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Report of the Task Force on Circumcision

The 1971 edition of *Standards and Recommendations of Hospital Care of Newborn Infants* by the Committee on the Fetus and Newborn of the American Academy of Pediatrics (AAP) stated that "there are no valid medical indications for circumcision in the neonatal period."^{1(p110)} In 1975, an Ad Hoc Task Force of the same committee reviewed this statement and concluded that "there is no absolute medical indication for routine circumcision of the newborn."^{2(p87)} The 1975 recommendation was reiterated in 1983 by both the AAP and the American College of Obstetrics and Gynecology in the jointly published *Guidelines to Perinatal Care*.³

Large-scale studies of US hospitals indicate that most male infants born in this country are circumcised in the newborn period,⁴ although the circumcision rate recently appears to be decreasing.⁵ Since the 1975 report, new evidence has suggested possible medical benefits from newborn circumcision. Preliminary data suggest the incidence of urinary tract infection in male infants may be reduced when this procedure is performed during the newborn period. There is also additional published information concerning the relationship of circumcision to sexually transmitted diseases and, in turn, the relationship of viral sexually transmitted diseases to cancer of the penis and cervix.

DEFINITIONS, PENILE HYGIENE, AND LOCAL INFECTIONS

The penis consists of a cylindrical shaft with a rounded tip (the glans). The shaft and glans are separated by a groove called the coronal sulcus. The foreskin, or prepuce, is the fold of skin covering the glans. At birth, the prepuce is still developing histologically, and its separation from the glans is usually incomplete. Only about 4% of boys have a retractable foreskin at birth, 15% at 6 months, and

50% at 1 year; by 3 years, the foreskin can be retracted in 80% to 90% of uncircumcised boys.⁶

Phimosis is stenosis of the preputial ring with resultant inability to retract a fully differentiated foreskin. Paraphimosis is retention of the preputial ring proximal to the coronal sulcus, creating a tension greater than lymphatic pressure resulting in subsequent edema of the prepuce and glans distal to the ring. Balanitis is inflammation of the glans, and posthitis is inflammation of the prepuce; these conditions usually occur together (balanoposthitis). Meatitis is inflammation of the external urethral meatus.

Newborn circumcision consists of removal of the foreskin to near the coronal sulcus performed in early infancy (before age 2 months). The procedure prevents phimosis, paraphimosis, and balanoposthitis. Meatitis is more common in circumcised boys. There is no evidence that meatitis leads to stenosis of the urethral meatus.

It is particularly important that uncircumcised boys be taught careful penile cleansing. As the boy grows, cleansing of the distal portion of the penis is facilitated by gently, never forcibly, retracting the foreskin only to the point where resistance is met. Full retraction may not be achieved until age 3 years or older.

A small percentage of boys who are not circumcised as newborns will later require the procedure for treatment of phimosis, paraphimosis, or balanoposthitis. When performed after the newborn period, circumcision may be a more complicated procedure.⁷

CANCER OF THE PENIS

The overall annual incidence of cancer of the penis in US men has been estimated to be 0.7 to 0.9 per 100 000 men and the mortality rate is as high as 25%.⁸⁻¹¹ This condition occurs almost exclusively in uncircumcised men.¹²⁻¹⁴ In five major reported series since 1932, not one man had been circumcised neonatally.^{11,15-19} The predicted lifetime risk of cancer of the penis developing in an uncircumcised man has been estimated at 1 in 600 men in the United States²⁰; in Denmark, the estimate is 1 in 909 men.²¹ In developed countries where

The recommendations in this statement do not indicate an exclusive course of treatment or procedure to be followed. Variations, taking into account individual circumstances, may be appropriate.

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neonatal circumcision is not routinely performed, the incidence of penile cancer is reported to range from 0.3 to 1.1 per 100 000 men per year.⁴ This low incidence is about half that found in uncircumcised US men, but greater than that in circumcised US men.

