

To Compare the Effectiveness of Short Term Anti-erection Measures using Oxybutynin, Phenobarbitone and Ethinyl Estradiol in Reducing Frequent Bladder Spasms, Erections and Post-operative Complications after Hypospadias Repair

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A received anti-erection therapy in post-operative period including Oxybutynin (0.2mg/kg/day), Phenobarbitone (3-5mg/kg/day) and Ethinyl estradiol (0.01mg/day) while Group B consisted of patients who didn't receive anti-erection therapy. Anti-erection measures were given until post-operative day 10 when the urinary catheter was removed. Post-operatively, patients were followed up for complications such as urge to pass urine, preputial edema, extravasation of urine from the neomeatus, pain in the perineum/phallus, urethrocutaneous fistula and wound dehiscence.

Results: The median age was 4.1 years (Group A) and 4.4 years (Group B). Most common type of complications encountered were preputial edema (14/68 patients, 20.59%) and urge to pass urine (14/68 patients, 20.59%) among all patients in both the groups. Post-operative complications viz. Urge to pass urine while catheter in situ (GrA-11.7%, GrB-29.4%), Urinary extravasation (GrA-5.8%, GrB-14.7%), pain in phallus/perineal pain (GrA-8.8%, GrB-20.5%), Urethrocutaneous fistula (GrA-11.7%, GrB-17.6%), preputial edema (GrA-14.7%, GrB-26.4%) and wound dehiscence (GrA-2.9%, GrB-11.7%) were frequent among group B patients who haven't received anti-erection therapy but correlations for urge to pass urine and pain in phallus/perineal pain found to be statistically significant (<0.05).

Discussion: The study demonstrates that anti-erection treatment reduces bladder spasm and erection, subsequently reducing post-operative complications significantly.

Conclusion: Our study demonstrates that short-term therapy with Oxybutynin, phenobarbitone and ethinyl estradiol is an effective and safe method for decreasing the frequency of bladder spasms, frequent erections and ultimately complications after urethroplasty.

Keywords: Hypospadias; Anti erection treatment; Oxybutynin; Phenobarbitone; Ethinyl estradiol.

Abstract

Introduction: Bladder spasms and penile erections are common problems after urethroplasty and may affect surgical outcomes. Bladder spasms may also induce erections and manifest as intermittent abdominal cramps, perineal pain, urgency to void or may result in urinary leakage and fistula. Our study aimed to analyse the efficacy of anti-erection treatment during postoperative period after urethroplasty.

Objective: To compare the effectiveness of short term anti-erection measures using Oxybutynin, phenobarbitone and ethinyl estradiol in reducing frequent bladder spasms, erections and postoperative complications after hypospadias repair.

Study design: A retrospective study was conducted in which case records of 68 patients who had undergone repair for distal and mid-penile hypospadias by the Snodgrass technique over 2 years (2017-2019) were reviewed. Patients were divided in two groups with 34 patients in each group. Patients in Group

INTRODUCTION

Hypospadias is one of the common anomalies in boys occurring in approximately 1 in 250 male newborns.¹ Majority of cases can be treated in single stage, but some cases require staged procedures.² Bladder spasms and penile erections are among the common problems after urethroplasty which may be detrimental to surgical repair. Bladder spasms may also induce erections and manifest as intermittent abdominal cramps, perineal pain, urgency to void or may result in urinary leakage around the urethral catheter.³ These factors affect the recovery of patients in post-operative period and may increase the chances of infection, urethrocutaneous fistula, wound dehiscence or failed repair. Previous studies have been done showing the role of Solefenacin in reducing the bladder spasms after urethroplasty but no study has been done showing the efficacy of anti erection measures after urethroplasty. In our study we studied the efficacy of anti erection measures involving Oxybutynin, an anti-cholinergic agent used to reduce bladder spasm/overactivity, Phenobarbitone, a barbiturate agent used as sedative and Ethinyl estradiol, an estrogen used to prevent penile erections. We compared two groups of Snodgrass urethroplasty with one group received anti-erection measures and other group didn't receive anti-erection therapy.

