

## APPENDIX A. SEARCH STRATEGY

(Hypospadias OR ventral curvature OR chordee) AND (Corporotomy OR corporotomies OR Ventral straightening)

Sept 1, 2021

PUBMED (77)

("hypospadias"[MeSH Terms] OR "hypospadias"[All Fields] OR "hypospadias"[All Fields] OR ("ventral"[All Fields] OR "ventrale"[All Fields] OR "ventrally"[All Fields] OR "ventrals"[All Fields]) AND ("curvature"[All Fields] OR "curvatures"[All Fields])) OR "chordee"[All Fields]) AND ("corporotomies"[All Fields] OR "corporotomy"[All Fields] OR ("corporotomies"[All Fields] OR "corporotomy"[All Fields]) OR ("ventral"[All Fields] OR "ventrale"[All Fields] OR "ventrally"[All Fields] OR "ventrals"[All Fields]) AND ("straighten"[All Fields] OR "straightened"[All Fields] OR "straightening"[All Fields] OR "straightens"[All Fields]))

EMBASE (124)

1	exp hypospadias/	11442
2	hypospadias*.ti,ab,kw.	9456
3	(hypospadias adj2 (correction* or repair* or procedure* or modify*)).ti,ab,kw.	2569
4	exp chordee/	879
5	(chordee adj2 (correction* or repair* or procedure* or modifi*)).ti,ab,kw.	169
6	ventral curvature.mp.	253
7	ventral curvature.ti,ab,kw.	251
8	(ventral curvature adj2 (correction* or repair* or procedure*)).ti,ab,kw.	11
9	or/1-8	12961
10	corporotomy.ti,ab,kw.	133
11	corporotomies.ti,ab,kw.	59
12	ventral lengthening.ti,ab,kw.	14
13	ventral straightening.ti,ab,kw.	2
14	dorsal plication.ti,ab,kw.	105
15	fairy cuts.ti,ab,kw.	1
16	or/10-15	279
17	9 and 16	124

SCOPUS (198)

(Hypospadias OR ventral curvature OR chordee) AND (Corporotomy OR corporotomies OR Ventral straightening)

CENTRAL (1)

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#1	hypospadias Limits	388
#2	chordee Limits	31
#3	ventral curvature Limits	14
#4	corporotomy Limits	6
#5	corporotomies Limits	2
#6	ventral lengthening Limits	1
#7	ventral straightening Limits	0
#8	fairy cut Limits	3
#9	plication Limits	294
#10	(#4 OR #5 OR #6 OR #7 OR #8 OR #9) Limits	305
#11	(#1 OR #2 OR #3) AND #10 Limits	1

PROQUEST (856) \*n Included 100 to the pool merge

(Hypospadias OR ventral curvature OR chordee) AND (Corporotomy OR corporotomies OR Ventral straightening OR Fairy cuts OR plication)

