

## Non-Newborn Circumcision

**Learning Objective:** At the conclusion of this continuing medical education activity, the participant will be able to detail indications for non-newborn circumcision, compare techniques for performing non-newborn circumcision and discuss the frequency and management of common circumcision complications.

This AUA Update aligns with the American Board of Urology Module on Core/General Urology. Additional information on this topic can be found in the AUA Core Curriculum sections on Pediatric Urology and Sexual Medicine and Andrology.

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## INTRODUCTION

Circumcision is a surgical procedure during which the foreskin (prepuce) is removed from the penis. Circumcision is one of the most commonly performed urological procedures. While often performed for medical purposes, the procedure also carries with it complexities related to cultural and religious beliefs and practices.

**In the United States, approximately 80% of males are circumcised.<sup>1-4</sup> Most undergo newborn circumcision; currently, ~55% of boys are circumcised during the newborn period (between 0–30 days old).<sup>5</sup>** Circumcisions are performed beyond the newborn period for both medical and nonmedical indications, detailed below. In the health care setting, newborn circumcisions are typically performed by non-urologist practitioners, including obstetricians, family medicine physicians and pediatricians. Circumcision practitioner specialty changes as boys get older: non-newborn pediatric circumcisions are more commonly performed by urologists and pediatric surgeons, and adult circumcisions are almost exclusively performed by urologists in the U.S.<sup>6</sup> Circumcisions are also performed in nonmedical settings, usually in the context of religious or cultural ceremonies.

Routine newborn circumcision has been a hotly contested and frequently discussed health care intervention, with recommendations in the U.S. evolving over time.<sup>7,8</sup> The 1975 American Academy of Pediatrics (AAP) Circumcision Task Force report stated there was “no absolute medical indication” for routine newborn circumcision.<sup>9</sup> The AAP position evolved over time as updated data emerged. In 2012, the AAP Task Force stated that “benefits of newborn circumcision outweigh the risks,” that families who opt for newborn circumcision should have access to the procedure, and that the benefits warrant insurance coverage for the procedure.<sup>10</sup> **However, circumcisions are performed beyond the newborn period for a variety of reasons, including deferment due to patient factors at birth, lack of access to newborn circumcision, parental choice, and religious or cultural preferences.**

While the 2012 AAP Task Force provides guidance for newborn circumcision, indications for, and optimal timing of, circumcision beyond the neonatal period remain controversial. Although health benefits of circumcision are maximized if done in the newborn period, most benefits extend beyond the neonatal period, and many are not realized until adolescence or adulthood. **Circumcised boys experience decreased incidence of febrile urinary tract infections during infancy<sup>11</sup> and near-elimination of the risk of balanitis, posthitis and symptomatic phimosis.<sup>10</sup> Circumcised adolescents and adults also experience reduced human papilloma virus risk, increased clearance of high-risk strains of human papilloma virus, markedly reduced risk of penile cancer, decreased prevalence of HIV and reduction in HIV transmission.<sup>12</sup>**

In this update, we review indications for non-newborn (infant, pediatric and adult) circumcision, discuss circumcision techniques and options for analgesia, review circumcision complications and their management, and discuss legal and ethical concerns regarding elective genital procedures in children.

## INDICATIONS FOR NON-NEONATAL CIRCUMCISION

**Reasons for circumcisions performed beyond the newborn period include inability to obtain a desired newborn circumcision, parent preference for elective circumcision later in infancy or childhood, development of symptomatic phimosis or related issues, or a decision by an adolescent or adult to undergo circumcision for cosmetic or infection prevention purposes.** A recent study examining circumcisions performed at children’s hospitals from 2010–2017 found that half (50%) of circumcisions performed were performed during the neonatal period, with 17% performed during infancy, 18% during early childhood and 16% in late childhood/adolescence.<sup>6</sup>

*Delay of desired newborn circumcision.* In the U.S., parents of newborn boys typically express a clear desire for or against routine circumcision. Though cultural and religious traditions typically are the strongest drivers of the circumcision decision, medical benefits do exist, as detailed in the Introduction. **For parents who desire a circumcision for their infant boys, the safest, most cost-efficient procedure is a circumcision under local anesthesia in the first days or weeks of life.<sup>13,14</sup>** This early timing is possible for many baby boys, but not all.

