



Penile Torsion: an Overlooked Anomaly with Distal Hypospadias

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Purpose: To identify the incidence of penile torsion among patients with hypospadias, while using a simple and objective method to measure the degree of rotation.

Materials & Methods: From December 2007 to March 2009, all boys presenting to our department for hypospadias repair (100 boys) were examined for associating penile torsion. The angle of penile rotation was measured on an end-on digital photograph of the penis, using MillenMed DICOM viewer program for image analysis. Two techniques were used to correct penile torsion. In group A (9 patients), we used the technique of degloving and repositioning the penile skin. In group B (10 patients), we applied the technique of dorsal dartos flap rotation.

Results: Penile torsion was present in 19 out of 58 patients with anterior hypospadias (32.8%), while none of 42 patients with posterior hypospadias had associating penile torsion. Follow-up showed satisfactory correction of penile torsion in 3 out of 9 patients in group A; and in 8 out of 10 patients in group B.

Conclusion: Penile torsion is a common association with anterior hypospadias (32.8%), and its correction can be simply performed during the hypospadias repair adding to a better cosmetic outcome. Dorsal dartos flap rotation seems to be more effective for correction of penile torsion than simply degloving and repositioning the penile skin.

Index Word: penis; hypospadias; abnormalities.

INTRODUCTION

Penile torsion is a rotational defect of the penile shaft. Abnormal penile rotation, usually counterclockwise, is seen independently or in association with other penile anomalies such as hypospadias. Surgical techniques for correction of penile torsion vary from degloving the penis and repositioning the skin to more complex techniques involving the corporal tissue¹. In 2004, Fisher and Park reported a technique using the dorsal dartos flap to correct penile torsion in 8 pediatric patients². In this report, we tried to identify the incidence of penile torsion among patients with hypospadias while using a simple and objective method to measure the degree of rotation.

PATIENTS AND METHODS

From December 2007 to March 2009, all boys presenting to our department for hypospadias repair (100 boys) were examined for associating penile torsion. To measure the degree of torsion both pre and post-operatively, an end-on digital photograph of the penis was taken with the patient in supine position and the penis unsupported (fig. A). The angle of penile rotation was measured on the photograph, using MillenMed DICOM viewer program for image analysis, based on the orientation of the urethral groove (meatus) relative to the vertical position (fig. B).

Surgical technique: Operations were done by 2 surgeons (the authors). 2 techniques were used to correct penile torsion based on surgeon preference. In group A (9 patients) we used the technique of degloving the penile skin by dividing the adhesions along the entire penile shaft, and repositioning the skin bringing the twisted median raphe to its straight direction³. In group B (10 patients) we applied the technique of dorsal dartos flap rotation described by Fisher and Park in 2004². The dartos flap, after its dissection from the dorsal penile skin, was rotated around the side of the penile shaft opposite to the direction of torsion and attached to its ventral aspect. This creates a rotational force that counterbalances that of penile torsion (fig. C).

Regarding the hypospadias repair, a TIP procedure was performed in 15 patients⁴, MAGPI in 3, and no repair was needed in 1 patient with glanular hypospadias.

RESULTS

Penile torsion was present in 19 out of 58 patients with anterior hypospadias (glanular, coronal, and distal penile) (32.8%); however, none of 42 patients with posterior hypospadias had associating penile torsion.

The direction of penile torsion was counterclockwise in 15 patients (79%), and clockwise in 4 (21%). The degree of rotation ranged from 19 to 53 preoperatively (mean 34.8).

The follow-up period ranged from 2 to 15 months (mean 6.3 months). Hypospadias repair was satisfactory in all patients. In group B (dartos flap rotation), 8 out of 10 patients achieved satisfactory correction of penile torsion (residual rotation less than 5 degrees), while only 3 out of 9 had achieved satisfactory correction of penile torsion in group A (tables 1&2).

Table 1: Group A (Degloving and repositioning the penile skin)

Patient	Age in months	Direction of rotation	Degree of rotation preoperative	Meatal position	Hypospadias repair	Follow up in months	Degree of rotation postoperative
1	36	Counter-clockwise	30	Distal penile	TIP	15	26
2	18	Counter-clockwise	29	Distal penile	TIP	12	Corrected
3	6	Counter-clockwise	42	Distal penile	TIP	11	30
4	36	Counter-clockwise	39	Coronal	TIP	9	25
5	16	clockwise	27	Distal penile	TIP	8	Corrected
6	9	clockwise	19	Coronal	TIP	7	Corrected
7	12	clockwise	35	Distal penile	TIP	4	21
8	12	Counter-clockwise	37	Distal penile	TIP	3	29
9	11	Counter-clockwise	40	Distal penile	MAGPI	2	28



