Circumcision, Past and Present

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Introduction

The history of male circumcision dates back to ancient times and may be the oldest known surgical procedure; however, circumcision has only been a point of interest to the medical community for the past 150 years. From the beginning of its association with medicine, controversy has surrounded the procedure. Much has been published on both the benefits and the risks of circumcision. Although the issue continues to divide the medical community, several medical organizations across the world have begun to question the routine nature of this procedure. The purpose of this essay is to provide background on the non-ritual practice of neo-natal circumcision and to encourage the medical community to reexamine the routine nature of circumcision.

History

Throughout history several different communities have practiced circumcision, most notably Jews and Muslims. Although scholars believe that the Jewish and Muslim practices of circumcision have non-religious origins, circumcision is very important for the Jewish and Islamic faiths. Jews trace their heritage to the patriarch Abraham, with whom God made a covenant. God promised Abraham many, many descendents (the Jewish nation), but as a sign of this covenant God

required that Abraham be circumcised and that all his descendents be circumcised on the eighth day after birth (Genesis 17:10). To this day circumcision remains a powerful symbol of the Jewish faith. In fact the circumcision ritual is a celebration in the Jewish community.

Circumcision is also an important ritual in the Islamic tradition, although there is no mention of circumcision in the Holy Koran. It is likely that circumcision was a well-established practice in Muslim communities before the advent of Islam. Although only one of the six major sects of Islam deems circumcision as mandatory, the prevalence of circumcision among Muslims remains very high [1].

Until the nineteenth century neo-natal circumcisions were typically performed either by family members or community or religious leaders. In fact the medical practice of both adult and neo-natal circumcision did not arise until the latter half of the nineteenth century. At this time several physicians and surgeons began to perform circumcisions not only as a treatment for conditions such as phimosis but also for prophylactic reasons. Many doctors believed that circumcision could prevent various conditions such as impotence, sterility, and even epilepsy. Others recommended it as a means of preventing masturbation [2].

The trend of newborn circumcision grew over the decades of the late 1800's and the early 1900's, although the medical reasons for performing the circumcision were not always substantiated by scientific proof. During the second half of the twentieth century, the number of circumcised infants rose dramatically.

Physicians began to site more plausible reasons for performing routine circumcision such as prevention of infection, STD's, and cancer.

Prevalence

In the US it is estimated that the prevalence of circumcision increased from roughly 30% in the 1930's to nearly 80% in the early 1970's [3]. According to the National Center for Health Statistics (NCHS, a US Federal Government body), the incidence of circumcision in the US appears to have fallen during the 1990's to between 60% and 64%. However, this data is based on voluntary collection of data from participating hospitals; less than 5% of US hospitals participated in this collection [4]. Thus, the NCHS figures do not provide an adequate measurement of circumcision frequency across the US. A study based on hospital records in Atlanta, GA, site circumcision rates of 84% to 89% between 1985 and 1986 [5]. A study in New York estimates that 45.5% of males born in New York City and 69.6% born elsewhere in the state were circumcised in 1985 [6]. None of these statistics include ritual circumcision performed outside the hospital; thus, these studies likely underestimate the true rate of circumcision. In Canada approximately 48% of males are circumcised [4].

In Asia, South America, Central America, and most of Europe, circumcision is much less common [4], although in South Korea the circumcision rate is estimated at about 80% [7]. This is due to the influence of the US military in South Korea during the second half of the twentieth century [7].

The Prepuce

Perhaps the strongest debate related to circumcision focuses on the biological function and importance of the prepuce itself. The prepuce, or foreskin, covers the glans penis (see Figure 1). Early in embryonic development, the squamous epithelial layers of the glans and the prepuce are inseparable. At birth there is usually only partial separation between the two layers; however, the foreskin is completely retractable in roughly 90% of uncircumcised males by the age of five [4].

Proponents of circumcision often justify the procedure by claiming that the foreskin is unnecessary tissue whose removal may prevent certain medical conditions. In fact, some physicians believe that the prepuce is a leftover embryological structure. Although not much research exists on the function of the prepuce, published studies have shown that the foreskin is an androgen-dependent structure [8] that metabolizes prostaglandins [2]. From a gross anatomical perspective, the prepuce is obviously a protective layer of skin over the glans penis, "similar to the eyelids, labia minora, anus, and lips" [9]. The nerve supply of the foreskin also demonstrates that it is an erogenous tissue [10]. Given this evidence, Dunsmuir and Gordon exclaim, "a vestigial structure it almost certainly is not" [2].