Factors other than circumcision are important in the etiology of penile cancer. The incidence of penile cancer is related to hygiene. In developing nations with low standards of hygiene, the incidence of cancer of the penis in uncircumcised men is 3 to 6 per 100 000 men per year.²² The decision not to circumcise a male infant must be accompanied by a lifetime commitment to genital hygiene to minimize the risk of penile cancer developing. Recently, human papillomavirus types 16 and 18 DNA sequences have been found in 31 of 53 cases of penile cancer, suggesting the importance of these viruses in the development of this condition.²³ Poor hygiene, lack of circumcision, and certain sexually transmitted diseases all correlate with the incidence of penile carcinoma.

URINARY TRACT INFECTIONS

A 1982 series of infants with urinary tract infections noted that males preponderated, contrary to female preponderance later in life, and that 95% of the infected boys were uncircumcised.²⁴ Beginning in 1985, studies conducted at US Army hospitals involving more than 200 000 men showed a greater than tenfold increase in urinary tract infections in uncircumcised compared with circumcised male infants; moreover, as the rate of circumcision declined throughout the years, the incidence of urinary tract infection increased.^{5,25} In another army hospital study, infants were examined in the first month of life and it was concluded that the high incidence of urinary tract infection in uncircumcised boys was accompanied by a similarly increased incidence of other significant infection, including bacteremia and meningitis²⁶; however, the authors of that study did not distinguish between bacteriuria secondary to septicemia and primary urinary tract infection. Still another recent army hospital study lends support to a 1986 hypothesis that circumcision prevents preputial bacterial colonization and thus protects male infants against urinary tract infection.^{27,28} It should be noted that these studies in army hospitals are retrospective in design and may have methodologic flaws. For example, they do not include all boys born in any single cohort or those treated as outpatients, so the study population may have been influenced by selection bias.

SEXUALLY TRANSMITTED DISEASES

Evidence regarding the relationship of circumcision to sexually transmitted diseases is conflicting.

Early series indicated a higher risk of gonococcal and nonspecific urethritis in uncircumcised men,^{29,30} whereas one recent study shows no difference in the incidence of gonorrhea and a higher incidence of nonspecific urethritis in circumcised men.³¹ Although published reports suggest that chancroid, syphilis, human papillomavirus, and herpes simplex virus type 2 infection are more frequent in uncircumcised men, methodologic problems render these reports inconclusive.^{29,30,32-34}

CERVICAL CARCINOMA

There appears to be a strong correlation between squamous cell carcinoma of the cervix and sexually transmitted diseases. Human papillomavirus types 16 and 18 are the viruses most commonly associated with cancer of the cervix³⁵⁻³⁸; Herpes simplex virus type 2 has also been linked with cervical cancer.^{36,39} Although human papillomavirus types 16 and 18 are also associated with cancer of the penis,^{23,37} evidence linking uncircumcised men to cervical carcinoma is inconclusive. The strongest predisposing factors in cervical cancer are a history of intercourse at an early age and multiple sexual partners. The disease is virtually unknown in nuns and virgins.

PAIN AND BEHAVIORAL CHANGES

Infants undergoing circumcision without anesthesia demonstrate physiologic responses suggesting that they are experiencing pain.⁴⁰ The observed responses include behavioral, cardiovascular, and hormonal changes. Pain pathways as well as the cortical and subcortical centers necessary for pain perception are well developed by the third trimester. Responses to painful stimuli have been documented in neonates of all viable gestational ages. Behavioral changes include a cry pattern indicating distress during the circumcision procedure and changes in activity (irritability, varying sleep patterns) and in infant-maternal interaction for the first few hours after circumcision.⁴¹⁻⁴³ These behavioral changes are transient and disappear within 24 hours after surgery.⁴³

SURGICAL TECHNIQUES AND LOCAL ANESTHESIA

Circumcision is a safe surgical procedure if performed carefully by a trained, experienced operator using strict aseptic technique. The procedure should be performed only on a healthy, stable infant. Clamp techniques (eg, Gomco or Mogen clamps) or a Plastibell give equally good results.⁴⁴ Techniques that may reduce postoperative complications include (1) using a surgical marking pen to mark the location of the coronal sulcus on the shaft

skin preoperatively; (2) identifying the urethral meatus; (3) bluntly freeing the foreskin from the glans with a flexible probe; (4) completely retracting the foreskin; and (5) identifying the coronal sulcus, all before applying the clamp or Plastibell and before excising any foreskin.⁴⁵ Electrocautery should not be used in conjunction with metal clamps. At the initial health supervision visit following hospital discharge, the penis should be carefully examined and the parents given instructions concerning on-going care.