Some baby boys are born with a clear anatomical or medical contraindication to newborn circumcision (table 1).<sup>15,16</sup> In addition to well-established contraindications, some practitioners will not perform newborn circumcisions on baby boys with hyperbilirubinemia due to concern for increased bleeding risk, though data to support this practice are limited.<sup>17</sup>

For boys who have a medical concern, including patient size or prematurity, a clamp circumcision can sometimes be performed at several months of life, thus avoiding general anesthesia. However, there is a lack of consensus about criteria to determine when the transition from local circumcision to operative circumcision should occur. In one study of infant boys for whom a neonatal circumcision was desired but not performed, 29% of patients (59/206) were deemed eligible for local, in-office circumcisions based on weight and age criteria. These patients ranged in age from 0.3 to 4.9 months with a median of 2.7 months.<sup>18</sup> **When infants are not referred in time to meet the practitioner’s criteria for a clamp circumcision under anesthesia, or if they have an anatomical abnormality, then an operative circumcision is necessary. Operative circumcision (with reconstruction of genitourinary anomaly, when indicated) typically occurs under general anesthesia at ~6–18 months old.**

Along with boys who have a clear anatomical or medical contraindication to newborn circumcision, healthy boys with normal anatomy also present to pediatric urologists and surgeons for elective circumcision later in infancy or young childhood. Administrative database studies and parent surveys provide some insight about why boys who did not have a contraindication to newborn circumcision underwent a non-neonatal procedure. These studies indicate that reasons for later elective circumcision are frequently related to health care access concerns and are less commonly related to issues such as adoption or parents being unsure about whether they want a circumcision at the time of birth.<sup>19,20</sup>

**Data from the last several decades have consistently demonstrated that difficulties in newborn circumcision access are more concentrated amongst boys of lower socioeconomic status.**<sup>19,21–23</sup> These disparities in access to neonatal circumcision appear to have persisted beyond the 2012 AAP statement supporting third party payment for newborn circumcision.<sup>21</sup> Furthermore, a recent study demonstrates that lack of public insurance coverage for newborn circumcision disproportionately impacts Black/African American boys. When Medicaid coverage was available, Black/African American neonates had higher odds of circumcision vs White neonates (adjusted odds ratio [aOR] 1.44 [1.42–1.46]). When Medicaid coverage was not available, Black/African American neonates had lower odds vs White neonates (aOR 0.40 [0.39–0.41]). Even in states where both public and private insurance companies provide newborn circumcision coverage, operative circumcisions under general anesthesia are still reimbursed more generously than newborn circumcisions.<sup>13,22</sup> Thus, hospitals and individual physicians have a financial incentive to provide non-newborn circumcisions, and little external motivation to provide efficient, comprehensive access to newborn circumcisions for desirous families.

*Cultural preference for delayed circumcision.* In some cultures, ritualistic (traditional) male circumcision is performed as a rite of passage. These procedures are typically performed as part of a large, public ceremony marking transition from boy to man.<sup>24</sup> Ritualistic circumcision should be distinguished from medical circumcision, in that ritualistic circumcisions typically involve removal of less tissue and have not been shown to decrease risk of HIV in the same manner as medical circumcisions. These ritualistic circumcisions do provide an interesting opportunity for partnership between medical professionals and ceremonial circumcision practitioners to increase safety, provide for a plan if complications arise and offer the potential of a medical benefit in addition to the cultural one.<sup>25</sup> Anecdotally, some parents in the U.S. also express a desire for a circumcision for their son in later infancy or childhood due to the concern that the child is “too small” or “too fragile” to have a newborn circumcision, or due to cultural preference for a later procedure due to identifying with a culture that typically performs ritualistic circumcision.

**For boys and men with normal penile anatomy who are uncircumcised due to preference or medical comorbidity, or lack of availability to circumcision in the neonatal period, circumcision is typically performed for symptomatic concerns. Symptoms attributable to the prepuce can include urinary tract infections, balanitis and posthitis, pain with retraction or erections (including frenular tethering). A trial of topical steroid cream is often prescribed for patients with phimosis-related symptoms, with success rates of ~60–90%.<sup>26,27</sup> Circumcision may be elected for symptomatic patients who fail a trial of topical steroid, or who after counseling prefer surgical treatment.** Additionally, some adolescents and young adults may not have foreskin-related symptoms, but may prefer a circumcised penis for reasons of culture, religion or cosmesis.

*HIV prevention in high prevalence areas.* **Three large randomized control trials in South Africa, Kenya and Uganda demonstrated that wide-scale circumcision for medical purposes reduces the risk of HIV among circumcised males (~55%–60% protective effect in these studies).**<sup>18,28,29</sup> Given this, there have been coordinated efforts to implement safe, efficient circumcision programs in countries with high HIV prevalence.

