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Original article

# Correlation of severity of penile torsion with type of hypospadias & ventral penile curvature and their management



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## KEYWORDS

Congenital anomalies;  
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Chordee;  
Correlation of penile torsion and chordee;  
Mobilization of urethral plate and spongiosum;  
Management of penile torsion

## Abstract

**Objective:** This study was carried out to evaluate the correlation between the severity of penile torsion on the one hand and the degree of ventral penile curvature and the type of hypospadias on the other. We also assessed the effectiveness of correction of chordee and torsion by penile degloving and mobilization of the urethral plate and the corpus spongiosum.

**Patients and methods:** This prospective study included 116 patients with hypospadias and penile torsion out of a total of 376 primary hypospadias cases seen between January 2006 and June 2013. The patients' age ranged from 8 months to 26 years with a mean age of 8.37 and a median age of 6.4 years. Prior to surgery the type of hypospadias as per location of the meatus, the presence or absence of chordee, the size of the dorsal hood and deviation of the median raphe on the dorsal hood were noted. The torque of the penile shaft (torsion) toward either side of the midline and ventral curvature was measured using a sterile small protractor around the penile shaft. The techniques used for the correction of penile torsion and chordee were penile degloving and mobilization of the corpus spongiosum with the urethral plate and the urethra.

**Results:** The abnormal penile rotation ranged from 15° to 110° (average 51.98°). In 70.69% of the patients the torque was on the left side, while it was on the right in 29.31%. 11.2% of the patients had a severe torque, while it was moderate in 37.94% and mild in 50.86% of the cases. The mean torque was 62.38° ± 23.03° in patients with distal penile (80 cases), 38.04° ± 18.50° in patients with mid penile (24 cases) and 18.25° ± 3.33° in patients with proximal penile hypospadias (12 cases) (*P* value = 0.001). Ventral curvature was seen in 71 cases. Mean ventral curvature was 38° ± 18.55°, 44.28° ± 21.11° and 73.58° ± 32.96° in patients with distal penile, mid penile and proximal hypospadias, respectively

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( $P$  value = 0.001). The procedures of choice for the repair of penile torsion were penile degloving in 11% of the cases, mobilization of the urethral plate and the corpus spongiosum in 28% of the cases, mobilization of the proximal urethra in 40% of the cases and mobilization of the urethral plate into the glans in 21% of the cases. Chordee could be corrected using penile degloving and mobilization of the urethra/urethral plate in all cases.

**Conclusions:** Penile torque is more common and severe in distal hypospadias, while ventral curvature is seen more often in proximal hypospadias. The degree of torsion is inversely proportional to the severity of ventral curvature. Techniques for the repair of penile torque and ventral curvature include penile degloving and mobilization of the urethral plate with the corpus spongiosum and the urethra.

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## Introduction

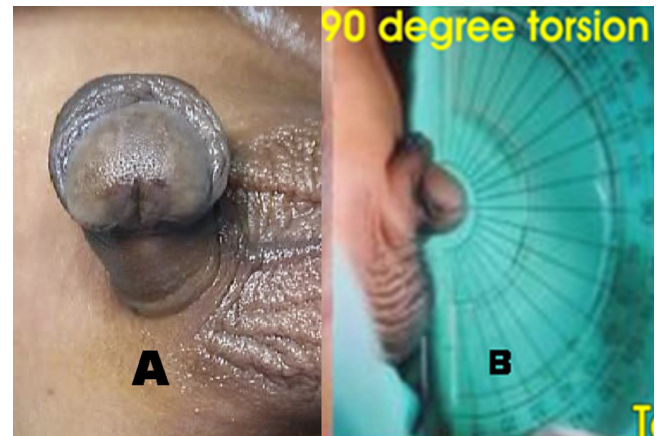
Penile torsion is a congenital deformity with helical rotation of the corporal bodies of the penile shaft, while the proximal parts of the corporal bodies remain fixed at the attachment with the pubic rami. The usual direction of penile torsion is counterclockwise (i.e. toward the left) with the urethral meatus in oblique position [1,2]. The median raphe may extend in a spiral manner from the base of the penis ventrally and around the penile shaft. Depending on the degree of rotation from the midline, torsion may be classified as mild ( $<45^\circ$ ), moderate ( $45\text{--}90^\circ$ ) and severe ( $>90^\circ$ ) [3]. The incidence of isolated penile torsion has been reported to be 1.7% to 27%, that of severe torsion to be 0.7% [1,2]. Torsion is also found to be associated with epispadias, hypospadias and chordee without hypospadias. Penile torsion with hypospadias is an overlooked entity the true incidence of which is unknown. It is commonly associated with anterior hypospadias [4,5]; only one study describes penile torsion with distal hypospadias [5]. While there is no need for treating an isolated penile torque of less than  $60^\circ$ , which primarily presents a cosmetic problem, penile torsion associated with hypospadias and chordee should be corrected. Once a patient is subjected to hypospadias repair, one should be aware of the possible presence of penile torsion and, if present, it should be corrected at the same time. The importance of recognition of torsion lies in the fact that a simple additional maneuver such as penile degloving and re-attaching is all that may be required for the correction of torsion during hypospadias repair. Techniques for the repair of torsion include penile degloving with skin re-attachment [2,4,5], dorsal dartos wrap rotation [3], pubic periosteal stitch [6], untwisting plication sutures [7] and mobilization of the urethral plate and urethra [4,8,9]. The correlation between the degree of penile torsion on one hand and the type of chordee without hypospadias and severity of ventral penile curvature on the other has been reported in only one study so far [4].

Therefore, the objective of this study was to evaluate the correlation between the severity of penile torsion on one hand and the degree of ventral penile curvature and the type of hypospadias on the other and to assess the effectiveness of correction of the chordee and torque by penile degloving and mobilization of the urethral plate and corpus spongiosum.

## Patients and methods

### Patient selection

A prospective study of 116 patients with penile torsion with hypospadias operated between January 2006 and June 2013 was



**Figure 1** (A)  $90^\circ$  right-sided torsion. (B) Measuring penile torsion with a modified sterile protractor

carried out. Out of a total of 391 cases documented in our hypospadias registry, there were 376 cases with primary hypospadias. The patients' age ranged from 8 months to 26 years with a mean age of 8.37 and a median age of 6.4 years. The patients were evaluated by clinical examination assessing the type of hypospadias as per location of the meatus, the presence or absence of chordee, the size of the dorsal hood and the deviation of the median raphe on the dorsal hood. All the patients were operated by a single surgeon (ALB) with the same type of instruments and similar suture material. Only patients with primary hypospadias who had a penile torque  $>15^\circ$  to either side were included in the study. Patients requiring redo hypospadias repair and those with perineal or perineo-scrotal hypospadias were excluded. The degree of penile torsion to either side was measured using a small sterile protractor around the penile shaft (Fig. 1). The extent of the median raphe both proximally to the meatus and distally at the dorsal hood was noted (Fig. 2A and B), as well as the degree of deviation of the median raphe from the midline. Institutional Ethical Committee clearance and consent of the parents/patients was taken for data evaluation, photographs and inclusion in study.

### Surgical technique

The penile torsion is evaluated by using a sterile modified protractor (Fig. 1) which measures the rotation of the urethral meatus from the midline. The distal extent of the median raphe is marked on the dorsal hood or foreskin. A Gittes test (intracorporeal saline injection and simulated erection) is used to assess the degree of chordee

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