of sexually transmitted infections among adult males. The foreskin is also susceptible to small tears and abrasions, particularly during intercourse, which may serve as sites of pathogen entry. Circumcision may offer protection from invasive penile cancer, although data are conflicting. While studies regarding sexual satisfaction are inherently flawed, there exists good evidence that there is no impaired sexual satisfaction or sensitivity among males circumcised as infants, however circumcision as an adult may decrease penile sensitivity.

While there is usually no acute medical indication for males to be circumcised as neonates, the procedure is typically performed in this time period because the rate of complications increases by 10- to 20-fold for circumcisions performed after 1 year of age. Additionally, local agents are sufficient for analgesia in the neonatal period, whereas general anesthesia is required at older ages. Acute and subacute medical indications for circumcision in older children include phimosis, paraphimosis, and recurrent UTI. A study from Denmark, where nonritual circumcision is performed only for medical indications, found an incidence of male circumcisions of 1.7%. Contraindications to circumcision at any age include medical instability, bleeding dyscrasias, and congenital anomalies of the penis. In addition, circumcision may need to be deferred in preterm or small for gestational age (SGA) infants due to the technical challenges of performing circumcision on particularly small penises.

Complications from circumcision are rare, estimated to be between 0.19% and 0.22% of all neonatal male circumcisions performed in hospitals. While the most common post-procedure complication is bleeding, which occurs in approximately 0.1% of circumcisions, this is usually easily controlled. Parents are often concerned about their neonate’s experience of pain during the procedure, however studies have shown that using a combination approach to analgesia (see below) results in minimal pain. Other acute complications include infection (0.06%) and penile injury (0.04%). A 2016 retrospective study which reviewed 95,046 circumcisions found a readmission rate of 0.3% and a reoperation rate of 0.1% for boys from birth to 18 years of age. Late complications include adhesions, phimosis, poor cosmetic outcome, inclusion cysts, meatal stenosis, urinary retention, and meatal stenosis. Rare reports have been made of circumcision leading to penile necrosis, amputation of the distal portion of the glans penis, and urethral fistula.

While the complication rate of male circumcision is higher in resource-poor countries (ranging from 2% in infants to 6-14% in children), the potential benefits of male circumcision are more pronounced. In 2007, the WHO recommended that voluntary male circumcision be included as part of a comprehensive HIV prevention strategy, with inclusion of boys in the decision-making process when old enough to participate. In resource-rich countries, the potential medical benefits are closely matched by the procedural risks of circumcision; consequently, the AAP 2012 statement concludes that the health benefits are not significant enough to warrant routine male circumcision and the ultimate decision should be made by parents.

The ethical debate of neonatal male circumcision is also important to note. Many question the ethics of performing an elective surgical procedure in an infant who is unable to consent, though this is balanced against performing the procedure when the risk of complication is lowest. Those opposed to circumcision emphasize that the most pronounced benefits of male circumcision have been seen in low-resource countries and that these have been less robustly documented in resource-rich countries. The decision to circumcise is heavily influenced by cultural and religious beliefs. In a 2010 study by Wang, et al., parental views on circumcision were most influenced by personal, cultural, and religious views, even in the face of professional society recommendations and scientific data. Accordingly, the AAP’s 2012 policy
 Describe the most common circumcision procedures and analgesic techniques. What are the most common acute complications from circumcision and how should these be managed?

The AAP policy statement recommends appropriate analgesia be provided for all circumcision procedures. Available mechanisms of analgesia include dorsal penile nerve block (DPNB), ring block, and lidocaine-based anesthetic creams. The DPNB is performed with one or two injections of lidocaine along the dorsum of the penis whereas the ring block is performed with circumferential injections along the base of the penis. A 2004 Cochrane review on pain relief for neonatal circumcisions concluded that DPNB is the most effective form of analgesia. Sucrose solutions are appropriate to use as adjunctive pain therapy but not adequate to use as the sole analgesic. Performing the procedure without analgesia is associated with an increased risk of gagging, choking, and emesis. Rarely, lidocaine injections can cause bleeding, swelling, and hematoma formation, while topical agents can cause local skin irritation (particularly in low birth weight infants). In total, the benefits of local anesthesia far outweigh the risks.

The two approaches for circumcision are either complete removal of the foreskin at the time of circumcision, or placement of a circumcision device to cause local tissue devitalization and separation over the course of several days. The Mogen clamp and the Gomco clamp are the two most common instruments used to remove foreskin during “sharp circumcision” procedures; the Plastibell is the most common “in situ” device. No approach has been shown to be clearly superior; the choice of technique is generally dictated by provider preference.

Regardless of the mechanism of neonatal circumcision performed, it is recommended that the infant be placed on a positioning board to optimize visualization and avoid unexpected movements that may interfere with the procedure. The glans should be inspected to make sure that the urethral meatus is appropriately located and there are no penile anomalies. The initial steps of the procedure are the same for all of the above techniques: after applying anesthesia and sterilizing the surgical field, the foreskin is stretched and a straight clamp is used to bluntly dissect adhesions between the foreskin and the glans.