Standards and procedures have been developed, and strategies for dissemination have been explored. Researchers have been critiqued for extrapolating the HIV risk reduction data from African countries to the U.S. context, as prevalence rates here in the U.S. are lower. However, particularly among certain high-risk populations (including African American and Latino men), circumcision is a cost-effective HIV prevention strategy, particularly if utilized in combination with other efforts such as safer sex practices.<sup>30</sup>

## TECHNIQUES & ANALGESIA

Circumcision methods can be separated into 2 categories: those performed with and without the use of a clamp. Another important distinction is whether the procedure is to be performed under local or general anesthesia. **In the U.S., clamp devices are typically used for newborn and (sometimes) older infant procedures. Many international circumcision programs also describe use of clamp devices for older children and adults. Newborn circumcisions are typically performed under local anesthesia, which is also an option for cooperative adults. Most older infants, children and many adults undergoing circumcision in the U.S. receive a general anesthetic.**

*Clamp techniques.* General steps in clamp circumcision include: assessment of the amount of skin to be removed, dilation of any phimosis and isolation of the glans, disrupting physiological adhesions between the glans and the inner foreskin, placing the clamp (may require a dorsal slit), achieving hemostasis by leaving the device in place for a period of time, and then removing the foreskin.<sup>10</sup> Many different clamp devices are available worldwide (table 2). **In the U.S., the most commonly used clamps are the Gomco (Allied Healthcare Products, St. Louis, MO), Plastibell™ (Hollister Incorporated, Kirkville, MO) and Mogen (Sklar Surgical Instruments, West Chester, PA).**

In a recent survey of 79 pediatric urologists, the majority (68%) reported using a Gomco clamp for newborn circumcision, while 28% used the Plastibell and 9% reported using the Mogen clamp.<sup>17</sup> The Gomco clamp is a metal device composed of a bell clamped to a metal base plate which traps the foreskin, which is then excised. The Gomco clamp is available in a variety of sizes and used internationally for adult circumcisions; however, is generally used to perform newborn and infant circumcision under local anesthesia in the U.S.<sup>31,32</sup> When used on newborns or infants, sutures are rarely needed for approximation of the skin-mucosal edges, but in older children or adults, suture or skin glue may be used to prevent wound dehiscence. The Plastibell is a disposable plastic device inserted under the foreskin and used almost exclusively in newborns and infants. Once the device is placed, a ligature is secured surrounding the foreskin and the excess skin is trimmed. A ring with the accompanying ligature is left in place for 3–4 days until it spontaneously detaches or is removed by a health care professional.<sup>33</sup> The Mogen clamp is a reusable 1-piece instrument, also limited to use in neonates or infants, that achieves hemostasis by crushing the foreskin after it has been brought distal to the glans. The prepuce is then excised.<sup>32</sup>

There has been a recent emphasis on simple-to-use clamps and other devices to assist with adult male circumcision programs in areas with minimal access to health care. **Devices include single use *in situ* clamps such as the ShangRing (Wuhu Snnda Medical Treatment Appliance Technology, Wuhu, China) and**



**PrePex™ (Circ MedTech, Hod Hasharon, Israel).** These ring devices are both World Health Organization (WHO) prequalified and U.S. Food and Drug Administration approved for use in adults. The devices are placed distal and proximal to the foreskin to provide hemostatic occlusion. With the ShangRing, the foreskin is excised at the time of ring placement, and the device is left in place until it either spontaneously detaches or is removed by a health care practitioner a few days later.<sup>34</sup>

The PrePex is similar in mechanism; however, the foreskin is left to necrose and detach spontaneously. The device itself is removed, along with delayed excision of the necrotic foreskin if it remains in place, on approximately postoperative day 7.<sup>35</sup> Both may be applied and removed under local anesthesia. A large meta-analysis of 10 randomized controlled trials including 4,649 patients concluded that both the ShangRing and PrePex *in situ* devices have significantly shorter operative time, less incidence of wound bleeding and less blood loss at the time of the procedure when compared to conventional circumcision.<sup>36</sup>

**A similar *in situ* device is the Alisklamp (Abagrup Health Services Ltd., Ankara, Turkey), utilized in both pediatric and adult circumcisions.** The clamp is placed onto the glans, pulling the foreskin over the device surrounding the glans. The device is then tightened, and the foreskin is excised. The entire apparatus remains in place for 4–5 days after the procedure. When compared to conventional circumcision, complication rates for the Alisklamp were higher (3.2% vs 0.96%, respectively). The most frequently noted complication for Alisklamp patients was buried penis or redundant foreskin.<sup>37</sup>

