Male circumcision: An overview

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ABSTRACT

Circumcision is one of the common operations performed worldwide, for various reasons. Controversy exists as to whether circumcision is an operation. This literature review discusses the indications of circumcision, benefits and complications of circumcision, and alternatives to circumcision.

Relevant articles on the benefits, complications, indications and alternative to circumcision from 1964 to 2005 were reviewed, from National Library of Medicine's Pubmed database. Additional articles were obtained from the reference lists of key articles and recent reviews.

Key words: Phimosis, circumcision, complications of circumcision, alternatives of circumcision.

INTRODUCTION

Circumcision is probably one of the oldest and most controversial surgical procedures[1]. It has been described in Egyptian papyri and wall carvings dating back to 4000 BC[2], the ancient mummies were found to be circumcised.[3] Circumcision almost certainly began and is still being practiced, as a religious rite by the Jews and the Muslims. In the former community a Mohel usually performs it without any anesthesia on the child's 8th day of life, but in the later, circumcision is usually performed between 4 and 13 years of age.[3]

Circumcision was likely to have started as an early public health measure for preventing recurrent balanitis caused by accumulation of sand under the foreskin, in the ancient societies of the Middle East.[4] This fact was confirmed by the Australian army medical corps during the two world wars. Soldiers stationed in the sandy regions of the Middle East and North Africa required circumcision for recurrent "epidemic" balanitis.[4]

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Over the years circumcision has become controversial especially in newborn males; many of the medical indications have been questioned. Currently about one-sixth of the world's male population undergoes ritual circumcision on religious grounds._Since neonatal circumcision is not necessary for the child's wellbeing,[5] various medical associations like the American Academy of Paediatrics (AAP), British Medical Associations and Canadian Paediatrics Society, Royal Australasian College of Physicians suggested that it should be performed only for established medical reasons and not to be universally recommended.[6]

Parents who believe that circumcision is of medical benefit should be educated on the pros and cons of the procedure, and available alternatives to circumcision. They need to know that their child may lead a healthy life even with an intact foreskin. Such information may enable them to make the right choice for their child and give an informed consent.

INCIDENCE

Circumcision is practised less frequently in western European countries compared to the USA.[7-11] In UK the incidence of circumcision has dropped from 30,000 to 12, 200 procedures annually in the last decade.[12] Similarly in Australia there has been a progressive fall in the rate of circumcision since the 1970s, the present incidence is less than 30%.[8] In contrast, in the USA the incidence of newborn circumcision alone increased significantly from 48.3% (between 1988 and 1991) to more than 61% (between 1997 and 2000).[13]Some of the reasons for this increase may include adherence to religious practise, "hygiene" [4], increased awareness of some of its potential benefits[13]; a considerable number of circumcisions are as a result of failure to distinguish a pathological phimosis from a healthy non-retractile foreskin.[14]

ROUTINE NEONATAL CIRCUMCISION

Routine neonatal circumcision has many proponents as well as opponents. Beneficial effects of circumcision include prevention of phimosis, paraphimosis, and balano-posthitis. The risk of urinary tract infection

in neonatal males has been shown to decrease from 7 per 1000 to 2 per 1000 after circumcision.[4] Some studies showed that circumcised males are less likely to suffer from human papilloma virus infection of penis and their female counterparts less likely to develop cervical cancer, in comparison to their uncircumcised counterparts.[15] The incidence of sexually transmitted diseases (STDs) is 10% lower in circumcised males.[4]

Some recent studies showed that circumcision may remove the HIV-1 target cell enriched inner layer of foreskin, the receptors for HIV virus, thereby providing protective effects against HIV infections.[16,17] Epidemiological and biological studies provide compelling evidence regarding the protective effects of male circumcision against male heterosexual HIV transmission, and also explain the significant geographical differences in the prevalence of HIV infection within sub-Saharan Africa.[18] Male circumcision may reduce the relative risk of HIV infection especially in high-risk areas, and this may partly explain the surprising low rates of HIV in Islamic nations like Egypt, Sudan, Iran, Iraq, Pakistan, Bangladesh, and Indonesia compared to their neighbours.[15]

An often-asked question is the effect of circumcision on sexual functions. A study revealed that adult circumcision increases the ejaculatory latency time without having any adverse affect on sexual functions.[19] This may be considered an advantage rather than complication.