Current Methods of Circumcision

Nearly all medically performed circumcisions follow the same method. First, a newborn is placed on its back and its legs are separated and secured to supports. If the prepuce is not completely separated from the glans, the physician bluntly separates the two layers manually. One of three types of devices-the Gomco clamp, the Plastibell device, or the Mogen clamp- is placed over the glans; often it is necessary to make a slit in the dorsal portion of the foreskin to place the device. The prepuce is then removed by incision.

Jewish ritual circumcision does not differ much from medical methods except that no devices are used to protect the glans.

The Case for Circumcision

There appears to be three principal health benefits of circumcision, although all three continue to be debated in the literature. First, circumcision may reduce the occurrence of urinary tract infection (UTI) in newborns. Many studies in recent years have examined the relationship between circumcision status and UTI [11-17]. A study in Canada of 58,000 infants found a nearly four-fold increase risk of UTI in uncircumcised males in relation to circumcised males [18]. Although the evidence appears to confirm an increased risk of UTI in uncircumcised individuals, many physicians question the relative magnitude of this risk [19, 4]. The incidence of UTI in uncircumcised males is between 0.4% and 1% [20].

Furthermore, the American Academy of Pediatrics (AAP) questions the methodology of these studies linking UTI to circumcision status. In its 1999 Circumcision Policy Statement the AAP points out that few of these studies take into account confounding factors such as prematurity. Premature infants are not circumcised because of their fragile health. Premature infants also appear to have increased risk of developing UTI. Inclusion of premature infants in the population studies would suggest an increased rate of UTI in uncircumcised males.

Second, evidence points to an increased risk of penile cancer in uncircumcised males. A study of penile cancer revealed that the rate of cancer in uncircumcised men was 2.2 per 100,000, more than twice that of the general population (0.9 to 1.0 per 100,000) [21]. Penile cancer is a rare disease, even in the uncircumcised population. The American Medical Association asserts that, "because this disease is rare and occurs later in life, the use of circumcision as a preventative practice in not justified" [19].

Third, several studies found a correlation between circumcision status and susceptibility to HIV. A literature review in 1994 found that 18 of 26 studies discovered a statistically significant correlation between increased risk of HIV infection and lack of circumcision [29]. Other studies have suggested increased risk of other STD's in the uncircumcised population. However, behavioral factors such as use of condoms, number of sexual partners, etc. are more important determinants of risk for contracting STD's including HIV. According to the AMA,

"circumcision cannot be responsibly viewed as 'protecting' against such infections" [19].

The Case against Circumcision

In general, circumcision is a very safe surgery; however, complications can occur. The most common complication of circumcision is bleeding, which occurs in about 0.1% of cases [22].

The argument against circumcision is mainly an ethical (and by consequence a legal) argument. The principle of an individual's self-determination is essential to the practice of medicine throughout the world. Physicians may not perform any procedures or provide any treatment without the patient's informed consent. In the case of a child who is not able to make health care choices for him or herself, we allow the child's parents or guardians to make decisions about the child's medical problems. However, surrogate decision-making is not a right of the parents, but rather a privilege accorded to them by society so that they may act in the best interests of the child [34].

As a human being the infant has rights; he or she is not simply an extension of his or her parents [34]. Therefore, parents may only make health care decisions for their children under certain conditions. The Committee on Bioethics of the American Academy of Pediatrics (AAP) has developed policy on informed consent for children. According to the AAP, physicians may only substitute

informed parental permission for consent from the child to perform medical interventions that are of a clear and immediate medical necessity. For non-essential treatments that may be deferred to a later date without significant risk to the child, physicians and parents should wait until the child is able to make his or her own decisions. Non-ritual circumcision does not appear to meet the criterion of clear and immediate medical necessity. Of the three diseases associated with lack of circumcision, only urinary tract infection poses a threat to a young child. However, as noted above, the risk of UTI is low, even among uncircumcised males. Therefore, since circumcision seems to be a non-essential treatment, parents should consider waiting until the child is able to make a choice about circumcision himself.