**Another class of devices to assist in circumcision are circular stapling devices and disposable clamp devices that do not require appliance removal after the procedure.** The Unicirc® (UNICIRC Global, Western Cape, South Africa) is essentially a single-use Gomco clamp for adult circumcision. The difference lies in a transparent plastic (vs metal) bell that is placed over the glans. Similar to the Gomco, the Unicirc fuses the proximal edge of the prepuce to the shaft skin, and is removed after 5 minutes along with the foreskin, which is sharply excised. Skin edges are then sealed with cyanoacrylate skin glue. There are no follow-up visits needed for device removal. In one randomized controlled trial with 75 patients over 16 years of age, operative duration and intraoperative blood loss were significantly less in the Unicirc group vs those who underwent conventional circumcision. Patients also reported improved cosmesis and more rapid wound healing when compared to conventional circumcision.<sup>38</sup>

**The Circular Stapler (Henry Medical Device Company, China) is an all-in-one device that clamps, excises, and closes the wound with a small line of anastomotic staples, using a mechanism similar to a bowel anastomotic stapler.**<sup>39</sup> The staples may fall off spontaneously after about 10 days; however, often require removal by a health professional. When compared to conventional circumcision, the Circular Stapler had significantly lower operative times, blood loss, intraoperative and postoperative pain, and lower complication rates (2.7% vs 7.8%, respectively,  $p < 0.01$ ).<sup>36,40</sup>

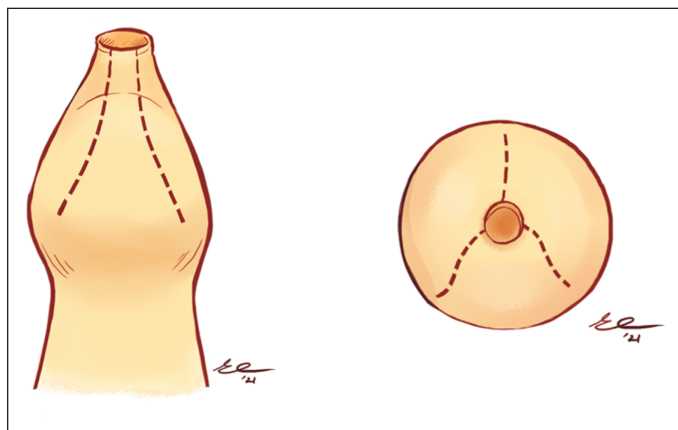
**Sleeve technique.** For older children and young adults, clamps are typically used less frequently to allow for a tailored approach to each circumcision and to account for variations in anatomy. **The most commonly used operative circumcision technique is the sleeve, or “double incision,” approach.** This is performed by making an inner and outer incision on the foreskin, dissecting it free, and sewing the residual shaft skin to the preputial collar

using absorbable suture. Alternative wound closures including skin glue<sup>38</sup> and barbed subcuticular suture<sup>41</sup> have been used with satisfactory results in both pediatric and adult patients. Sleeve circumcision allows for correction of mild penile torsion and concurrent frenuloplasty, which is not possible with a clamp circumcision.<sup>42</sup>