The Mogen clamp is available in hospitals and is the most common method used in traditional Jewish circumcision rituals. The Mogen clamp is a hinged metal device with a groove for glans protection. Adhesions between the foreskin and glans are carefully released so that the glans is free and cannot be entrapped in the device, and then the foreskin is stretched and the opening of the Mogen clamp is slid along the base of the released foreskin. The clamp is closed and locked to devitalize the tissue, the distal foreskin is removed with a scalpel, the clamp is opened, and the residual foreskin is retracted from the glans. The Mogen clamp can only open 3 mm to avoid major glans entrapment and potential amputation. The Mogen is the fastest of the above methods and unlike Gomco and Plastibell circumcisions, assessment of glans size is not required for use.

For the Gomco circumcision, after release of adhesions, a straight clamp is then used to compress the tissue of the stretched foreskin at 12 o’clock extending from the edge of the foreskin to the border of the glans and the penile shaft. This region of compression is then incised. The metal bell of the Gomco is then placed over the glans and the foreskin is pulled up over the bell. Several different sizes of the bell exist to accommodate different glans sizes. A specialized clamp is placed over the bell and foreskin, then tightened to achieve hemostasis. The foreskin is excised with sharp scalpel dissection; electrocautery should never be used, as this can result in transmission of the current to the shaft of the penis and cause excessive tissue necrosis or complete penile amputation. The clamp is then removed and the bell carefully separated from the residual prepuce. Because the bell protects the underlying glans and no device remains on the penis, injuries to the glans and late complications are rare; however, some find the device cumbersome due to its various components and requirement for sizing of the glans.

The Plastibell circumcision is initially performed in a similar manner to that described above with the Gomco circumcision. After the dorsal incision, the Plastibell is placed over the glans. The Plastibell ring should be appropriately sized so that the bell covers most of the glans without being too tight or too loose. The foreskin is then pulled up over the Plastibell. A moistened suture is tied around the foreskin along the groove of the Plastibell. A surgeon’s knot should be used to achieve adequate hemostasis and...
tissue strangulation. The excess foreskin can be trimmed and the handle of the Plastibell removed. At the completion of a Plastibell circumcision, the Plastibell ring (minus handle), residual foreskin, and suture remain on the glans. The Plastibell should be checked to make sure that it is mobile over the glans, does not occlude the urethral meatus, and that there is full circumferential strangulation of residual foreskin. The devitalized tissue distal to the ligature will usually separate within several days, after which time the remainder of the device can be removed. As with the Gomco clamp, the Plastibell includes a bell that protects the glans and minimizes injury. Each device is single-use and disposable, however given that the device remains in situ there is a risk of delayed edema of the penis which can compromise perfusion and urination; adequate access to follow-up is therefore required for use.

Since the most common complication from circumcision is bleeding (0.1%), the AAP recommends waiting until the neonate has received vitamin K prior to performing the procedure. The incidence of bleeding is largely comparable between the different methods. Direct pressure alone can stop most bleeding. For mild bleeding, hemostatic agents (such as thrombin, Surgicel, or Gelfoam) can be applied to promote coagulation. Lastly, a fine absorbable suture can be used to ligate focal areas of bleeding, taking care to avoid the urethra. Infection after circumcision occurs in fewer than 0.1% of cases and is usually able to be managed with topical antibiotic ointments. Ulceration, suppurative, and systemic infections are rare after circumcision. Partial or complete amputation of the glans can very rarely occur from incorrect surgical technique; if this happens, the tissue should be placed on ice and the patient immediately transported to a facility capable of emergent urologic surgical management, as reattachment may be possible if performed expeditiously.

CASE continued:

| Mrs. Abraham gives birth to a healthy 3.5 Kg male infant, Isaac, and decides to circumsise him. A circumcision is performed without problems and the Abrahams are preparing to head home. |

4. What guidance will you give Mr. and Mrs. Abraham about the care of their son’s circumcision?

The newly circumcised glans often appears red and raw from the lysis of adhesions, which can be distressing to some parents. When cleaning, the penis should be washed gently without significant traction on the skin. There may be some swelling of the glans that peaks 24 to 48 hours after the procedure, as well as some fibrinous exudate as the glans heals. Despite the proximity of the newly-circumcised penis to fecal matter, infection is rare. Signs of infection include erythema, edema, purulent discharge, and pain, which can often be identified by worsening of symptoms after 48 hours instead of improvement. Parents should be instructed to change the baby’s diaper frequently while the penis is healing and to promptly, but gently, wipe off any stool that gets on the penis with warm water and soap.

If a sharp circumcision (Gomco or Mogen) has been performed, the parents should be instructed to apply a thick layer of petroleum jelly on a gauze pad over the penis tip with each diaper change. In an Iranian study, the use of petroleum jelly to protect the healing glans resulted in fewer cases of meatal stenosis. Parents should be informed that small amounts of oozeing are acceptable but if bleeding is more profuse, they should seek medical attention.

