AN AUDIT OF SINGLE STAGE HYPOSPADIAS REPAIR AT AYUB HOSPITAL COMPLEX, ABBOTTABAD

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Background: Single-stage hypospadias repair is increasingly being performed. We report our experience at a general surgical unit. **Methods:** The first one hundred repairs are included in this observational study, set up to evaluate our results. Hypospadias was graded as distal, penile shaft or peno-scrotal, with or without chordee. A single stage procedure of urethral plate elevation, excision of fibrous tissue with preputial onlay flap was used in all patients. **Results:** First 100 operated patients are included in this study. Frequency of major complications was 33%, including fistula (17%), meatal stenosis (7%), premature tube dislodgment (3%), epidermal sloughing and persistent chordee (2% each), and retained tube and torsion penis (1% each). Fistula rate was high (17%). Success in fistula repair was low (53%). In five patients (5%) the urethral plate was transected as it was too short and fibrosed. **Conclusions:** Patients presented early. This procedure may successfully relieve chordee except in peno-scrotal cases. Fistula is a common complication. Early fistula repair may improve outcome. One fourth of the children had a poor cosmetic result. It was not a major concern for parents.

Key words: single stage, Hypospadias repair, complications, cosmesis

INTRODUCTION

'The quest for perfection in hypospadias surgery must continue' [1]

Hypospadias is a common anomaly. The etiology is not known. Various theories have been proposed (like vascular problems, α-reducatase deficiency, androgen/androgen receptors deficiency), and multiple factors may be involved.[2] In women infection and in men cosmesis and function dictate surgery.[3]

Surgery is technically demanding, and the results may be less than satisfactory.[4] Complications include fistula formation, meatal stenosis, stricture and others. Fistula is common. Proximal hypospadias are more commonly associated with chordee and postoperative complications.[5] Failure traditionally meant complications requiring re-operation. The importance of cosmetic outcomes is increasing and some centers of excellence have started reporting cosmetic shortfalls as complications.[6] A staged approach or a single-stage procedure may be used. Many procedures are available and new modifications are evolving which means none is ideal. The quest for an operative procedure with persistently excellent results and minimal complications is still needed.[1]

We are using a single stage repair and we believed our complication rate to be high. We therefore designed this study to evaluate our results and to report our experience.

MATERIAL AND METHODS

This study was conducted at General Surgery Unit B, Ayub Medical College & Hospital Complex, Abbottabad.

Patients undergoing urethral plate elevation and onlay preputial flap repair for Hypospadias from April 1997 to April 2003 were included in this observational study. Children aged 2 ½ years or older were offered surgery. Parents of younger children were advised to wait. Children with suspected inter-sex problems and those where preputial skin was not available, were excluded.

Hypospadias was graded as distal, penile shaft and peno-scrotal. The presence of chordee and quality or urethral plate was noted.

Chordee was categorized as mild, moderate and severe. Chordee was categorized as mild (visible only on erection), moderate (demonstrable without erection), and severe (bent penis bringing tip of glans onto ventral surface).

Table was split in the center, and head was tilted down to improve operative field and reduce blood loss.

Preputial onlay-flap with mobilization of the urethral plate was used. Fibrous tissue anchoring urethral plate to corpora cavernosa was excised. Artificial erection was used to confirm straightening. Tourniquet was not applied; direct pressure was used and haemostasis secured with bipolar cautery.

Anastomosis was performed with 6/0 PDS II on round-bodied needle under antibiotic cover (Cefuroxime). Naso-gastric tube was used as catheter.

Patients stayed on the ward for 7 days. Dressing was changed at 48 hours, and thereafter daily. Follow-up was scheduled one week after discharge (when catheter was removed), and in 6 months.

Cosmetic results were graded as good, satisfactory or unsatisfactory. The overall cosmetic assessment was subjective, although slit-like meatus at end of glans, mucosal collar and bending were considered.[5] Complications were graded as minor and major. Major complications required longer hospital stay or/and secondary surgical procedure, and included fistula, meatal stenosis, premature tube dislodgment, epidermal sloughing, residual chordee, torsion penis and a knotted tube requiring suprapubic removal. Minor complications included chest & wound infections and blood transfusions.

RESULTS

One hundred and ninety-six patients with hypospadias presented to the consultation clinic during this six-year period. One hundred and forty-seven (75%) were advised to come back later. Fourteen patients were operated before the routine 2 ½ years. Seven patients were excluded because foreskin was not available. Seven patients were lost to follow-up and were excluded. Four patients with inter-sex were also not included. One hundred patients were included in the study,

Results are tabulated in tables 1-7.