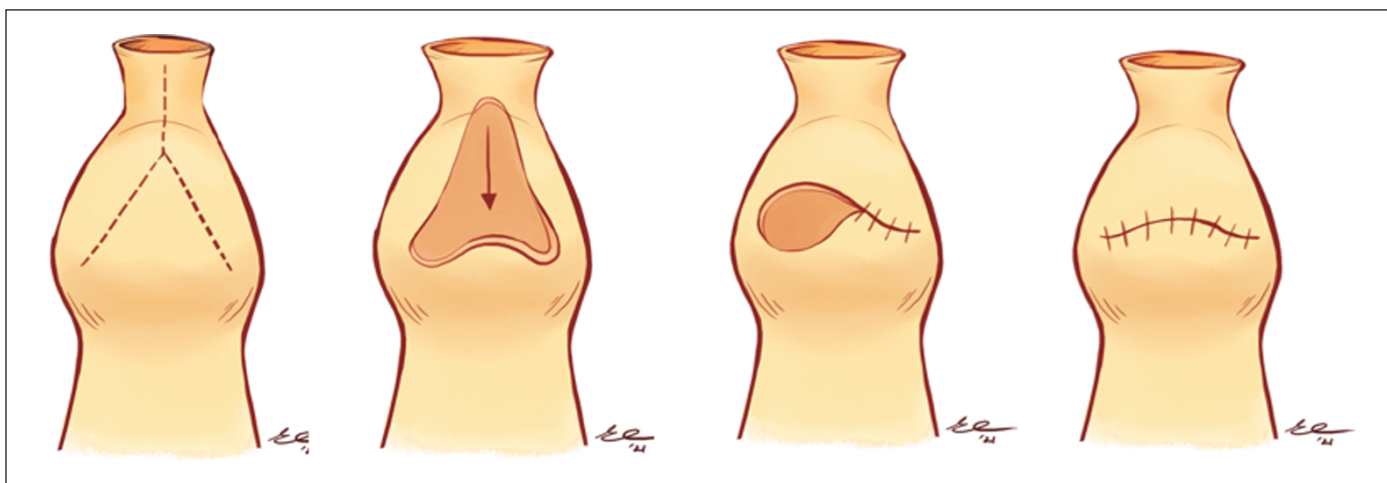
**Alternative techniques: dorsal slit, preputioplasty.** A dorsal slit may be performed as an adjunct to a clamp or sleeve circumcision (to provide access to the glans) or as a standalone procedure to address phimosis or paraphimosis. After performing a dorsal slit, the distal prepuce can then be trimmed to complete a circumcision. **If the patient or their parents desire treatment of phimosis or paraphimosis but do not wish to appear circumcised, dorsal slit or preputioplasty can be employed.** Preputioplasty involves reducing the preputial tissue while leaving the foreskin itself in place, and can be done by triradiate incisions (fig. 1) through a phimotic band or via a Y-V plasty (fig. 2).<sup>42</sup> Leaving the preputial tissue behind does place the patient at risk for recurrence of phimosis and development of balanitis. In one retrospective study, 70% of patients who underwent preputioplasty during childhood had recurrent balanoposthitis.<sup>43</sup>

**Anesthetic types. In the U.S., non-newborn circumcisions are typically performed in the operating room under general anesthesia.**<sup>20</sup> Local and regional anesthetic techniques are also used, either alone or as an adjunct to the general anesthesia.

**Local Anesthesia (penile block): While non-newborn circumcisions are often performed under general anesthesia in the U.S., adolescent and adult circumcisions are commonly performed under local anesthesia in the international setting. The WHO recommends performance of adult and adolescent circumcision under local anesthesia (either ring block or a dorsal penile nerve block).**<sup>33</sup> Historically, local anesthetic agents with epinephrine have been avoided due to the risk of vasoconstriction and gangrene. However, a retrospective study of 95 patients aged 3 to 87 years who underwent circumcision under local anesthesia with epinephrine showed no episodes of necrosis or concern for diminished perfusion.<sup>44</sup> The WHO recommends use of 0.5%, 1% or 2% plain lidocaine with a maximum dose of 3 mg lidocaine/kg of body weight. Complications associated with a dorsal penile nerve block can include hematoma, distortion of anatomical landmarks, local anesthetic systemic toxicity (LAST), and lack of thorough analgesia of ventral penis.<sup>45</sup>



**Figure 1.** Preputioplasty with triradiate incisions. Adapted from *Hinman's Atlas of Urologic Surgery*.<sup>42</sup>



**Figure 2.** Preputioplasty with Y-V plasty. Adapted from *Hinman's Atlas of Urologic Surgery*.<sup>42</sup>

Regional Anesthesia (spinal): **Spinal anesthesia is gaining popularity as a means of decreasing exposure to general anesthesia during urological procedures, especially for pediatric patients.** In a large retrospective case series, infants 1–14 months old undergoing a variety of urological penoscrotal procedures (circumcision, orchidopexy, hypospadias repair) under spinal anesthesia had prolonged postoperative pain control and decreased lengths of stay compared to historical general anesthesia controls.<sup>46</sup> Spinal anesthesia for circumcisions in older children, adolescents, and adults has not been specifically evaluated, but could be an appropriate option in select patients in centers with experienced anesthesiologists.

