



Optimal time for neonatal circumcision: An observation-based study

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Received 16 December 2008; accepted 5 January 2009

Available online 14 February 2009

KEYWORDS

Circumcision;
Neonatal pain
perception;
Ring block;
Neonatal surgery

Abstract *Objective:* A detailed observation-based study to determine the ideal age for neonatal circumcision.

Patients and methods: A prospective study of 583 neonatal circumcisions was carried out over a 3-year period (December 2005–December 2008). First a penile ring block was performed with 1% lignocaine solution, injected with a 26G needle. Formula milk, expressed breast milk or 20% sucrose solution was given to the child *ad libitum* as a further soothing agent. Circumcision was performed utilizing the Gomco sutureless clamp technique. Neonatal/Infant Pain Scale (NIPS) was used to score the severity of pain. NIPS ≥ 2 was taken to imply a painful procedure.

Results: Only 6.5% of neonates under 1 week of age scored NIPS ≥ 2 during the procedure, but this reached 100% by the 4th week of life. There were 2 minor complications in this cohort.

Conclusion: Despite current controversy over whether it is ethical for parents to consent to a non-therapeutic neonatal circumcision, it remains a widely practiced procedure. Therefore it is important for pediatric surgeons/urologists to perform circumcision safely with minimal trauma to the neonate. This study shows that painless circumcision is possible in almost all newborns if it is performed during the first week after birth.

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Introduction

Circumcision is the oldest surgical procedure still practiced today. It is controversial as to whether non-therapeutic circumcision in the neonatal period is ethical [1,2]. However, newborn male circumcision is a widely practiced procedure in the Middle East, Africa and the USA. In South

Africa, neonatal circumcision is performed most commonly for religious/cultural reasons, followed by concern for hygiene, and more recently as a means of protection against HIV/AIDS [3].

One of the commonest questions asked by parents who wish to have their newborn son circumcised is: when is the best time for circumcision? The answer is: (a) when the child is less than 2 years of age so that he has no memory of the procedure, and (b) surgery should be performed under local anesthesia to avoid the well-known complications of general anesthesia and bleeding. In most cases this implies that the procedure should be done before the onset of

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mini-puberty of infancy, which starts at 4 weeks and ends at 3 months [4]. During this time the foreskin gradually becomes larger, thicker and has a much better blood supply which increases the risk of bleeding during circumcision. What remains to be answered is at what age a neonate feels or experiences least pain. There are a number of scales to predict severity of pain in newborns, and the aim of this study was to determine the optimal age for neonatal circumcision based on one such scoring system.

Patients and methods

A prospective study, involving 583 neonatal/infant circumcisions, was conducted over a 3-year period (December 2005 to December 2008) after obtaining human ethical approval from a local committee. This is not a randomized study because parents request the procedure at different neonatal ages, and often according to erroneous information given to them by other medical practitioners, family members or religious figureheads.

The procedure was requested directly by the parents and performed as soon as practical. Sutureless circumcision was performed for males under 5 weeks of age. Circumcision for older infants was deferred to 9 months of age and performed under general anesthesia. All circumcisions were carried out in the side-room/procedure room of a maternity ward or in the surgeon's room under sterile conditions. Assistance was provided by a professional nurse/midwife in all cases.

Circumcisions were performed using a standardized technique and by one surgeon; a penile ring block was used (2 mg/kg of 1% or 2% plain lignocaine) injected with a 26G needle. Formula milk, expressed breast milk or 20% sucrose solution was given to the child *ad libitum* as a further soothing agent. Further measures included: (a) quiet surroundings, (b) room temperature at 25 °C, (c) standard room lighting instead of theatre-type bright lights, and (d) minimal or no leg restraints during the procedure.

Circumcision was commenced within minutes of local ring block by a sterile technique. A dorsal incision in the prepuce was made to allow full retraction of the foreskin with an artery forceps. An 11–12-mm Gomco clamp was subsequently applied for 2–3 min. The foreskin was cut sharply over the clamp with a surgical blade and tincture of benzoate gauze was applied as a temporary dressing.

A Neonatal/Infant Pain Score (NIPS) scoring sheet was completed by the professional nurse or midwife assisting with the procedure and validated by parental assessment (if present) at the same time. This scale model records behavioral changes in response to painful stimuli in neonates and infants (Table 1). The NIPS is zero when a noxious stimulus is least painful and 7 when it is most painful [5]. In this study, neonates with scores <2 were considered to have had a pain-free circumcision.

Results

Infants' ages ranged from 1 to 35 days old, and their weight ranged between 1.9 and 4.7 kg at the time of circumcision. Minor bleed immediately post circumcision requiring suturing occurred in two cases (both in 3-week-old

Table 1 Neonatal/Infant Pain Score (NIPS).

Parameter	Finding	Points
Facial expression	Relaxed	0
	Grimace	1
Cry	No cry	0
	Whimper	1
	Vigorous crying	2
Breathing patterns	Relaxed	0
	Change in breathing	1
Arms	Restrained	0
	Relaxed	0
	Flexed	1
Legs	Extended	1
	Restrained	0
	Relaxed	0
	Flexed	1
State of arousal	Extended	1
	Sleeping	0
	Awake	0
	Fussy	1
Total		0–7

neonates), excluding them from this study. There were no other complications or deaths. NIPS was thus available for analysis for 581 patients.

The injection of ring block in the majority of the neonates caused a painful response (NIPS ≥2), but this was mostly noted in neonates of over 1 week of age (Table 2). During the procedure, most newborns (under 2 weeks old) either fell asleep or were indifferent to the procedure; this is suggestive of a pain-free circumcision (NIPS = 0 or 1).

In stark contrast many neonates older than 2 weeks recorded a high NIPS, and their percentages increased rapidly with increasing age. In all neonates aged 3 weeks and older, NIPS was greater than 2 (Table 1). These scores were statistically significant across different age groups.

Further analysis of the data for neonates aged <14 days revealed that neonates older than 8 days are likely to exhibit significantly more signs of pain than those younger (Table 3).

Discussion

There is on-going debate and controversy regarding non-therapeutic neonatal circumcision and whether it is ethical for parents to give consent for this procedure. However, this procedure is routinely practiced world-wide, including in the USA, and is likely to continue for the foreseeable future. In South Africa, circumcision for indigent patients is not available due to a shortage of experienced medical staff and time constraints. However, in private practice this service is available for a fee. All the patients in this study were from this group.

The parents are often given conflicting advice with regard to the timing of circumcision, and many delay the procedure for as long as 5 weeks or more as noted in this report.

The concept of pain perception in neonates has only recently been elucidated in detail [6]. Despite this evidence, gynecologists, urologists and general medical practitioners are known to circumcise infants and neonates without any local anesthesia [7]. This practice is clearly

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