Out of 17 patients (17%) with fistula, five had meatal narrowing and were put on regular dilatation. None healed - all required re-surgery. Fistula healed in 9 patients. Six patients were operated after a delay of 7 to 9 months and 2 healed. In 11 patients fistula was operated immediately on identification and 7 healed.

Eight patients (8%) had residual chordee - six barely noticeable and 2 moderate. The two with moderate residual chordee had peno-scrotal hypospadias and fibrosed urethral plates.

Seven patients (7%) developing meatal stenosis were recognized after removal of catheter - five also had leak. Meatal stenosis responded to urethral dilatation - fistula did not.

Three patients (3%) had accidental dislodgment of catheter. One tube dislodged on 2nd post operative day was replaced under general anaesthesia. Two tubes were dislodged on 6th and 7th post-op days were replaced on the ward.

Two patients (2%) had bluish discolouration and sloughing of the epidermis. Basal layers were intact. It regenerated.

One retained tube (1%) was removed transvesically. It had a knot inside the bladder!

Minor complications included chest and superficial wound infections and blood transfusions.

Table 1: Age at initial presentation (n=196)

Age at initial presentation		
Age	**No. of patients**	**%**
1-7 days	49	25 %
8 days to 3 months	69	35 %
3 months to 2.5 years	29	15 %
>2.5 years	49	25 %
Total	196	100 %

Table 2: Age at operation (n=100)

Age group	Age	No.	
	19 Months	1	Total
	20 Months	6	14
<2 ½ Years	21 Months	4	
	22 Months	1	
	24 Months	2	
2.5–3 Years		51	51
> 3 Years	3 – 5 Years	16	35
	5 – 10 Years	6	
	11 Years	3	
	13 Years	2	
	16 Years	4	
	17 Years	2	
	18 Years	1	
	24 Years	1	
	Grand Total	100	100

Table 3: Categorization of Hypospadias (n=100)

Hypospadias	*Chordee*				Urethral Plate	
	-	+	++	+++	-	+
Distal n=30	10	13	7	-	10	20

Penile Shaft n=52	23	13	12	4	12	40
Peno-scrotal n=18	1	4	4	9	3 +5*	10
	34	30	23	13	30	70
Total n=100	34	66			30	70

Legend:

Chordee: + mild, ++ moderate, +++ severe.
Urethral Plate: + well developed, - poorly developed

* Urethral plate contributing significantly to the chordee

Table 4: Site of Fistula (n=17)

Site of Fistula	No.	%
Junction of neo-urethra with urethra	12	12/17 = 71%
Complete Disruption	3 + 5*	8/17 = 47%
Corona	2	2/17 = 12%

* in these patients, the fistula started at junction of neo-urethra with the urethra and then proceeded to become complete disruption

Table 5: Major complications (n=63)

Complications	No. (%)	2nd op.	Extra Stay	Resolved	Residual problem
Fistula	17 (17%)	17(100%)	17(100%)	9 (53%)	8 (47%)
Meatal Stenosis	7 (7%)	7 (100%)	7*	7 (100%)	-
Tube dislodgment	3 (3%)	3 (100%)	-	3 (100%)	-
Epidermal sloughing	2 (2%)	- (0%)	2 days	2 (100%)	-
Residual Chordee	2 (2%)	- (0%)	-	-	2**
Knotted tube	1 (1%)	1 (100%)	-	1 (100%)	-
Torsion penis	1 (1%)	- (0%)	-	-	**

Total	33/100 (33%)	27/33*** (82%)	25/33, (76%)	22/33 (67%)	11/33 (33%)

* Multiple procedures without admission

** Parents fully satisfied: did not agree to second medically indicated procedure!

*** Out of 33 major complications, 27 required 2nd surgery, 25 stayed longer, 22 resolved and 11 still need further treatment.\

Table 6: Minor Complications (n=63)

Complications	No. of patients (%)	2nd op./ longer stay	Residual problem
Wound infection	15 (15%)	-	-
Chest Infection	14 (14%)	-	-
Blood transfusion	02 (2%)	-	-
Total	31 (31%)	-	-

Table 7: Cosmetic Results (n=100)

Cosmetic Results	
Good to excellent	50%
Satisfactory	20%
Not satisfactory	30%

DISCUSSION

Hypospadiac children were brought in early. Parents wanted the defect fixed without delay and counseling proved difficult. Desire to get the child circumcised was probably an important factor. We offered surgical repair to all children. We do not agree with Anikwe et al[7] that surgery is not required in distal hypospadias where urination is practiced sitting down.