Despite the above mentioned advantages, routine neonatal male circumcision has certain drawbacks. Standard medical ethics dictates that unnecessary radical surgery should be avoided and the attempts should always be made to maintain normal physiological functions of the body. Circumcision is a painful procedure (as it is frequently performed by untrained persons, without anesthesia) and traumatic both for the child and the mother. In October 2001, a new law in Sweden stipulates that only licensed doctors or persons certified by the National Board of Health can perform circumcision; and Mohels may perform it only in company of a physician or nurse for anesthesia.[20]

A widely prevailing myth is that Jewish circumcision is less painful than Muslim circumcision because newborn babies simply do not feel pain.[2] Medical researches proved on the contrary, demonstrating that physiological responses during circumcision is comparable to severe stress (rise in the heart rate, respiratory rate, plasma cortisol level and fall in transcutaneous oxygen tension).[21,22] Thus, these babies not only feel pain but also do it more intensely, for a prolonged period and over a wider area of the body than older children do.[2] J. Goodman, a Jewish doctor and mother herself, who had witnessed the ritual several times as a medical student comments that "anyone subjecting an adult to what is permitted in regard to an 8-day-old baby would be charged with assault…. if the babies are regarded as human beings, then it must be unethical for them to be held down forcibly while a healthy functional part of their body is excised…. their screams indicating that they are actually withholding their consent".[2] This traumatic experience often has a lasting impression on the child's psyche.[2]

It is argued that doubtful[16] or marginal[4] benefits against STDs do not justify circumcision of the entire male population. Benefits against HIV is certainly a factor to reckon with, but other cultural, social, and hygienic aspects along with increasing public awareness through health education needs more stress for prevention of this dreadful disease.

The belief that circumcised state is protective against squamous cell carcinoma of penis is no longer tenable if one compares the incidence of carcinoma penis in USA (0 to 2.1 per 100,000), where neonatal circumcision is very common with that of Denmark (1.1 per 100,000) and Japan (0.3 per 100,000) where circumcision is rarely performed.[3]

It seems that foreskin has important functions that are not yet recognized or understood including natural protection of the glans penis. The foreskin has specialized nerve endings for fine touch similar to those found in the fingertips and lips (Meissner corpuscles) which enhances sexual pleasure.[5] Penetration in circumcised man has been compared to thrusting the foot in a sock held open at the top while that in the intact counterpart has been likened to slipping the foot into a sock that has been previously rolled up.[23] According to Viens[6], ritual circumcision thus removes this healthy, functioning, erogenous tissue, which may be serving important protective, sensory and sexual purposes. Moreover, there are some definite complications associated with this procedure as detailed later.

CIRCUMCISION IN CHILDHOOD BASED ON MEDICAL INDICATIONS

Most paediatric urologists recommend circumcision for acquired phimosis, paraphimosis, recurrent balanitis and in boys with recurrent urinary tract infections.[5] However, phimosis itself is a controversial diagnosis.

In common usage it implies any condition where the foreskin cannot be retracted. But most infants are born with a foreskin that does not retract and it may not do so until after puberty- it is a normal physiology and not phimosis. Spontaneous full retractability occurs in 90% of the boys by 16 years and in 99% of males by 18 years of age.[24] The parents should be instructed against repeated forcefully retraction of the immature foreskin for "cleaning" of smegma as it would invite fibrosis and development of "true" phimosis or preputial stenosis. The production of smegma helps in natural separation of glans from the foreskin as the child matures.

Acquired phimosis is usually due to poor penile hygiene. Avoidance of external irritants (chemicals contained in bubble bath to name one) and regular cleaning of the accumulated dirt and urine under the foreskin later on in childhood will definitely prevent recurrent balanitis, and /or tearing of the delicate prepucial opening, thereby preventing acquired phimosis.[4] Sometimes generalized edema may result in non-retractile prepuce; hence general state of health should be assessed before a diagnosis of phimosis is made and circumcision is considered.

