Journal of Pediatric Urology (2007) 3, 495—499

Journal of Pediatric urology

Incidence and predictive factors of isolated neonatal penile glanular torsion

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Received 23 January 2007; accepted 7 March 2007
Available online 5 July 2007

KEYWORDS
Penile malformations;
Neonatal penile torsion;
Median raphe deviation;
Penile glanular torsion

Abstract *Purpose:* To determine the incidence of isolated neonatal penile glanular torsion, describe the basic characteristics, and explore the relationship between foreskin and glans torsion.
Methodology: A prospective survey was conducted of all male newborns admitted to nursery after delivery, or neonates less than 3 months presenting for circumcision. Cases with associated genital malformations were excluded.
Results: The incidence of isolated neonatal penile torsion was 27% (95% CI: 22.2%—31.84%), to the left in 99% of cases. In 3.5% of cases, the penis had an angle $<10^{\circ}$, and 9.5% $>20^{\circ}$. Using Spearman's correlational coefficient, deviation of penile raphe from the midline at the foreskin tip had a better correlation with glans torsion than deviation of raphe at the coronal sulcus (0.727 vs 0.570; both significant at $p < 0.01$).
Conclusion: Isolated neonatal penile torsion is more common than reported. The median raphe of the penis may be normal and mask unexpected glans torsion. Median raphe torsion at foreskin tip can be used as a predictor for glans torsion. Clinical significance and relation to adult penile torsion are beyond the scope of the study.

Introduction

Penile torsion is a two- or three-dimensional rotation of the penis at the level of the shaft and/or the glans [1,2]. Pediatric surgeons frequently encounter penile torsion at the neonatal stage in countries where circumcision is routinely performed after delivery. The condition can be diagnosed following delivery, or later during childhood. Neonatal penile torsion can be isolated or associated with male genital malformations [3], and the etiology is different from the adult type [4—7].

There are few publications on isolated neonatal penile torsion, and the clinical characteristics are not well known. The real incidence is difficult to evaluate for many reasons. First, isolated torsion should be separated from secondary cases due to associated penile anomalies like hypospadias [3]. Second, the deviation of the penile median raphe from the midline may or may not reflect the real angle of glanular torsion. Penile torsion should be assessed by measuring the angle of glanular torsion not foreskin alone.

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1477-5131/$30 © 2007 Published by Elsevier Ltd on behalf of Journal of Pediatric Urology Company.
doi:10.1016/j.jpurol.2007.03.002

We encountered glanular penile torsion more frequently than is reported [8]. The aims of this study were to determine the following.

1. The incidence of isolated neonatal penile glanular torsion, and its descriptive characteristics, in a country (Saudi Arabia) where circumcision is almost systematic at the neonatal stage mainly for ritual or religious reasons.
2. The correlation between glans torsion and foreskin torsion.
3. The possibility of using median raphe deviation or torsion as a predictor of glans torsion.

Patient and methods

Between July and December 2005, a prospective survey was conducted at the Saad Specialist Hospital, AL-Khobar, KSA, of all newborn candidates for circumcision (Fig. 1).

Inclusion criteria

1. Every male newborn admitted to nursery after delivery.
2. Or neonate less than 3 months of age, presenting to pediatric surgery outpatient clinic for circumcision.
3. Newborns with unilateral undescended testis, unilateral or bilateral hydrocele were not excluded.

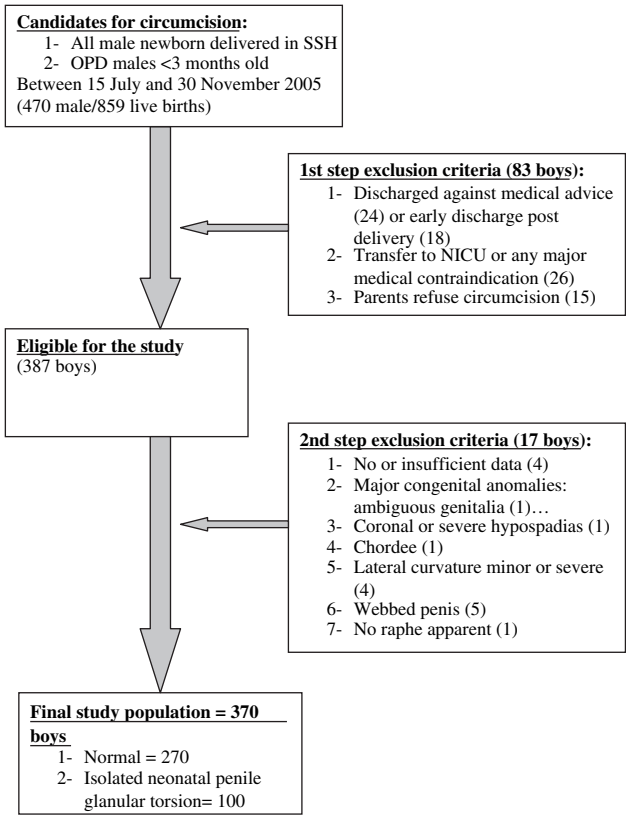

Figure 1 Flowchart of study population for isolated neonatal penile glanular torsion with inclusion and exclusion criteria. SSH, Saad Specialist Hospital; OPD, outpatient department; NICU, neonatal intensive care unit.

Exclusion criteria

1. Newborn transferred to neonatal intensive care unit or with major medical pathology.
2. Refusal of neonatal circumcision by parents.
3. Insufficient data.
4. All secondary cases: defined as associated major congenital anomaly of genital organs, or coexistence of hypospadias, chordee or lateral curvature of penis.

Sampling and recruitment

This was a hospital-based sample. A consecutive sampling technique was chosen because of absence of any seasonal factor or time-dependent trends, or any source of systematic error. Institutional review board and ethical committee approval was obtained for the study.

Strategies to enhance precision

All circumcisions and measurement were done by two surgeons personally. To ensure internal validity, and consistency between observers, the methodology of measurement has been standardized and recorded in writing. Sessions for practice of the technique were performed in the presence of both authors for the first 10 cases, and repeated every first week of each month.

Outcome of interest (endpoint)

Isolated congenital neonatal penile torsion was measured by the degree of torsion at the level of the glans, which was compared to the angle of deviation of the median raphe at two different levels: coronal sulcus and foreskin tip (Figs. 2 and 3). For the purpose of this study, angles are grouped by intervals of 10°. To measure the angles with precision and

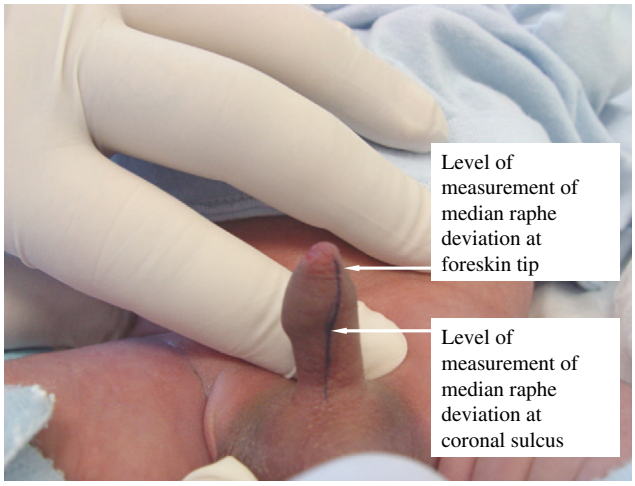

Figure 2 Ventral median raphe highlighted to improve visualization and accuracy of measurement, and indication of the three levels of measurement (coronal sulcus, foreskin tip, and glans).