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Assessment of postoperative outcomes of hypospadias repair with validated questionnaires

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ABSTRACT

Purpose: A standardized assessment for the optimal repair of hypospadias remains elusive. This study utilized validated questionnaires to assess the postoperative functional, cosmetic, and psychosocial outcomes of hypospadias repair.

Materials and methods: 172 patients who underwent hypospadias repair under the care of a single surgeon were identified. 25 agreed for follow-up using the validated questionnaires of Hypospadias Objective Scoring Evaluation (HOSE), Pediatric Penile Perception Scale (PPPS), and Pediatric Quality of Life Inventory (PedsQL™4.0).

Results: Mean follow-up was 59 months postoperatively (range 7–113 months). Techniques used included tubularized incised plate urethroplasty, meatal advancement and glanuloplasty, and a 2-stage repair. 23 of 25 patients achieved a HOSE score of 14 or more (maximum of 16). The PPPS scores correlated with severity of the hypospadias. Those with glanular hypospadias (mean score = 10) scored higher than those with coronal (mean score = 9) and penile/penoscrotal hypospadias (mean score = 7). There was no correlation between PedsQL™4.0 scores and the severity of hypospadias or procedure used.

Conclusion: Validated questionnaires revealed generally good functional, cosmetic, and early psychosocial outcomes after hypospadias repair. The use of validated questionnaires in routine follow-up sessions may facilitate objective assessment of both functional outcomes and patient satisfaction.

Hypospadias represents a common condition that affects 1 in 200–300 male births [1], though the prevalence has been reported to be as high as 1 in 125 boys [2]. There exist well over 200 different repair techniques for hypospadias described in the literature [3]. The optimal repair technique for hypospadias remains elusive: even popular surgical repairs such as the tubularized incised plate (TIP) urethroplasty and Mathieu procedures have been modified to suit individual variations of hypospadias phenotypes, as well as reflecting individual surgeon preference [4]. Postoperative outcomes have been emphasized to include functional, cosmetic as well as psychosocial outcomes, with longer term review deemed necessary for adequate evaluation of surgical success [5,6]. Validated scales give the advantage of allowing surgeons to more objectively assess postoperative outcomes, as well as providing a platform on which to discuss outcomes with colleagues. Long term follow-up may also be readily performed by the use of scales, which can also be used as a screening tool, emailed as an online survey or posted to evaluate which patients require further clinical consultation.

This study utilized validated questionnaires to assess the postoperative functional, cosmetic and psychosocial outcomes of hypospadias repair of patients under the care of a single surgeon at a pediatric tertiary center.

1. Methods

A retrospective medical records review was undertaken of all patients who underwent a hypospadias repair procedure from 1996–2013 under the care of a single surgeon (DTC), in order to ensure uniformity in the operative approach. Formal approval for the medical records review was obtained from the Ethics Committee of The Children's Hospital at Westmead.

All patients were invited by telephone to attend a consultation clinic for follow-up of their hypospadias repair. Follow-up was defined as the time between the date of operation and the date of the clinic. Patients included in this study were boys with all types of hypospadias including distal to proximal/penoscrotal, with no limits placed on age at operation or type of repair used. The boys were interviewed and examined in the presence of their parents by a surgeon; self-assessment and quality of life questionnaires were then completed with an independent interviewer to avoid bias when answering the questionnaires. Both the patient and his parents were asked to complete the questionnaires.

Three validated questionnaires were used in the follow-up clinic: Hypospadias Objective Scoring Evaluation (HOSE), Pediatric Penile Perception Score (PPPS) and Pediatric Quality of Life Inventory (PedsQL™4.0).

Abbreviations: HOSE, Hypospadias Objective Scoring Evaluation; MAGPI, Meatal advancement and glanuloplasty incorporated; PedsQL™4.0, Pediatric Quality of Life Inventory; PPPS, Pediatric Penile Perception Score; TIP, Tubularized incised plate urethroplasty.

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The Hypospadias Objective Scoring Evaluation (HOSE) [7] has been validated as a pediatric objective scoring system for evaluating the outcomes of hypospadias repair and incorporates the outcomes of meatal location and shape, urinary stream, the straightness of erection and any urethral fistula. A score of 14 or more (maximum score of 16) was suggested by the authors to infer an acceptable outcome with the meatus at least at the proximal glans, a single urinary stream and only moderate angulation of the penile shaft.

The Pediatric Penile Perception Score (PPPS) consists of a standardized questionnaire "concerning penile self-perception with regard to meatus, glans, skin and general appearance" [8]. This was assessed through a 4 point scale (scored from 0–3) from very dissatisfied to very satisfied, with no neutral answers, giving a maximum score of 12. This score was completed by patients, parents as well as the surgeon.