Anaesthesia

Another major issue concerning the practice of circumcision is the use of anaesthesia or analgesia to prevent pain during the procedure. Anaesthesia is not a component of ritual circumcision. Ritual circumcision is normally performed by non-medical individuals who cannot administer anaesthetics. Surprisingly, less than half of the physicians who regularly perform circumcision in the US use anaesthesia. A recent survey of physicians (pediatricians, obstetricians, and general practitioners) across the US found that only 45% of those who perform circumcision use anaesthesia or analgesia [23]. These physicians offered five main reasons for not using anaesthesia or analgesia (see table 1 reproduced from Stang and Snellman).

Table 1. Reasons cited by physicians who do not use anaesthetics or analgesics. *

Concern about adverse drug side effects	54%
Procedure does not warrant it	44%
Infants do not remember pain	23%
Not familiar with technique	18%
Adds too much time	9%

*More than one response may have been recorded by an individual respondent.

Another study found that 7% of the physicians surveyed believe that infants cannot feel pain and as many as 35% believe that infants cannot remember pain [24]. This attitude toward pain in newborns is often the justification for not using anaesthesia during circumcision. Recent studies appear to contradict these common assumptions. Stang and Snellman site several studies that document the newborn's ability to experience and perceive pain [23]. During circumcision infants demonstrate classic physiological signs of pain such as increased heart rate and blood pressure [30, 31] and increased serum cortisol levels [32, 33]. New data also refutes the argument that neonates cannot remember pain. Pain experienced during circumcision seems to affect an individual's response to subsequent experiences of pain such as childhood vaccination [25, 26].

Fortunately, the medical community has made efforts recently to change misconceptions concerning the effect of anaesthesia on newborns and to provide further training to physicians in the use of anaesthesia and analgesia during circumcision. The Ambulatory Pediatric Association has issued guidelines for residency training that includes proper circumcision technique, including use of anaesthesia. Many other organizations recommend the use of anaesthesia for

circumcision including the American Medical Association [19], the American Academy of Pediatrics [4], the Canadian Medical Association [27], and the Australian College of Paediatrics [28].

Conclusion

Non-ritual circumcision appears to be declining slightly across the world, including in the United States, yet a large percentage of American and Canadian newborns continue to be circumcised each year. Although the debate over the benefits and risks of circumcision continues, many leading organizations in the medical community have recently expressed their concern for the routine nature of this procedure. In a recent review of their policy on circumcision the Canadian Medical Association stated: "The overall evidence of the benefits and harms of circumcision is so evenly balanced that it does not support recommending circumcision as a routine procedure for newborns" [27]. The American Academy of Pediatrics made a similar statement in 1999: "Existing scientific evidence demonstrates potential medical benefits of newborn male circumcision; however these data are not sufficient to recommend routine neonatal circumcision" [4]. Furthermore, these organizations urge physicians to offer to parents unbiased information concerning the risks and benefits of circumcision based on available scientific evidence. The Australian College of Pediatrics warns, "in all cases the medical attendant should avoid exaggeration of either benefits or risks of this procedure" [28].

The debate over circumcision will likely continue during the coming decades. However, given the prevalence of this procedure in the US and Canada, the medical establishment must make an effort to dispel misconceptions concerning circumcision and further educate physicians and the general public based on the scientific data currently available.