Use of petroleum jelly is not necessary for Plastibell circumcision, as the Plastibell prevents the glans from adhering to the diaper and protects the urethral meatus from stenosis. However, parents should inspect the Plastibell to make sure it does not slip down onto the shaft of the penis. The glans usually swells within the first 48 hours after the procedure; with the Plastibell in place, parents should be instructed to note any difficulties passing urine or more than minimal pain with movement of the penis, both of which may indicate strangulation of the glans in the Plastibell.

CASE continued:

| The Abrahams return with Isaac for his newborn visit. He is breastfeeding and gaining weight well. |
5. Along with your routine newborn anticipatory guidance, what will you look for regarding the Plastibell circumcision? What guidance will you provide? How would your evaluation and advice differ if a sharp circumcision had been performed?

The Plastibell should be inspected for evidence of circumferential necrosis in the area between the suture and the cut surface; if there is still viable tissue, the Plastibell suture may need to be re-tied. Occasionally the initial surgeon’s knot has slipped, not been adequately tightened, or improperly placed (i.e. not in the groove of the Plastibell). In this case, a second suture can be tied over the first along the groove of the Plastibell, taking care not to overlie the original knot. Alternatively, if the viable tissue is a narrow stalk, the resultant skin tag of distal foreskin can simply be tied off. The Plastibell should be assessed to make sure that it is mobile but has not migrated down onto the shaft of the penis. The Plastibell should fall off within 5 to 7 days after placement. There may be minimal spotting or oozing when it detaches. If the bleeding is more significant, then the infant should be evaluated.

Follow up of a sharp circumcision entails inspection of the penis for any evidence of infection or continued bleeding. Parents should be reminded in the use of petroleum jelly and gauze to protect the healing glans from adhering to the diaper until approximately 1 to 2 weeks after the circumcision, by which time the skin of the glans has typically epithelialized.

6. What late complications of newborn circumcision should you keep in mind as the Abrahams leave your office? How will you manage these?

The true incidence of late circumcision complications is difficult to estimate because, as mentioned above, the incidence of circumcision in the US is unknown. The most common late complications are excess residual skin (incomplete circumcision), excessive foreskin removal, adhesions, phimosis, meatal stenosis, and epithelial inclusion cysts. Minor adhesions are often found between the inner prepuce and the glans; these either result from incomplete lysis of adhesions at the time of circumcision, or from exposure of raw serosal surfaces during healing. These adhesions will usually resolve with time or can be gently separated in the office using gentle traction followed by the application of topical petroleum jelly to prevent re-formation of adhesions. Excess skin removal can usually be managed conservatively with wet-to-dry dressings or antibiotic ointments while the denuded area heals by secondary intention.

Complications that require referral to pediatric urology for surgical management include redundant foreskin, meatal stenosis, skin bridges (dense adhesions which can cause tethering and deformation of the penis), urethrocystaneous fistula, epidermal inclusion cysts, and cicatrix (scar at the incision line which can prevent exposure of the penis).

CASE TWO:

| The Skins are referred to you by the Abrahams. Their infant son, Peter IV, was born at 36 weeks and they were told that his penis was “too small” for circumcision. Mr. Skin is now reconsidering circumcision for Peter IV. |

7. What advice will you give parents regarding management of the uncircumcised newborn penis? How will you respond to the father’s question about timing of circumcision?

Parents should be instructed that the infant foreskin only requires gentle washing of the external surfaces with soap and water. Attempts at forcibly retracting the foreskin should be discouraged as such retraction can cause pain, bleeding, worsened phimosis, or paraphimosis if the foreskin is successfully retracted but then cannot be replaced.

At birth, only 4% of newborn male infants have a completely retractable foreskin. The typical physiologic phimosis resolves by 3 years of age in 90% of boys. In children with persistent physiologic phimosis beyond the ages of 4 to 5 years, there is considerable debate about whether this requires circumcision or will resolve as boys enter puberty. In one study, the remaining 10% of male children with phimosis beyond 5 years of age had resolution by their teenage years.

As previously noted, circumcision may be delayed in certain preterm or SGA infants. If circumcision is not performed during the immediate neonatal period or hospitalization, then it is typically performed...
under general anesthesia by pediatric urologists or surgeons. As a result, the procedure is usually delayed until 6 months of age when the risk of general anesthesia is acceptable. Circumcisions performed on children older than 3 months have a higher rate of immediate complications, most commonly bleeding due to larger cutaneous vessels in the foreskin, and may require additional hemostatic interventions.

**Additional References:**

Resources:
1. AAP parent handout “Caring for your son’s penis”
   http://www.healthychildren.org/English/ages-stages/baby/bathing-skin-care/Pages/Caring-For-Your-Sons-Penis.aspx

Editor’s Note:
There are numerous devices available for circumcision. While we avoid using name brands in the curriculum in general, we use them in this chapter due to their common usage by health care providers and lack of adequate method to differentiate among available devices using “generic” names.

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