The Pediatric Quality of Life Inventory (PedsQL™4.0) [9] was developed as a validated pediatric quality of life scale, with subsets dependent on age. It includes 4 domains — physical, emotional, social and school functioning. Likert scales from zero to 4, with scores then linearly transformed to a 0 to 100 scale were utilized. These were completed separately by both the patient and his parents.

2. Results

A total of 172 patients were identified who had undergone hypospadias repair. 39 patients responded and 25 patients attended the clinic. Out of date contact details, no response and those who had other obligations accounted for the low response rate. Because of time constraints, those who did not respond or missed the clinic were not contacted again, but were maintained on a list to be contacted again for future clinics.

Of the patients that attended the review clinic, the mean age at surgery was 25 months with a range from 8 to 71 months. The location of the meatus preoperatively was glanular in 2, coronal in 13, subcoronal in 1, distal penile in 3, midshaft penile in 2, proximal penile in 1, and penoscrotal in 3. Preoperatively, 1 was reported to have meatal stenosis at first presentation, with 5 having chordee. One penoscrotal hypospadias presentation also presented with a penoscrotal transposition; another had a bifid scrotum.

The procedure used included TIP repair in 19, meatal advancement and glanuloplasty (MAGPI) repair in 3, and a 2 stage repair in 3 patients.

The mean age at follow-up in 2014 was 84 months, with a range of 15 to 164 months. The median length of time from procedure to follow-up was 58 months, with a range from 7 to 113 months.

2.1. HOSE

The mean HOSE score was 15 (range 12–16) out of a maximum score of 16 (Table 1). While all types of hypospadias had a mean score of above 14, there were a significant number of patients who experienced spraying of urine (7 out of 25), which do not satisfy the definition of an acceptable outcome (Table 2). These patients, as well as 2 patients who scored below 14, would require further follow-up and investigation. 24 of 25 patients had a meatus on the glans postoperatively; 17 patients achieved a vertical meatal shape (68%) with 18 achieving a single stream (72%). All patients except one achieved a straight erection, with 1 patient experiencing mild angulation. One patient had a single fistula at follow-up.

Table 1
Mean HOSE scores.

Meatal location (preoperative)	Mean HOSE score
Glanular	15
Coronal	15
Subcoronal/distal penile	15
Midshaft penile	15
Penoscrotal/proximal penile	14
Overall	15

Table 2
Variables/subset scores of HOSE.

Variables of HOSE	HOSE score	Number of patients (N = 25)	Percentage for each HOSE variable
Meatal location			
Distal glanular	4	21	84
Proximal glanular	3	3	12
Coronal	2	1	4
Penile shaft	1	0	0
Meatal shape			
Vertical slit	2	17	68
Circular	1	8	32
Urinary stream			
Single stream	2	18	72
Spray	1	7	28
Erection			
Straight	4	24	96
Mild angulation (<10)	3	1	4
Moderate angulation	2	0	0
Severe angulation	1	0	0
Fistula			
None	4	24	96
Single subcoronal or more distal	3	1	4
Single proximal	2	0	0
Multiple or complex	1	0	0

2.2. PPPS

The PPPS scores reflected the severity of the preoperative hypospadias. Patients with glanular hypospadias scored higher (mean score = 10) than those with coronal hypospadias (mean score = 9) and penile/penoscrotal hypospadias (mean score = 7) (Table 3). The PPPS was not asked of children younger than 5 years old at follow-up, as we did not believe that children this young can understand and judge the appearance of the penis. It is interesting to note that the surgeon's PPPS score was higher than that of the patients' and parents' across the range of hypospadias.

2.3. PedsQL™4.0

All patients exhibited excellent quality of life scores on the PedsQL™4.0, with most patients scoring greater than 80 (maximum score 100); there was little correlation with the type of hypospadias and the quality of life scores (Table 4). Parent's perceptions of their son's qualify of life were similarly excellent, though with lower scores in general (Table 5). One patient with penoscrotal hypospadias also had significant comorbidities including intellectual disability, which impacted on his quality of life.

3. Discussion

The most appropriate postoperative follow-up period for hypospadias has been debated in the literature: routine follow-up periods appear to vary widely [10] — from schedules of 3 months, 6 months and 1 year

Table 3
PPPS scores.

Meatal location (preoperative)	Mean PPPS score (child)	Mean PPPS (parent)	Mean PPPS score (surgeon)
Glanular	10	10	11.5
Coronal	9	10	12
Subcoronal/distal penile	7	9	10
Midshaft penile	–	8.5	9.5
Penoscrotal/proximal penile	7	7	11