MATERIAL AND METHODS

It is a retrospective study where we collected, analyzed and followed up the data of 68 patients who had undergone hypospadias repair by Snodgrass Tubularized incised plate (TIP) urethroplasty

technique over the duration for 2 years (2017-2019). Study was undertaken after obtaining clearance from institutional ethical committee and all subjects provided written informed. Distal penile and mid-penile hypospadias were included. Patients were divided in two groups with 34 patients in each group. Patients in Group A underwent primary single stage urethroplasty by Tubularized incised plate (TIP) urethroplasty technique and received anti-erection therapy in post-operative period including Oxybutynin (0.2mg/kg/day), an anti-cholinergic agent used to reduce bladder spasm/overactivity, Phenobarbitone (3-5mg/kg/day), a barbiturate agent used as sedative and Ethinyl estradiol (0.01mg/day), an estrogen used to prevent penile erections, while Group B consisted of patients who underwent primary repair but without having received anti-erection therapy. Anti-erection measures were given up to night before the catheter removal (up to post-operative day 10). Patients were followed up in post-operative period and data collected for any complications like urge to pass urine, preputial edema, extravasation of urine from neomeatus, pain in perineum/pain in phallus, urethrocutaneous fistula, and wound dehiscence. Both groups are compared, and p-value was calculated. P-value less than 0.05 considered as statistically significant.

RESULTS

Patients were divided in two groups based upon the anti-erection measures received viz. Oxybutynin, Phenobarbitone and Ethinyl estradiol. Each group had 34 patients each. Patients in both the group were comparable in terms of demographic and

Table 1: Description and post-operative complications in patients enrolled in the study

		Group A (34)	Group B (34)	P value
Mean age (yrs.)		4.1	4.4	
Variety	Distal Penile	23(67.6%)	21(61.7%)	
	Mid-Penile	11(32.4%)	13(38.3%)	
Complications				
Urge to pass urine		4(11.7%)	10(29.4%)	0.012
Extravasation of urine from neomeatus		2(5.8%)	5(14.7%)	0.083
Perineal pain/Pain in phallus		3(8.8%)	7(20.5%)	0.043
Urethrocutaneous Fistula		4(11.7%)	6(17.6%)	0.324
Preputial edema		5(14.7%)	9(26.4%)	0.103
Wound dehiscence		1(2.9%)	4(11.7%)	0.083

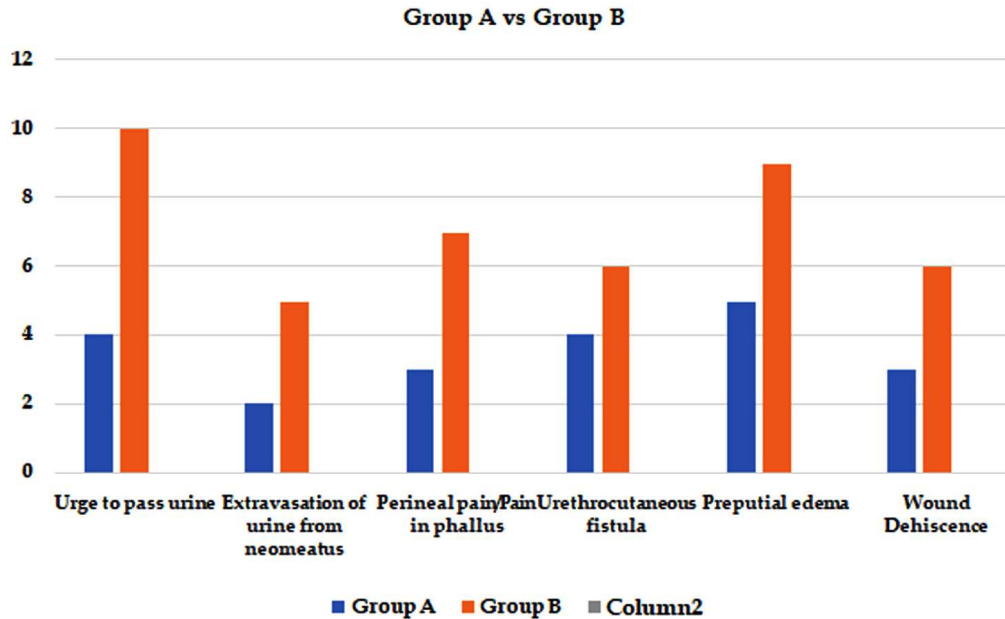


Fig. 1: Bar graph depicting post-operative complications in enrolled patients (Group A and Group B)

clinical characteristics. Results of each group is summarised in table 1, figure 1.