(A) Digital photograph of a patient (11 months old) with glanular hypospadias and penile torsion



(B) The angle of rotation measured on the photograph using MillenMed DICOM viewer program for image analysis



(C) Dorsal dartos flap rotated around the side of penile shaft opposite to the direction of penile torsion



(D) Complete correction of penile torsion

Table 2: Group B (Dorsal dartos flap rotation)

Patient	Age in months	Direction of rotation	Degree of rotation preoperative	Meatal position	Hypospadias repair	Follow up in months	Degree of rotation postoperative
1	18	Counter-clockwise	29	Distal penile	TIP	15	Corrected
2	14	Counter-clockwise	41	Distal penile	TIP	13	Corrected
3	18	Counter-clockwise	37	Distal penile	TIP	7	28
4	6	clockwise	46	Glanular	MAGPI	3	33
5	16	Counter-clockwise	26	Glanular	None	3	Corrected
6	11	Counter-clockwise	45	Glanular	MAGPI	2	Corrected
7	12	Counter-clockwise	22	Coronal	TIP	2	Corrected
8	12	Counter-clockwise	34	Coronal	TIP	1	Corrected
9	21	Counter-clockwise	53	Distal penile	TIP	1	Corrected
10	10	Counter-clockwise	28	Glanular	MAGPI	1	Corrected

DISCUSSION

Few data exist in the literature about congenital penile torsion. The true incidence is unknown and the etiology is unclear^{1,5,6}. Some authors believe that the primary defect is abnormal skin attachment; others believe that it is caused by asymmetric development of the corpora cavernosa¹. In this report, we found penile torsion to be common among patients with anterior hypospadias (32.8%), while it was absent among patients with posterior hypospadias when ventral skin is deficient. This finding may suggest that penile torsion is caused by abnormal skin attachment; however, that may not be the only causative factor, since torsion is not always corrected by penile degloving⁷.

In most reports, the method of measuring the degree of penile torsion is not clarified. Pierrot and Muthurajan described a method using a sterile small protractor with modification for a better adjustment around the penile shaft⁵. In this report, we introduce both simple and objective method to measure the degree of penile torsion. The angle of rotation is measured on a digital end-on photograph of the penis, using a software program which is used by radiologists for image analysis. This can be applied

both pre- and post-operatively providing an objective evaluation of the corrective surgery.

Congenital penile torsion is a benign condition which may need no treatment especially for its mild degrees⁸; however, in this report, we found penile torsion to be a common association with anterior hypospadias (32.8%), and its correction can be simply performed during the repair of hypospadias adding to a better cosmetic outcome. This requires being aware of this common association while examining patients with hypospadias pre-operatively.

In this study, we applied 2 different techniques for correction of penile torsion associating hypospadias. In group A, we used the technique of degloving the penis and repositioning the skin bringing the twisted median raphe back to its straight position. Only 3 cases in this group (33%), who had an angle of rotation less than 30, achieved satisfactory correction of penile torsion. This agrees with many authors who describe this technique to be only effective for mild forms of penile torsion^{1,2,8}. However; Tryfonas and colleagues reported satisfactory results applying this technique for more severe degrees of penile torsion, but with suturing the skin in an overcorrected position⁹.

After proving its efficacy in decreasing the incidence of urethrocutaneous fistulae, the dorsal dartos flap has been widely utilized by urologists to cover their urethroplasties. In 2004, Fisher and Park described a technique utilizing the dorsal dartos flap rotation to correct counterclockwise penile torsion. In our study (group B), we applied a similar technique where the dorsal dartos flap was rotated around the side of penile shaft opposite to the direction of penile torsion and attached to its ventral aspect. This creates a rotational force that counterbalances that of penile torsion. In this group, satisfactory correction of penile torsion was achieved in 8 cases (80%). Fisher and Park (2004) reported 100% success of this technique², while 64% achieved complete resolution of penile torsion in the series of Bauer and Kogan in 2009¹⁰. Failure of this technique might be explained by the flap becoming unattached, or being inadequately placed from the start. In this report, the former is an unlikely cause, as it would have resulted also in some sort of failure in the hypospadias repair. To avoid the risk of under or over correction, the amount of flap rotation should be determined with respect to the degree of torsion, and still some final adjustments should be made during skin closure. For penile torsion associating hypospadias, the dorsal dartos flap can have the dual benefit of correcting penile rotation and providing vascular tissue support to the urethroplasty².

CONCLUSION

Penile torsion is a common association with anterior hypospadias (32.8%), and its correction can be simply performed during the hypospadias repair adding to a better cosmetic outcome. Dorsal dartos flap rotation seems to be more effective for correction of penile torsion than simply degloving and repositioning the penile skin .

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