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Meatal Mismatch and GMS Scoring in Hypospadias Repair

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Disclosures

• No authors have any disclosures to report



Background

 Glans-Meatus-Shaft (GMS) score = preoperative phenotypic scoring system

Glans (G) Score:

- 1. Glans above average in size; Urethral plate distinct, deeply grooved
- 2. Glans average in size; Urethral plate mostly distinct, grooved
- 3. Glans small; Urethral plate narrow, somewhat indistinct, flat
- 4. Glans very small; Urethral plate indistinct, narrow and flat

Meatus (M) Score:

- 1. Glanular
- 2. Coronal
- 3. Mid or Distal shaft
- 4. Proximal shaft, penoscrotal, perineal

Shaft (S) Score:

- 1. No chordee
- 2. Mild (<30°) chordee
- 3. Moderate (30-60°) chordee
- 4. Severe (>60°) chordee



Background

 Glans-Meatus-Shaft (GMS) score = preoperative phenotypic scoring system

 Higher GMS scores have been associated with higher rates of postoperative complications



(Huang, 2018)



Background

- <u>Meatus component of GMS score is assessed</u> <u>prior</u> to degloving
 - -M0: glanular
 - -M1: coronal
 - -M2: distal/midshaft
 - -M3: proximal

 Meatus location often changes intra-operatively after penile degloving and urethral cutback

 Causes "mismatch" between pre- and post-degloving meatus location



Meatal Mismatch Definitions

Meatal upstaging: meatus moves proximally after degloving



Adapted from Elumalai, 2017



Meatal Mismatch Definitions

Meatal upstaging: meatus moves proximally after degloving

Meatal downstaging: meatus moves <u>distally</u> after degloving



Adapted from Elumalai, 2017



Aims

• To identify the association of meatal mismatch with postoperative urethrocutaneous fistula development



Hypothesis

Meatal upstaging would be associated with higher risk of urethrocutaneous fistula development





Methods

- Retrospective cohort study
 - Meatal upstaging vs. meatal downstaging vs. no meatal mismatch
 - Meatus locations (per GMS score): glanular, coronal, distal/midshaft, proximal
- Single-center
- Primary repair: 07/2011-03/2018



Methods

- Retrospective cohort study
 - Meatal upstaging vs. meatal downstaging vs. no meatal mismatch
 - Meatus locations (per GMS score): glanular, coronal, distal/midshaft, proximal
- Single-center
- Primary repair: 07/2011-03/2018
- Inclusion:
 - Included within prospectively managed database of intraoperative data
- Exclusion:
 - No follow-up
 - No penile degloving
 - Incomplete medical record

Primary Outcome: development of urethrocutaneous fistula



Cohort





Mismatch Table

	Post-degloving GMS meatal location			
Pre-degloving GMS meatal location, %	Glanular (M0)	Coronal (M1)	Distal/Midshaft (M2)	Proximal (M3)
Glanular (M0)				
Coronal (M1)				
Distal/Midshaft (M2)				
Proximal (M3)				



No Meatal Mismatch • N=386/485 (80%)

	Post-degloving GMS meatal location			
Pre-degloving GMS meatal location, %	Glanular (M0)	Coronal (M1)	Distal/Midshaft (M2)	Proximal (M3)
Glanular (M0)	<mark>68%</mark>			
Coronal (M1)		<mark>68</mark> %		
Distal/Midshaft (M2)			86%	
Proximal (M3)				<mark>82%</mark>



Meatal Mismatch - Upstaging N=75/485 (15%)

	Post-degloving GMS meatal location			
Pre-degloving GMS meatal location, %	Glanular (M0)	Coronal (M1)	Distal/Midshaft (M2)	Proximal (M3)
Glanular (M0)	68%	10%	15%	7%
Coronal (M1)		68%	27%	3%
Distal/Midshaft (M2)			86%	12%
Proximal (M3)				82%



Meatal Mismatch – Downstaging N=24/485 (5%)

	Post-degloving GMS meatal location			
Pre-degloving GMS meatal location, %	Glanular (M0)	Coronal (M1)	Distal/Midshaft (M2)	Proximal (M3)
Glanular (M0)	68%	10%	15%	7%
Coronal (M1)	2%	68%	27%	3%
Distal/Midshaft (M2)	2%	0%	86%	12%
Proximal (M3)	0%	0%	18%	82%



Outcomes

 Median follow-up: 9.7 months (IQR: 8.1-13.0 months) after final planned stage

Fistula Development: 56/485 (12%)
At a median 6.8 months of follow-up (IQR: 1.8-14.6 months)



Base Model





Base Model



Full Model







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Conclusions

 Meatal upstaging is associated with increased risk of shortterm post-operative urethrocutaneous fistula development

 GMS scoring should consider adding modifier term for meatal upstaging to enhance <u>post-operative</u> counseling/expectations



Thank you!







Variable	Base model	Full model
	HR (95% CI), p-value	HR (95% CI), p-value
GMS pre-degloving meatal location		
Glans	Referent	Referent
Corona	0.54 (0.09-3.24), p=0.50	0.60 (0.10-3.57), p=0.57
Distal/midshaft	2.46 (0.59-10.30), p=0.22	3.92 (0.91-16.92), p=0.07
Proximal locations	3.20 (0.66-15.47), p=0.15	8.08 (1.42-46.00), p=0.02
Chordee severity		
None	Referent	Referent
1-29 degrees	5.22 (0.70-39.15), p=0.11	5.37 (0.72-40.31), p=0.10
30-60 degrees	7.37 (0.96-56.67), p=0.06	6.12 (0.79-47.25), p=0.08
>60 degrees	6.90 (0.88-54.31), p=0.07	5.88 (0.74-46.44), p=0.09
Staged repair		
Single-stage	Referent	Referent
Multi-stage	0.30 (0.11-0.83), p=0.02	0.25 (0.09-0.68), p=0.01
Meatal mismatch	-	
No mismatch	-	Referent
Meatal downstaging	-	1.00 (0.30-3.36), p=1.00
Meatal upstaging	-	3.82 (1.87-7.83), p<0.001