The median age was 4.1 years (Group A) and 4.4 years (Group B). Most common type of complications encountered were preputial edema (14/68 patients, 20.59%) and urge to pass urine (14/68 patients, 20.59%) among all patients in both the groups. Urge to pass urine with catheter in situ was seen in 4 (11.7%) patients in group A and 10 (29.4%) patients in Group B ($p=0.012$, <0.05). Extravasation of urine from neomeatus while catheter in place was seen in 2 (5.8%) and 5 (14.7%) patients in Group A and B respectively ($p=0.083$, >0.05). Where only 3 (8.8%) patients in group A experienced perineal pain or pain in phallus, almost 7 (20.5%) patients in Group B had same complaints ($p=0.043$, <0.05). 4 (11.7%) patients in Group A and 6 (17.6%) patients in Group B developed Urethrocutaneous fistula ($p=0.324$, >0.05). Preputial edema was present in 5 (14.7%) patients in Group A while it was seen among 9 (26.4%) patients in group B ($p=0.103$, >0.05). Wound dehiscence including all layers was seen only in 1 (2.9%) patient in group A while it was observed in 4 (11.7%) patients in group B ($p=0.083$, >0.05).

DISCUSSION

Patients undergoing surgeries involving lower urinary tract like urethroplasty with catheter inserted are more prone for bladder spasms and penile erection that may jeopardise the outcome of

the surgery.⁴ The occurrence of bladder spasms and frequent erections in post-operative period also impact the recovery of patients. Bladder spasms may also induce penile erections and manifest as intermittent abdominal cramps, perineal pain, urgency to void or may result in urinary leakage/fistula. In the setting of frequent bladder spasms and erections, the best treatment is to remove the catheter that might have been causing irritation of bladder trigone⁵ but after procedures like urethroplasty when it is essential keep the catheter for at least 10-12 days, we have to look for the other necessary anti-erection measures. The current treatment described in reducing bladder spasms include opioids, anticholinergics, bladder smooth muscle relaxants, and local anesthetics.⁶ Previous studies have been done showing the role of Solifenacin in reducing the bladder spasms after urethroplasty but no study has been done showing the efficacy of anti-erection measures after urethroplasty. Study by Peng XF et al.⁷ shows a statistically significant difference in the severity of bladder spasms, the mean duration of spasms, the incidence of urine extravasation, and incidence of radiating pain after adding anti-cholinergic agent solifenacin in post-urethroplasty patients. Previous studies by Chapple et al.⁸ and Luo et al.⁹ shows the efficacy of solifenacin for treating overactive bladder reported that it had beneficial effects on the micturition frequency and nocturia after lower urinary tract surgeries.

In our study, anti-erection treatment was given in post-operative period up to the night before

catheter removal (usually post-operative day 10) and consisted of Oxybutynin (0.2mg/kg/day), Phenobarbitone (3-5mg/kg/day) and Ethinyl estradiol (0.01mg/day). Oxybutynin is an anticholinergic medication that has antispasmodic activity against bladder smooth muscle. Active metabolite blocks the muscarinic effect of acetylcholine on postganglionic muscarinic receptors M 1, 2 & 3. This causes bladder smooth muscle relaxation and reduces bladder spasm/overactivity, decreased urinary urgency, frequency and delay the initial desire to void.¹⁰ Estradiol acts at the level of the brain to influence erectile function and reduces erections. Estradiol inhibits the hypothalamus-pituitary axis and subsequently FSH and LH, thus reducing circulating testosterone.¹¹ Phenobarbital is a barbiturate, nonselective central nervous system depressant which is used as a sedative. This sedative has short half life time and a short duration depending on the dose.