Elevation of urethral plate, excision of fibrous tissue binding urethral plate to the corpora, and an onlay flap of the inner preputial skin, was selected because it covered a wide range of defects; providing a preferable, fully epithelium-lined tubularised neo-urethra.[8]

Use of urethral plate for hypospadias is not a new concept;[9] Its use in epispadias was reported by Ransley et al,[10] and the concept has since been widely and successfully applied to hypospadias.[11,12,13] Many surgeons prefer two-stage procedures in proximal defects.[14] A single-stage repair with minimal complications may be acceptable to all.[15] Growing number of methods means that none is perfect.[16]

Complications are quite frequent. Still frequency of complications in our study is high when compared to others.

Fistula is the commonest complication. In our study, fistula formed in 17%. It is high but comparable to others.[17] Majority of fistulas occurred at the junction of the neo urethra with the urethra. Surgical methods, material and distal narrowing are important factors.[16] Infection may also contribute. People have used various techniques for closure of fistula, including simple closure as we have attempted.[17,18] Repair feels technically easy, but results are less than promising. Our fistula repair was successful in more than 50%. (Eardley and Whitaker claim around 53% success[16]). We attempted fistula repair 6-9 months later, to allow induration and scarring to subside. We also wanted to see if some fistulas might close spontaneously in response to regular dilatation.[16,19] None of the patients responded to regular dilatation and therefore, towards the end of the study, contrary to advice,[20] we started

performing fistula repair as soon as the fistula was noted. Early results are promising, although the number is too small to comment.

The cause of chordee is tethering of hypoplastic / aplastic corpus spongiosum tissue or urethral plate with the underlying corpora.[12] Mobilising urethra relieves chordee in most of the instances and no further procedure is required to correct chordee. (Up to 30% dorsal plication in some series[1]). We did not need dorsal tucking in any of our primary procedures, but we did transect severely fibrosed urethral plates in 5 patients. Postoperatively two patients had noticeable residual/recurrent chordee. Six patients had mild chordee barely visible only on erection. Failure may be due to inadequate removal of the excessive fibrous tissue or elevating fibrous tissue along with urethral plate which contracts later on. The reason could also be scar contracture as the residual chordee was noted late rather than early. It also could be deformity of the glans giving illusion of chordee. Other authors have discussed this problem and have suggested the use of ventral patches,[14] or transaction of the urethral plate in cases of severe chordee with proximal hypospadias.[21,22] We offered to re-operate on the two patients with noticeable chordee but the parents declined. We did not offer correction for the minor curvatures.[23] Towards the later part of the study, we developed a lower threshold for sacrificing the urethral plate in proximal hypospadias with severe chordee.

We did not use tourniquet. This allowed haemostasis during operation and therefore, reduced post-operative oedema. We used bipolar cautery for meticulous haemostasis and used a loose dressing. Use of a non-compressive dressing reduces post-operative pain and change is less uncomfortable. We did not attempt to measure pain objectively, but none of our patients needed sedation for change of first dressing. Previously (not included in this study), when we were using tourniquet and a compressive dressing, the younger children needed sedation for the first dressing change. Compression dressing is liked and used by many surgeons.[24] Dressing may not be crucial in the eventual surgical outcome,[4,25] but we do believe a loose dressing reduces discomfort.

Major complications occurred in 33% in our study which is comparable to other published series.[26] We were able to resolve most of our complications through secondary procedures. Eight patients (8%), with recurrent fistula remain to be managed. Three patients with major complications requiring surgery refused further treatment (two patients with recurrent chordee and an iatrogenic 30^0 penile torsion) They were discharged from surgical care. Their parents were fully satisfied with the result and were not willing for any further surgical procedure.

Cosmetic results, very noticeably, were not a major concern for the parents. In our study the parents of children with obviously 'unsatisfactory' cosmetic results were 'satisfied' with the outcome! Presence of chordee, rotational deformity, round meatus and other problems were not considered important. This was especially true of patients with proximal hypospadias. We accept that this might not be the case in a different social set up, and we may be seeing some of these patients in future!

CONCLUSION

Hypospadias is common. patients present early and insist on early repair. Surgery is technically challenging. Fistula rate in our study is high and success in fistula repair low. Urethral plate elevation is effective in relieving chordee in the majority of cases, but it may not be effective alone in releasing chordee in proximal hypospadias. Other complications are less frequent and less worrying for the parents. A loose dressing postoperatively may reduce pain and discomfort. Cosmesis may not be a major concern for the parents in some societies: there was no re-operation for cosmetic improvement in our study.

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