Rickwood *et al*.[14,25] defined phimosis as a tight non-retractile prepuce caused by balanitis xerotica obliterans (BXO), characterized by a whitish hardened sclerotic skin at the tip of the prepuce. Many doctors in UK are often not trained to distinguish between pathological phimosis and the developmental tightness of the prepuce, resulting in misdiagnosis;[26-29] the condition in USA is probably much worse. Rickwood *et al*.[14, 25, 30] noted that as a result of this over diagnosis, a number of circumcisions performed in UK is 8 times more than actually indicated.[14] Circumcision is only recommended for confirmed cases of phimosis caused by BXO.

A recent study from Scotland suggests that the steady decrease in the circumcision rates are due the awareness that healthy non-retractile foreskin in children does not require circumcision.[31]

The need of circumcision following reduction of paraphimosis is debatable. A good perineal hygiene may be equally effective (as circumcision) in reducing the incidence of urinary tract infection in baby boys. [4]

As the debate concerning the medical and ethical issues continues, the economic factors are beginning to limit the practice in some countries. In England and Canada, infant circumcision had been removed from the list of procedures available as public healthcare service; and in USA many private insurance companies have decided not to subsidize the cost of this procedure.[6]

According to Hutson[4], it may be a matter of time before adult males who were circumcised in childhood begin legal action against their parents or their doctors for the so-called mutilation of their bodies without medical indications or permission.

CONTRAINDICATIONS

Circumcision should not be performed in children with congenital penile anomalies such as hypospadias, epispadias, chordee, megalourethra, or webbed penis. It should be avoided in patients with bleeding disorders. During ritual infant circumcision, adhesions between glans and foreskin needs careful separation with a lacrimal probe to enable inspection of glans for anomalies like hypospadias, urethral duplication. One should abandon the procedure if such anomalies are detected.

COMPLICATIONS

Some of complications following circumcision may be catastrophic and cause lifelong disability. On occasion the gender of a male child had to be reassigned to female because of iatrogenic loss of the penis.[32] Other complications, their causes and ways of prevention are summarized in Table 1.

THE ALTERNATIVES TO RADICAL CIRCUMCISION

Radical circumcision is now an obsolete procedure. It is a painful procedure with prolonged and difficult recovery, results in destruction of much functional tissue and sometimes associated with serious complications. It is also the most expensive method of treating a tight foreskin.[39] The alternative conservative treatments available are listed below.

Topical steroid application (0.05% clobetasol propionate cream applied twice daily for 1 to 2 months) is highly efficacious in relieving preputial stenosis, with a success rate of 85 to 95%.[40-41] Steroids have the effect of accelerating the normal growth and expansion of the foreskin resulting in the relief of the nonretractile condition. It has become the treatment of choice in some societies due to its low morbidity, low cost, nontraumatic and painless nature. It has been recommended by the AAP in its 1999 Circumcision Policy Statement.[42]

Skin under stretch expands with the growth of more cells. Gentle stretching of the foreskin over a period of time by the parents will ultimately open up the

Table 1: Complications of childhood male circumcision

Complication	Cause	Precaution/action
Hemorrhage		Carefully stitch with a fine suture. Care and attention to detail
Retention of urine, may cause ruptured bladder.[33]	Pain or over zealously applied circumferential bandage to aid haemostasis.[34]	Local treatment and antibiotics
Sepsis (severe necrotizing fascitis, Fournier's syndrome, tetanus, neonatal meningitis, septicemia with β-hemolytic streptococcus, staphylococcal scalded skin syndrome.[3]		
Excision of too little or too much foreskin.		Care and attention to operative detail
Concealed penis[35]	Excision of too much foreskin;	Care and attention to operative detail
Amputation of the glans	Guillotine technique	
Bivalving of the glans	Inadvertent placement of scissors into the urethra while attempting dorsal slit. Over tight placibel	
Urethrocutaneous fistula	Placement of a haemostatic suture into the urethra in an attempt to secure the bleeding from frenulum, or a consequence of a similar attempt in patients with unrecognized megalourethra.	
Meatal stenosis	Meatal ulceration.	Care and attention to operative detail
Glanular ulceration	Rough separation of the preputial adhesions	Care and attention to operative detail
Psychological disturbances	Circumcision in the phallic stage.[3]	
Miscellaneous: Penile torsion,[5] skin bridge,[37] inclusion cysts,[38] retained Plastibell device.[5]		

narrow preputial opening while preserving the foreskin. Balloon dilatation [43] and a new device from Turumaki Corporation, Japan have all claimed success.