## COMPLICATIONS & MANAGEMENT

True complication rates after circumcision are somewhat difficult to quantify due to the conflicting definitions of complications (eg acute clinical events such as bleeding or infection vs more cosmetic concerns such as inadequate skin removal) and variable durations of followup in the literature. Further confounding factors include the practice of circumcision globally by both trained and untrained clinicians as well as traditional practitioners in a variety of settings. Worldwide, complication rates for adolescent and adult circumcision vary significantly depending on the practitioner performing the procedure: 1.8%–8.2% when performed by a trained clinician vs 18%–92% when performed by an untrained or traditional practitioner.<sup>47</sup> **A thorough physical examination should be performed prior to beginning any circumcision procedure to determine the most appropriate method of circumcision and to identify any anomalies that may make circumcision difficult or risky.**

Complications from circumcision include both those sustained during the procedure and those that develop later (table 3). Overall complication rates for circumcision for children under 12 years old have been reported to range from 0%–16%,<sup>47</sup> but severe adverse events are quite rare. In the U.S., the overall complication rate is generally highest for those patients aged 1–9 years when compared to those aged <1 year and 10 years and older.<sup>48</sup>

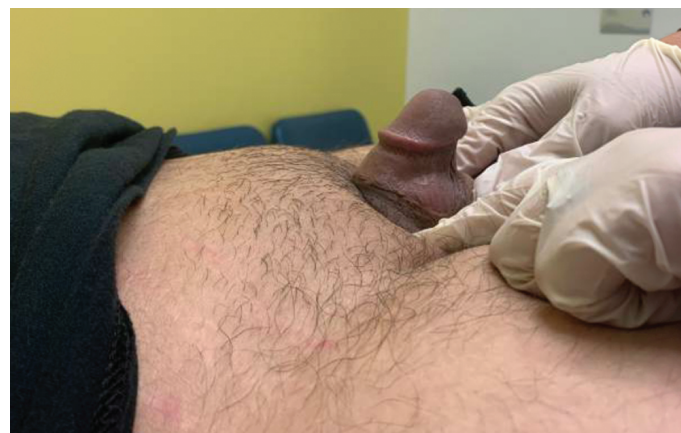
**Bleeding.** Bleeding is the most common intra and postoperative complication, with an incidence of approximately 0.1%–4%;<sup>49</sup> the incised skin edges, penetrating vessels or frenulum

may be the culprit. Bleeding is treated easily when recognized early and can almost always be controlled with application of pressure; however, it may require suture ligation or electrocautery, especially in older patients.

**Glans Amputation or urethral injury.** Glans amputation or injury can be a catastrophic complication, but is fortunately a quite rare one. Early recognition of the injury and immediate re-anastomosis of the glans itself is recommended. If the distal urethra is involved, primary re-anastomosis with Foley catheter placement may be attempted; however, these patients may develop distal hypospadias or a urethrocutaneous fistula requiring additional reconstruction in the future.<sup>50</sup>

**Penile skin loss.** Another unfortunate but exceedingly rare complication is penile skin loss, in which penile shaft skin is removed in addition to the foreskin, leaving the penis without skin coverage (fig. 3). Few case reports of skin loss due to circumcision are available in the literature. Depending on the extent of the skin loss, skin-grafting may be required for reconstruction.<sup>51</sup>

**Wound dehiscence.** The circumferential wound between the preputial collar and shaft skin may be susceptible to separation,



**Figure 3.** Total penile skin loss in 17-year-old patient circumcised at 2 years old. Distal penile shaft is covered in preputial skin. Mid- and proximal penile shaft is buried and tethered, causing painful erections (*Johnson*).

especially in older children or adults who undergo clamp circumcision vs conventional circumcision.<sup>31</sup> Wound edge separation can be addressed with conservative management and wound care, with consideration of the addition of antibiotics if concern for infection arises.

**Adhesions & penile skin bridges.** Post-circumcision glandular adhesions, which should be differentiated from physiological adhesions in uncircumcised young children, are a common occurrence. The border of adhesions can be traced along the curvature of the glans, and can be safely disrupted with gentle pressure on the penile shaft skin. **In contrast, penile skin bridges are scar tissue that forms from the circumcision seam to the glans. In the case of penile skin bridges, they should be excised, either under local or general anesthesia, to prevent build-up of debris, smegma and tethering of the glans.**

**Trapped penis.** Trapped penis occurs when the circumcision scar heals in such a way that the entire penis and glans is concealed below a tight ring of scar. About two-thirds of these patients will respond to topical steroids when applied to the tightest part of the cicatrix. Those who do not respond may need to undergo re-circumcision or penoplasty.<sup>37,32</sup>

**Meatal stenosis.** Meatal stenosis is one of the most frequently reported complications of circumcision, up to 6% in some studies.<sup>32</sup> Once the foreskin is removed, the meatus is left exposed, allowing it to come into contact with undergarments and clothing possibly resulting in a fibrotic process and narrowing the lumen of the meatus. Patients may notice a change in direction of the urinary stream or obstructive urinary symptoms. Treatment for meatal stenosis is a meatoplasty, which can be done under local or general anesthesia and involves widening the meatus by excising any meatal webbing that blocks the flow of urine.