References

1. Rizvi SAH et al. Religious circumcision: A Muslim view. *BJU International* (1999). 83, Supp. 1. 13-16
2. Dunsmuir WD and Gordon EM. The history of circumcision. *BJU International* (1999). 83, Supp. 1. 1-12
3. Laumann EO, Masi CM, Zuckerman EW. Circumcision in the United States. Prevalence, prophylactic effects, and sexual practice. *JAMA*. 1997;277:1052-1057
4. American Academy of Pediatrics, Task Force on Circumcision. Circumcision Policy Statement. *Pediatrics*. 1999:103(3):686-693
5. O'Brien TR, Calla E, Poole WE. Incidence of neonatal circumcision in Atlanta, 1985-1986. *South Med J*. 1993;88:411-415
6. Wilkes. Blum S. Current trends in routine newborn circumcision in New York State. *NY Medical Journal*. 1990;90:243-246
7. Kim DS, Lee JY, Pang MG. Male circumcision: a South Korean perspective. *BJU International*. 1999;83, Supp. 1. 28-33
8. Roehrborn CG et al. Changes in amount and intracellular distribution of androgen receptors in human foreskin as a function of age. *J Clin Invest*. 1987;79:44-7
9. Cold CJ and Taylor JR. The Prepuce. *BJU International*. 1999;83, Supp. 1. 34-44
10. Winkelman RK. The erogenous zones: their nerve supply and significance. *Proc Mayo Clin*. 1959;34:39-47
11. Wiswell TE, Smith FR, and Bass JW. Decreased incidence of urinary tract infections in circumcised male infants. *Pediatrics*. 1985;75:901-903
12. Wiswell TE, Miller GM, Gelston HM, et al. Effect of circumcision status on periurethral bacterial flora during the first year of life. *J Pediatr* 1988;113:442-446
13. Wiswell TE, Roscelli JD. Corroborative evidence for the decreased incidence of urinary tract infections in circumcised male infants. *Pediatrics* 1986;78:96-99
14. Wiswell TE, Miller GM, Gelston HM, et al. Effect of circumcision on incidence of urinary tract infection in preschool boys. *JPediatr* 1996;125:23-27
15. Crain EF and Gershel JC. Urinary tract infections in febrile infants younger than 8 weeks of age. *Pediatrics.* 1990;86:363-367
16. Hertzog LW. Urinary tract infections and circumcision: a case control study. *Am J Dis Child,* 1989;143:345-350
17. Rushton HG, Majd M. Pyelonephritis in male infants; how important is the foreskin? J Urol 1993:733:733-736
18. To T, Agha M, Dick PT, Feldman W. Cohort study on circumcision of newborn boys and subsequent risk of urinary tract infection. *Lancet*. 1998;352:1813-1816
19. Council on Scientific Affairs, American Medical Association. Neonatal Circumcision. Chicago: AMA, 2000
20. Wiswell TE, Enzenauer RW, Cornish JD, Hankins CT. Declining frequency of circumcision: Implications for changes in the absolute incidence and male to

female sex ratio of urinary tract infections in early infancy. *Pediatrics*. 1987;79:338-341
21. Kochen M, McCurdy S. Circumcision and the risk of cancer of the penis. A life-table analysis. *Am J Dis Child*. 1980;134:484-486
22. Kaplan GW. Complications of circumcision. *Urol Clin North Am*. 1983;10:543-549
23. Stang HJ and Snellman LW. Circumcision practice patterns in the United States. *Pediatrics*. 1998;101(6):e5
24. Wellington N and Rieder MJ. Attitudes and practices regarding analgesia for newborn circumcision. *Pediatrics*. 1993;92:541-543
25. Taddio A, Goldbach M, Ipp M, et al. Effect of neonatal circumcision on pain responses during vaccination in boys. *Lancet*. 1995;345:291-292
26. Taddio A, Katz J, Ilersich AL, Koren G. Effect of neonatal circumcision on pain response during subsequent routine vaccination. *Lancet*. 1997;349:599-603
27. Canadian Medical Association. Neonatal circumcision revisited. *Canadian Medical Association Journal.* 1996;154(6):769-780
28. Australian College of Paediatrics. Position statement: Routine circumcision of normal male infants and boys. Parkville, Victoria: 1996
29. Moses S, Plummer FA, Bradley JE, et al. The association between lack of male circumcision and the risk of HIV infection: a review of the epidemiological data. *Sex Transm Dis*. 1994;21:201-210
30. Williamson PS, Wialliamson ML. Physiologic stress reduction by a local anaesthetic during newborn circumcision. *Pediatrics*. 1983;71:36-40
31. Holve RL et al. Regional anaesthetic during newborn circumcision: effect on infant pain response. *Clin Pediatr* (Phila). 1983;22:813-8
32. Talber LM, Kraybill EN, Potter HD. Adrenal cortical response to circumcision in the neonate. *Obstet Gynecol* 1976;48:208-10
33. Gunnar MR et al. The effects of circumcision on serum cortisol and behavior. *Psychoneuroendocrinology*. 1981;6:269-75
34. Legal
35. Committee on Bioethics. Informed consent, parental permission, and assent in pediatric practice. *Pediatrics*. 1995;95:314-7