APPENDIX B. SUPPLEMENTARY TABLES

Supplementary Table 1.												
Study (year)	Country source	Study method	Sample size	Mean/median age (yr/ mo)	Patient characteristics	Comparators of interest	The technique (number of patients)	Success rates	Mean followup (yrs)	Residual curvature	Complications	Remarks
Abosena et al., 2019	USA	Retrospective cohort (2000- 2017)	59	Range: 14-21-year-old	Patients with recurrent penile curvature following hypospadias repair	Plication vs. Mobilization and Corporotomy vs. Corporotomy	i) One-stage dorsal replication and skin detethering (32) ii) One-stage urethral mobilization and corporal/dermal grafts (12) iii) Staged corporal/dermal and grafted TIP (15)	Overall 96.4%	Median 30 mo, (range 6-48 mo)	i) Nesbit: 1 (6.25%) Baskin: 1 (7.14%) ii) 0 iii) 0	i) Wound dehiscence: 2 (3.63%)	Update study of Howe et al., 2017, where clustered outcomes were being previously. Residual curvature from dorsal plications.
Badawy et al. (2020)	Egypt	Retrospective Cohort (2011- 2018)	43	median 12mo (6-132 IQR 16)	All proximal hypospadias > 30-degree curvature with staged tubularized autograft repair (STAG)	UP mobilization +DP vs. UP with ventral lengthening	Urethral mobilization with DP (27) vs. urethral mobilization with ventral lengthening (16)	72.9% overall (could not subgroup)	3.2 years	-	Graft plate scarred 2/27 vs 2/16	Included only complication data for meta-analysis
Braga L et al (2008)	Canada	Retrospective Cohort (1996- 2004)	100	i) 17mo (range 9 – 56) yr ii) 17.8mo (range 10-58)	Patients with penoscrotal or more proximal hypospadias, penile curvature >45°	Plication vs. Corporotomy (graft or TV flap)	i) Ventral Lengthening (32) ii) Dorsal Plication (68)	i) 90.63% . ii) 72.06% (29/32 vs 49/68)	mean follow-up 65mo (ranges 29-120mo) i) 62mo (range 30- 116)	i) Ventral Lengthening: 3 (9.4%) ii) Dorsal Plication: 19 (27.9%)	Urethrocutaneous Fistula: 8 Ventral Lengthening (25.0%), 20 Dorsal Plication (29.4%)	Distinct dataset from Salle et al 2016
Cheng et al (2003)	USA	Retrospective Cohort (?)	14	mean age < 1 year	Underwent staged hypospadias repair	Corporal grafting (SIS vs. dermal graft) vs. Plication (All corrected)	i) Dorsal plication (4) vs. ii) Dermal Corporal Body Grafting (3) iii) SIS Corporal Body Grafting (7)	100%, 100%, 100%	range: 6 months to 3 years	-	Of entire cohort: i) Meatal Stenosis: 1 (7.14%) ii) Urethrocutaneous Fistula: 1 (7.14%) iii) Diverticulum: 1 (7.14%)	
Gershbaum MD et al. (2002)	USA	Retrospective Cohort (1980- 1995)	34	-	Children undergoing 1 stage or 2 stage perineoscrotal hypospadias + chordee repair. Chordee repair differed between the two groups.	Single vs. 2-stage perineoscrotal hypospadias + chordee repair -> single stage is Nesbit vs. plication while 2 stage is dermal vs. tunica vaginalis grafting.	i) 1 stage - Plication (Nesbit or Tunica albuginea plication) (23) ii) 2 stage – Tunica albuginea incision then Tunica vaginalis flap or Dermal Graft (11)	i) 21.0% ii) 63%	5 to 15 years	i) Plication: 14 (61.0%) ii) TA or Dermal Graft: 2 (18.0%)	One Stage: i) Diverticulum: 3 (14.0%) ii) Distal Breakdown: 3 (14.0%) iii) Anastomosis Stricture: 1 (1.0%) Two Stage: i) Diverticulum: 1 (9.0%)	Success 5 (excellent- no chordee) 4 (satisfactory- some irregularity) 14 (poor- recurrence of chordee) vs 7 (excellent- no chordee) 2 (satisfactory- some irregularity) 2 (poor- recurrence of chordee)
Kramer et al. (1982)	USA	Retrospective Cohort (?)	20	8 yrs (range: 1 - 20 yr)	children with chordee without hypospadias	Nesbit Plication vs. Transection corporotomy vs. Allen Spence technique	i) Nesbit (8) ii) Allen-Spence technique (8) iii) division of urethra w/ staged UP (2) iv) mobilize urethra with fibrous tissue excision (2)	90.0% (6) v 100% (8) v 100% (2) v 100% (2)	12 mo minimum	10% (2) v 0 v 0 v 0	-	
Pippi Salle (2016)	Canada	Retrospective Cohort (2003- 2013)	140	i) TIP: 17.8mo ii) DIG: 15.3 mo iii) Staged Repair: 17.6mo	Patients with proximal hypospadias undergoing TIP, DIG, or Staged Repair	Degloving vs. Plication (VC 30-50) vs. Corporotomy (VC >50)	i) TIP: Dorsal plication (27) ii) DIG: Dorsal plication (20) iii) Staged Repair: UP division & TA incisions (59) ** DP 7 vs VL (DTITA) 17	i) TIP: 86.0% ii) DIG: 82.7% iii) Staged Repair: 95.0%	i) TIP: 48.3 mo (6-123) ii) DIG: 35.7 (8-91) iii) Staged Repair: 29.3 (6-127)	i) TIP: 8 (14.0%) ii) DIG: 4 (17.3%) iii) Staged Repair: 3 (5.00%) ** 2 VC recurrence for DP, 1 for DTITA.	Urethrocutaneous Fistula: 18 TIP (31.5%), 3 DIG (13.0%), 7 SR (11.6%) Glans Dehiscence: 3 TIP (5.21%), 7 SR (11.6%) Complete Dehiscence: 4 TIP (7.00%), 4 DIG (17.3%), 3 SR (5.00%) Meatal Stenosis: 6 TIP (10.5%), 3 DIG (13.0%) Urethral Stenosis: TIP 3 (5.20%)/DIG 1 (4.30%)/SR 1 (4.60%) Diverticulum: TIP 1 (1.70%)/SR 1 (1.60%)	Clarified the intervention outcomes from co-author and separate population group data from Braga et al 2008
Seo S et al (2016)	Japan	Retrospective Cohort	43	3.2+/- 2.6yrs	Glanular and subcoronal hypospadias	Degloving vs. Plication vs. Corporotomy	i) Deglove+chordectomy (17) ii) Nesbit & UP	i) 100.0% (17) ii) 97.7% (13)	6.4 yrs (range 0.4 - 11.0 yrs)	i) Deglove & Chordectomy: 0 (0.00%) ii)	Urethrocutaneous Fistula: 1 deglove, chordectomy, TAI & TVF	



Supplementary Table 2. Quality assessment for non-randomized comparative studies								
	ROBINS-I study domains							
	Bias due to confounding	Bias in selection of participants into the study	Bias in classification of interventions	Bias due to deviations from intended interventions	Bias due to missing data	Bias in measurement of outcomes	Bias in selection of the reported result	Overall bias
Included studies								
Abosena et al (2020)	Serious	Moderate	Low	Moderate	Moderate	Serious	Moderate	Serious
Badawy et al (2020)	Serious	Moderate	Low	Moderate	Low	Low	Moderate	Serious
Braga et al (2008)	Serious	Low	Low	Moderate	Low	Moderate	Moderate	Serious
Cheng et al (2003)	Serious	Moderate	Moderate	Moderate	Low	Serious	Low	Serious
Gershbaum et al (2002)	Serious	Low	Low	Moderate	Serious	Moderate	Moderate	Serious
Kramer et al (1982)	Serious	Moderate	Low	Moderate	Moderate	Moderate	Moderate	Serious
Pippi et al (2016)	Serious	Moderate	Low	Moderate	Low	Moderate	Moderate	Serious
Seo et al (2016)	Moderate	Moderate	Low	Serious	Low	Low	Moderate	Serious
Snodgrass & Bush (2017)	Serious	Moderate	Low	Moderate	Low	Low	Moderate	Serious
Snodgrass & Bush (2019)	Serious	Moderate	Low	Moderate	Moderate	Moderate	Moderate	Serious
Takeda et al (2018)	Serious	Moderate	Low	Serious	Low	Moderate	Low	Serious
Vandersteen & Husmann (1998)	Serious	Moderate	Low	Moderate	Serious	Moderate	Moderate	Serious