## LEGAL & ETHICAL CONCERNS

**Concerns regarding the ethical permissibility of circumcision for children under the age of assent or consent have been expressed.**<sup>53</sup> Some have compared circumcision to female genital mutilation, also referred to as female genital cutting.<sup>54</sup> **Ethical concerns raised include the right of the child to bodily autonomy and concerns that prior assessments of the medical benefits of circumcision do not take into account future impact on sexual function or differential prevalence rates of HIV.** Therefore, the 2012 AAP Task Force statement has been critiqued on these grounds, and many have argued that elective circumcision should only be performed if the individual decides on it, and that circumcision of minor children should be reserved for foreskin issues that are refractory to other interventions.

Over the last several years, there has been increasing pressure from intersex and disorders/differences of sex development advocacy groups on pediatric urologists to stop performing “cosmetic” genital surgery on patients with differences of sex development. One strategy for limiting genital surgery on patients with differences of sex development has been through legal activism. Though binding legislation on this topic in the

United States does not exist, a nonbinding resolution did pass in California several years ago. A major argument put forth by the advocacy groups is that such procedures constitute a human rights violation. Expanding this logic flow, one could imagine that anti-circumcision advocacy groups could pursue similar legislative action to achieve a ban on routine circumcision of minors.

While some advocates strongly argue that routine or ritualistic circumcision of infants and young children is not ethically permissible, this viewpoint is largely not reflected in the circumcision trends observed in the U.S. Other ethicists have asserted that routine circumcision is ethically permissible, though the nuances of permissibility certainly do depend on local culture.<sup>55</sup> As detailed in the “Indications for non-neonatal circumcision section,” parents who have decided on a circumcision for their infant boy will frequently pursue a circumcision in the operating room if they are unable to obtain the procedure as a neonatal circumcision under local anesthesia. Urologists who perform circumcisions on patients should be aware of these ethical considerations, and for older children, take the patient’s perspective about circumcision into account whenever possible.

## ACKNOWLEDGEMENT

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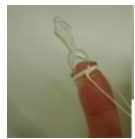






### DID YOU KNOW?

- Non-newborn circumcisions are performed in the U.S. for many indications, including delay of desired neonatal circumcision and symptomatic phimosis in older patients.
- Decisions about circumcision are frequently culturally driven, but lifelong health benefits do exist. Circumcision decreases the rates of urinary tract infection, HIV, human papilloma virus and penile cancer.
- Most non-newborn circumcisions are performed in the operating room via sleeve technique under general anesthesia in the U.S. Clamp devices and local anesthesia are more frequently used in international settings.
- Serious circumcision complications are rare. The most common immediate complication is bleeding, and complication rates and types vary by patient age and circumcision technique, including clamp type and wound closure.
- Ethicists and advocates express concern that routine circumcision of minors is not ethically permissible, but this viewpoint is not largely represented in U.S. circumcision trends or practices.

**Table 1.** Medical and anatomical contraindications to newborn clamp circumcision

| Medical  | Anatomical   |
|--|--|
| <ul style="list-style-type: none"> <li>• Concern for bleeding disorder</li> <li>• Vitamin K not given</li> <li>• Cardiac or pulmonary disease</li> <li>• Low birthweight</li> <li>• Prematurity</li> </ul> | <ul style="list-style-type: none"> <li>• Hypospadias</li> <li>• Chordee (penile curvature)</li> <li>• Buried penis</li> <li>• Penoscrotal web</li> <li>• Micropenis</li> </ul> |

**Table 2.** Circumcision clamp types

| Device Name       | clamp type                               | Retained Post-Procedure? | Age Group              | Photo   |
|-------------------|--|--------------------------|------------------------|---|
| Gomco*            | Metal bell clamp (multiuse)              | No                       | All ages               |    |
| Plastibell*       | Plastic clamp with ligature (single use) | Yes                      | Newborns and infants   |    |
| Mogen*            | Metal clamp (multiuse)                   | No                       | Newborns and infants   |    |
| ShangRing†        | Plastic clamp (single use)               | Yes (whole device)       | Adolescents and adults |  |
| PrePex‡           | Elastic and plastic ring (single use)    | Yes (whole device)       | Adolescents and adults |  |
| Alisklamp§        | Plastic bell clamp (single use)          | Yes (whole device)       | Infants to adults      |  |
| Unicirc           | Plastic bell clamp (single use)          | No                       | Adults                 |  |
| Circular Stapler¶ | Automatic clamp/stapler                  | Yes (staples only)       | Adults                 |  |

\*Johnson, E. "Circumcision clamps." 2020. JPEG files.