Preputioplasty and dorsal slit are conservative alternative to the radical circumcision. They have the advantages of being rapid and less painful. The recovery is faster and the functioning preputial tissue is preserved. Y and V plasties are also possible but they require skilled surgeons. The Cuckow[42] procedure of "dorsal slit with transverse closure" has been recommended by the AAP in its 1999 Circumcision Policy Statement.[44] The lateral technique described by Lane *et al.*[45] provides cosmetic improvement by shifting the "slit with transverse closure" from the dorsal aspect to the sides.

"Triple incision preputioplasty" has been claimed to be a simple, safe and rapid technique which gives a good functional and cosmetic outcome. Here three longitudinal incisions on the stenosing segment are made and then sutured diagonally.[46]

Other modalities like the Nd: YAG laser contact technique[47] and octylcyanoacrelate glue[48] are used to perform sutureless circumcision.

CONCLUSION

Circumcision has elicited more controversies than any surgical procedure in history. The debate is still raging on. The health benefits should be weighed against the potential risks the procedure offers. The practice of ritual circumcision or routine neonatal circumcision in some communities may not be in the best interest of the babies. However, whenever it is performed, it should always be done by trained doctors under proper local or general anesthesia, preferably after a full parental informed consent. Legislative actions seeking prohibitions of circumcision by non medical persons, needs to be seriously considered. The forums for protection of child's rights have a role to play in this regard.

There are modern techniques that provide safer, simpler, quicker, cheaper alternatives to the traditional means of circumcision with good functional and cosmetic results.

REFERENCES

1. Alanis MC, Lucidi RS. Neonatal circumcision: a review of the world's oldest and most controversial operation. Obstet Gynaecol Survey 2004;59:379-95.
2. Goodman J. Jewish circumcision: an alternative perspective. Br J Urol Int 1999;83 Suppl 1:22-7.
3. Williams N, Kapila L. complications of circumcision. Br J Surg 1993; 80:1231-6.
4. Hutson JM. Circumcision: a surgeon's perspective. J Med Ethics 2004;30:238-40.
5. Cantu S Jr. Circumcision. e Medicine Journal [serial online] Updated 2004. Available at http://www.emedicine.com.

