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ORIGINAL ARTICLE

Comparative Study of Captopril Gel Assisted Clean Intermittent Self-Catheterization Versus Xylocaine Gel in Preventing Recurrence of Urethral Stricture Following Direct Vision Internal Urethrotomy

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ABSTRACT

Background: Direct vision internal Urethrotomy (DVIU) is normally performed technique for the dealing with urethral strictures. Clean discontinuous self-catheterization (CISC) is performed to defeat repeat after DVIU alongside a few antifibrotic specialists to defer the fibrotic procedure.
Aim: To compare the effectiveness of captopril gel assisted clean intermittent self-catheterization versus xylocaine gel in preventing recurrence of urethral stricture following direct vision internal urethrotomy.
Setting: 84 patients were incorporated into this randomized controlled preliminary at Department of urology, Mayo Hospital, Lahore for a half year.
Methods: Patients were haphazardly separated into two gatherings, each gathering containing 42 patients as Group A (CISC with xylocaine gel) and Group B (CISC with xylocaine gel + captopril gel). All patients experienced direct visual inside urethrotomy (DVIU). Following DVIU, the patients performed clean irregular self-catheterization (CISC) according to convention of gathering An and B with 16 french nelaton catheter. The routine was decreased over a 3 months' time frame. Tolerant were for repeat of stricture toward the finish of first, second and third months.
Results: Mean length of urethral stricture in Group A was 1.27+ 0.12 and 1. + 0.73 in Group B. Group B had higher success rate in preventing recurrence of urethral stricture with 73.8% patient did not have precedence of stricture as compared to Group A where 42.9% patient had no recurrence. (p value 0.004).
Conclusion: Captopril gel assisted clean intermittent self-catheterization is superior to xylocaine gel alone in avoiding recurrence of urethral stricture following direct vision internal Urethrotomy.
Keywords: Urethral stricture, clean intermittent self-catheterization (CISC), Direct Visual internal Urethrotomy (DVIU)

INTRODUCTION

Male urethral strictures speak to around five thousands inpatient visits and one point five million office visits for consistently in the USA. The pace of urethral stricture has been assessed at two hindered to twelve hindered cases for each lac individuals, with the rate mightily growing in people developed less than equal to fifty five years. Related costs to the helpful structure are significant; the surveyed yearly social protection utilizations for male urethral stricture infection in the USA were US$ one ninety one million of each two thousand, with a yearly human administrations use addition of US$ six thousand seven fifty nine for a shielded male with stricture malady[1].

Strictures can be apportioned into two essential sorts, principal and back, which differentiate in their general vicinity, yet what's more in their fundamental pathogenesis. In an audit assessment of all strictures that had been changed at a lone foundation, by a long shot a large portion of strictures were preeminent (92.2%), with most of these event in the bulbar urethra (46.5%), trailed by penile (35.5%), penile and bulbar (9.9%), and pan-urethral (4.9%) strictures[2].

Changes in the extracellular matrix of urethral spongiosal tissue have been seen in histological evaluation of normal and strictured urethral tissue in all cases[3]. A reduction in the amount of type III collagen to type I collagen is observed in the thick strands mixed with fibroblasts[5]. Nitric oxide's relationship with strictured urethral tissue has undergone enormous shifts, and this shift is accompanied by a shrinking of smooth muscle to collagen[6].

Anterior urethral strictures typically happen following injury or pollution, achieving spongiofibrosis. Through this methodology, the corpus spongiosum advances toward turning out to be fibrosed, making a constrained urethral lumen. Iatrogenic causes have been seemed to speak to for all intents and purposes half of idiopathic strictures, which relates to about 30% everything being equivalent[7]. concerning penile urethral strictures, about 15% are idiopathic, 40% are iatrogenic, 40% are combustible, and 5% are related to injury. For bulbar urethral strictures, about 40% are idiopathic, 35% are iatrogenic, 10% are provocative, and 15% are repulsive[8].