In our study, we analysed that anti-erection treatment has significant impact upon reducing bladder spasm symptoms, frequent erections and subsequently complications. Urgency to void and perineal pain/pain in phallus significantly reduced in patients who received anti-erection measures ($p < 0.05$). Uninhibited bladder spasms or erections may jeopardise the post-operative recovery and results. As we have seen extravasation of urine, preputial edema, wound dehiscence and fistula complications also reduced in significant percentage of patients who received anti-erection treatment in post-operative period.

Side effects from the different agents have also been noted, including a decrease in gastrointestinal motility (leading to nausea and constipation), dry mouth induced by oxybutynin, and the risk for misplacement of the cannula during epidural anesthesia.⁴ With regard to safety, in the study group no patient developed drug related complications since the medications were given for small period in post-operative setting. Therefore, it can be concluded that patients undergoing urethroplasty can safely be started on anti-erection measures with Oxybutynin, phenobarbitone and ethinyl estradiol as these short term medications found to be effective in reducing post urethroplasty complications related to frequent bladder spasms and erections.

LIMITATIONS

This study also has some limitations including small sample size. Large sample size, well-

designed studies need to be conducted for optimal comparisons.

CONCLUSION

Although there could be lots of factors that might affect the outcome of hypospadias surgery but commonly occurring catheter related complications like frequent bladder spasms and penile erections that may completely jeopardise the result of hypospadias surgery, can be avoided or minimised by complying with anti-erection measures. Our study demonstrated that short-term therapy with Oxybutynin, phenobarbitone and ethinyl estradiol is an effective and safe method for decreasing the frequency of bladder spasms and frequent erections and ultimately complications after urethroplasty.

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REFERENCES

1. Duckett JW. Successful hypospadias repair. *Contemp Urol*. 1992;4:42-55.
2. Haxhiresha KN, Castagnetti M, Rigamonti W, Manzoni GA. Two-stage repair in hypospadias. *Indian J Urol*. 2008;24(2):226-232. doi:10.4103/0970-1591.40620.
3. Chiang, D., Ben-Meir, D., Pout, K., Dewan, P. A. (2005). Management of post-operative bladder spasm. *Journal of Paediatrics and Child Health*, 41(1-2), 56-58.
4. Yates, V., Tanner, J., Crossley, A. (2004). Bladder spasm following transurethral surgery. *British Journal of Perioperative Nursing*, 14(6), 259-260, 262-254.
5. Anderson, P. D., Dewan, P. A. (2002). Catheter-less Cohen transtrigonal ureteric reimplantation. *BJU International*, 89(7), 722-725.
6. Park, J. M., Houck, C. S., Sethna, N. F., Sullivan, L. J., Atala, A., Borer, J. G, Bauer, S. B. (2000). Ketorolac suppresses postoperative bladder spasms after pediatric ureteral reimplantation. *Anesthesia and Analgesia*, 91(1), 11-15.
7. Peng XF, Lv XG, Xie H, et al. Effectiveness of Solifenacin for Managing of Bladder Spasms in Patients With Urethroplasty. *American Journal of Men's Health*. September 2017:1580-1587.
8. Chapple CR, Rechberger T, Al-Shukri S, Meffan P, Everaert K, Huang M, Ridder A; YM-905 Study Group. Randomized, double-blind placebo- and tolterodine-controlled trial of the once-daily antimuscarinic agent solifenacin in patients with symptomatic overactive bladder. *BJU*

- Int. 2004 Feb;93(3):303-10. doi: 10.1111/j.1464-410x.2004.04606.x. PMID: 14764127.
9. Luo D., Liu L., Han P., Wei Q., Shen H. (2012). Solifenacin for overactive bladder: A systematic review and meta-analysis. *International Urogynecology Journal*, 23(8), 983-991. doi:10.1007/s00192-011-1641-7.
 10. Hur M, Park SK, Yoon HK, Yoo S, Lee HC, Kim WH, Kim JT, Ku JH, Bahk JH. Comparative effectiveness of interventions for managing postoperative catheter-related bladder discomfort: a systematic review and network meta-analysis. *J Anesth*. 2019 Apr;33(2):197-208.
 11. Xu ZH, Xu XH, Pan D, et al. Effect of estradiol on penile erection: a cross-sectional study. *Transl Androl Urol*. 2019;8(6):574-582. doi:10.21037/tau.2019.10.15.