†Shang, Jian Zhong. "ShangRing Circumcision Device." Engineering For Change, [www.engineeringforchange.org/solutions/product/shangring-circumcision-device/](http://www.engineeringforchange.org/solutions/product/shangring-circumcision-device/). Accessed 29 Jan 2021.

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§ALISKLAMP. "Alisklamp Circumcision." Dralisklamp.com. <http://dralisklamp.blogspot.com/2012/08/alisklamp-alisklamp-is-new-generation.html>. Accessed 29 Jan 2021.

||Unicirc Circumcision. "Safe Male Circumcision with Unicirc Device." Youtube.com. [https://www.youtube.com/watch?v=RqX\\_2GNzxqg&feature=youtu.be](https://www.youtube.com/watch?v=RqX_2GNzxqg&feature=youtu.be). Accessed 29 Jan 2021.

¶Surkon Medical. "Circular stapler SHFA." MedicalExpo.com. <https://www.medicalexpo.com/prod/surkon-medical/product-97933-706127.html>. Accessed 29 Jan 2021.



**Table 3.** Complications of circumcision

|                                       |  |
|---------------------------------------|--|
| Early (intraoperative) complications  | Minor: <ul style="list-style-type: none"> <li>• Pain</li> <li>• Bleeding</li> <li>• Swelling</li> <li>• Inadequate skin removal</li> </ul>   |
|                                       | Major: <ul style="list-style-type: none"> <li>• Severe bleeding</li> <li>• Death due to blood loss</li> <li>• Glans amputation</li> <li>• Urethral injury</li> <li>• Scrotal injury</li> <li>• Penile skin loss</li> </ul>   |
| Delayed (postoperative) complications | Minor: <ul style="list-style-type: none"> <li>• Chronic pain</li> <li>• Wound infection</li> <li>• Wound dehiscence</li> <li>• Penile skin bridge</li> <li>• Penile inclusion cyst</li> <li>• Adhesions</li> <li>• Urinary retention</li> <li>• Meatal ulcer</li> <li>• Glans edema</li> </ul> |
|                                       | Major: <ul style="list-style-type: none"> <li>• Sepsis</li> <li>• Sexual dysfunction</li> <li>• Meatal stenosis</li> <li>• Fistula</li> <li>• Loss of sensation</li> <li>• Trapped penis</li> <li>• Decisional regret</li> </ul>   |

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# Study Questions Volume 40 Lesson 40

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1. The parents of an infant boy come to urology clinic to discuss the risks and benefits of a circumcision. Health benefits of circumcision include
  - a. improved penile length
  - b. increased penile sensation and sexual satisfaction
  - c. increase in rates of vesicoureteral reflux resolution
  - d. decreased risk of human immunodeficiency virus transmission
2. A newborn boy weighing 8 pounds with normal penile anatomy is discharged to home without a newborn circumcision being performed due to lack of an available circumcision practitioner. The baby is now 1 week old and healthy, and parents are still desirous of a circumcision for cultural and health purposes. The next step is referral to
  - a. outpatient newborn circumcision clinic within 1 month
  - b. pediatric urology clinic at 6–12 months of age
  - c. pediatric urology clinic at 2–3 years of age
  - d. pediatric urology clinic at 5–6 years of age
3. Parents of a 3-year-old boy who was circumcised as an infant have noticed 2 small, discrete bands of tissue that appear to cross from his circumcision scar to his glans. They have noticed that debris collects under these bands. They are unable to gently push these bands away from the glans. The best treatment for this circumcision complication is
  - a. observation
  - b. steroid ointment
  - c. antifungal ointment
  - d. excision under local or general anesthesia
4. While performing a local circumcision using a Mogen clamp on a 4-week-old boy, significant bleeding is noted, and the boy is found to have complete amputation of the glans and distal urethra. The practitioner should apply manual pressure and
  - a. manage conservatively with local wound care
  - b. use suture to close the defect
  - c. re-attempt circumcision
  - d. arrange for urgent glans re-anastomosis and urethral realignment with Foley catheter placement
5. Ethicists assert that circumcision of boys younger than the age of consent or assent is concerning because
  - a. bodily autonomy is not respected
  - b. circumcision has no medical benefits
  - c. anesthesia is required for the circumcision to occur
  - d. circumcisions are not always performed by physicians