6. Viens AM. Value judgment, harm, and religious liberty. J Med Ethics 2004;30:241-7.
7. Rickwood AMK. Circumcision of boys in England: current practice. Pediatr Surg Int 1989;4:231-2.
8. Spilsbury K, Semmens JB, Wisniewski ZS. Circumcision for phimosis and other medical indications in Western Australian boys. Med J Aust 2003;178:155-8.
9. Hofmann V, Kap-Herr S. Circumcision in Germany. Pediatr Surg Int 1989;4:227-8.
10. Cywes S. Circumcision in South Africa. Pediatr Surg Int 1989; 4: 233-5.
11. Coran AG. Circumcision in United States: medical and non-medical attributes. Pediatr Surg Int 1989;4:229-30.
12. Rickwood AMK, Kenny SE, Donnell SC. Towards evidence based circumcision of English boys: survey of trends in practice. B M J 2000,321:792-93.
13. Nelson CP, Dunn R, Wan J, Wei JT. The increasing incidence of newborn circumcision: data from nationwide inpatient sample. J Urol 2005;173:978-81.
14. Rickwood AMK. Medical indications of circumcision. B J U Int 1999; 83 Suppl 1:45-51.
15. Short RV. Male circumcision: a scientific perspective. J Med Ethics 2004;30:241.
16. Reynolds SJ, Shepherd ME, Risbud AR, Gangakhedkar RR, Brookmeyer RS, Divekar AD *et al.* Male circumcision and risk of HIV-1 and other sexually transmitted infection in India. Urol 2004; 63:155-8.
17. Szabo R, Short RV. How does male circumcision protect against HIV infection? BMJ 2000;320:1592-4.
18. Inungu J, MaloneBeach E, Betts J. Male circumcision and the risk of HIV infection. AIDS Reader 2005;15:130-1.
19. Senkul T, Iserl C, Sen B, Karademir K, Saracoglu F, Erden D. Circumcision in adults: effects on sexual functions. Urol 2004;63:155-8.
20. Department of State, United States Government. "Sweden". In: The international religious freedom report" 2002.(http://www.state.gov/g/drl/rls/irf/2002/13983.htm
21. Talbert LM. Adrenal cortical response to circumcision in the neonate. Obstet Gynaecol 1976;48:208-10.
22. Rawlings DJ, Miller PA, Engel RR. The effect of circumcision upon transcutaneous PO2 in term infants. Am J Dis Child 1980;134:676-8.
23. Morgan WKC. The rape of the phallus. JAMA 1965;193:123-4.
24. Warren JP. NORM UK and the medical case against circumcision. In: Denniston GG, Milos MF (eds). Sexual Mutilation- A Human Tragedy. Chapter 7, New York Plenum Press, 1997:96-8.
25. Rickwood AMK, Hemalatha V, Batcup G, Spitz L. Phimosis in boys. Br J Urol 1980, 52:147-50.
26. Rickwood AMK, Walker J. Is phimosis overdiagnosed in boys and are too many circumcisions performed in consequence? Ann R Coll Surg Engl 1989;71:275-7.
27. Griffiths D, Frank JD. Inappropriate circumcision referrals by GPs. J R Soc Med 1992;85:324-25.
28. Gordon A, Collin J. Save the normal foreskin. Br Med J 1993;306:1-2.
29. Williams N, Chell J, Kapila L. Why are children referred for circumcision? Br Med J 1993;306:28.
30. Shankar KR, Rickwood AMK. The incidence of phimosis in boys. BJU Int 1999;84:101-2.
31. Quaba O, MacKinlay GA. Changing trends in a decade of circumcision in Scotland. J Paed Surg 2004;39:1037-9.
32. Money J. Ablatio penis: normal male infant sex reassigned as a girl. Arch Sex Behav 1975,4:65-70.
33. Berman W. Urinary retention due to ritual circumcision. Paediatrics 1975;56:321.
34. Lee LD, Millar AJW. Ruptured bladder following circumcision using Plastibell device. Br J Urol 1999,65:217.
35. Kon M. A rare complication of circumcision; the concealed penis. J Urol 1983;132:573-4.
36. Gerhart JP, Rock JA. Total ablation of penis after circumcision with electrocautery: a method of management and long term follow up. J Urol 1989;142:799-801.
37. Saihaye VU, Goswami AK, Sharma SK. Skin Bridge- a complication of paediatric circumcision. Br J Urol 1990;66:214.
38. Shulman J, Ben- Hur N, Newman Z. Surgical complication of circumcision. Am J Dis Child 1964;107:149-54.
39. Holman JR, Stuessi KA. Adult circumcision. Am Family Physician 1999;15:1514.
40. Jorgensen ET, Svensson A. The treatment of phimosis in boys with a potent topical steroid (0.05% clobetasol propionate) cream. Acta Derm Venereol 1993;73:55-6.
41. Wright JE. The treatment of phimosis with topical steroids. Aust N Z J Surg 1994;64:327-8.
42. Cuckow PM, Rix G, Mouriquand PD. Preputial plasty: a good alternative to circumcision. J Paediatric Surg 1994;29:561-3.
43. He Y, Zhou XH. Balloon dilatation treatment of phimosis in boys: report of 512 cases. Chienese Med J 1991;104:491-3.
44. Lannon CM Bailey AGB, Fleischman AR: Circumcision policy statement. American Academy of Paediatric. Task force on circumcision. Paediatrics 1999;103(3):686-93.
45. Lane TM, South LM. Lateral preputioplasty for phimosis. J R Coll Surg Edin 1999:44:310-2.
46. Pascotto R, Giancotti E. The treatment of phimosis in the childhood without circumcision: plastic repair of the repuce. Minerva Chirurgica 1998;53:561-5.
47. Vaos G. Circumcision with the Nd: YAG laser contact technique compared with conventional surgery. Photomed Laser Surg 2004;22:318-22.
48. Subramaniam R, Jacobsen AS. Sutureless circumcision: a prospective randomized controlled study. Paed Surg Int 2004;20:783-5.

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