Dorsal penile nerve block using no more than 1% lidocaine (without epinephrine) in appropriate doses (3 to 4 mg/kg) may reduce the pain and stress of newborn circumcision.^{41,46-49} However, reported experience with local anesthesia in newborn circumcision is limited, and the procedure is not without risk (see "Complications").

CONTRAINDICATIONS, COMPLICATIONS, INFORMED CONSENT

Circumcision is contraindicated in an unstable or sick infant. Infants with genital anomalies, including hypospadias, should not be circumcised because the foreskin may later be needed for surgical correction of the anomalies. Appropriate laboratory studies should be performed when there is a family history of bleeding disorders. Infants who have demonstrated an uncomplicated transition to extrauterine life are considered stable. Signs of stability include normal feeding and elimination and maintenance of normal body temperature without an incubator or radiant warmer. A period of observation may allow for recognition of abnormalities or illnesses (eg, hyperbilirubinemia, infection, or manifest bleeding disorder) that should be addressed before elective surgery. It is prudent to wait until a premature infant meets criteria for discharge before performing circumcision.

The exact incidence of postoperative complications is unknown,⁵⁰ but large series indicate that the rate is low, approximately 0.2% to 0.6%.^{44,45,51,52} The most common complications are local infection and bleeding. Deaths attributable to newborn circumcision are rare; there were no deaths in 500 000 circumcisions in New York City⁵² or in 175 000 circumcisions in US Army hospitals.⁵¹ A communication published in 1979 reported one death in the United States due to circumcision in 1973, and the authors' review of the literature during the previous 25 years documented two previous deaths due to this procedure.⁵³

Complications due to local anesthesia are rare and consist mainly of hematomas and local skin necrosis.^{41,46-49,54} However, even a small dose of lidocaine can result in blood levels high enough to produce measurable systemic responses in neo-

nates.^{55,56} Local anesthesia adds an element of risk and data regarding its use have not been reported in large numbers of cases. Circumferential anesthesia may be hazardous. It would be prudent to obtain more data from large controlled series before advocating local anesthesia as an integral part of newborn circumcision.

When considering circumcision of their infant son, parents should be fully informed of the possible benefits and potential risks of newborn circumcision, both with and without local anesthesia. In addition to the medical aspects, other factors will affect the parents' decisions, including esthetics, religion, cultural attitudes, social pressures, and tradition.

SUMMARY

Properly performed newborn circumcision prevents phimosis, paraphimosis, and balanoposthitis and has been shown to decrease the incidence of cancer of the penis among US men. It may result in a decreased incidence of urinary tract infection. However, in the absence of well-designed prospective studies, conclusions regarding the relationship of urinary tract infection to circumcision are tentative. An increased incidence of cancer of the cervix has been found in sexual partners of uncircumcised men infected with human papillomavirus. Evidence concerning the association of sexually transmitted diseases and circumcision is conflicting.

Newborn circumcision is a rapid and generally safe procedure when performed by an experienced operator. It is an elective procedure to be performed only if an infant is stable and healthy. Infants respond to the procedure with transient behavioral and physiologic changes.

Local anesthesia (dorsal penile nerve block) may reduce the observed physiologic response to newborn circumcision. It also has its own inherent risks. However, reports of extensive experience or follow-up with the technique in newborns are lacking.

Newborn circumcision has potential medical benefits and advantages as well as disadvantages and risks. When circumcision is being considered, the benefits and risks should be explained to the parents and informed consent obtained.

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