Both preoperative and intraoperative ultrasounds can be conducted. This approach in like manner assesses the stricture at the period of fix and, right now, the most outrageous earnestness of the stricture. Not only are these imaging modalities essential for determining stricture characteristics, but also for ensuring that each weak section of the urethra is incorporated into the repair. Notwithstanding the high frustration pace of direct vision inside urethrotomy, it remains the most conventionally performed framework for the treatment of urethral strictures[9]. Catheter is left for three to five days pursued by clean discontinuous self-catheterization for three to six months, beginning multiple times every day decreasing to a few times for each week toward the finish of period. Clean discontinuous self-catheterization is integral method purposed to beat repeat after Direct vision internal Urethrotomy. It is the inclusion and expulsion of a catheter a few times each day to purge the bladder after Direct vision internal Urethrotomy[10].

A few antifibrotic operators have been utilized not withstanding clean discontinuous self-catheterization to defer the fibrotic processand consequently diminish repeat rate. Captopril is an angiotensin changing over compound inhibitor (ACE – I) with antifibrotic properties. Captopril restrains the fibrotic procedure by obstructing the EGF[11]. Changing development factor-beta (TGF-b) is additionally a key fibrogenic cytokine that has been appeared to animate fibroblast multiplication and extracellular framework affidavit. It is demonstrated that angiotensin changing over protein (ACE) inhibitors down controls TGF-b. This critical component ought to be borne as a top priority as the significant system for captopril-prompted restraint of urethral stricture[12]. It is protected, non-lethal and antifibrotic. Sherazi et al distributed in two thousand seven considered impacts of intraurethral captopril gel on repeat of

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urethral stricture after Direct vision internal Urethrotomy and found that repeat rate was 30% with utilization of 0.1% captopril gel when contrasted with 52.6% in fake treatment[13]. In an investigation by Rasool et al distributed in two thousand sixteen, repeat rate after direct vision inward urethrotomy with clean irregular self-catheterization was twenty 1.6% contrasted and forty eight point 3% in patients with direct vision inside urethrotomy without clean discontinuous self-catheterization[14].

MATERIALS AND METHODS

Randomized controlled trial conducted in the Department of Urology, Mayo Hospital, Lahore. six months after approval of synopsis by hospital ethical committee. Sample size of eighty four patients (42%) patients in each group) was estimated by using 5% level of significance, 90% power of test with expected percentage placebo group as 80% and captopril gel 0.1% as 50%[13]. Probability sampling technique for patient selection and simple random sampling for group distribution.

Patients of age sixteen and above, stricture size one to one point five cm, spongiofibrosis (minimal/ moderate/ extensive), stricture with any one of the following cause idiopathic strictures, infective strictures, traumatic strictures , previously operated (IOU once) and anterior urethral stricture were included. Informed consent was obtained from each patient in the study. All the patients underwent urethral ultrasonography, retrograde urethrogram, urine complete examination and urine culture/ sensitivity for any infection indicated in urine complete exam report. Patients were randomly divided into two groups, each group containing forty two patients as: Group A (Control Group): CISC with xylocaine gel and Group B (Test Group): CISC with xylocaine gel + captopril gel.

Point one percent Captopril gel (hundered mg in hundered gm- W/W) and xylocaine gel were packed in similar tubes. IOU was performed by incising the stricture. Technique was same in all patients. Following IOU, the patients were trained and educated to perform CISC with sixteen F nelaton catheter. About five milliliter of captopril gel was applied on nelaton catheter and gel was retained in urethra for five minutes after CISC. The regimen was tapered over a three months period. The patients were followed regularly after the IOU on first, second and third months postoperatively[13] first Week: Twice a day, second Week: Once a day, 3rd Week: Every other day, forth Week: Twice a week, secondnd Month: Once a week, third Month: Alternate weeks, Patient were assessed by taking history of urinary symptoms and patency of urethra was confirmed by sixteen Fr nelaton catheter, urethral ultrasound and retrograde urethrogram at the end of first, second and third months. In case of recurrence, patients were excluded from the study and followed for further intervention as a regular patient. Data was entered SPSS-twenty. Quantitative variables like age and stricture size were presented as mean + SD. Qualitative variables like etiology was presented as frequency and percentages. Comparison of two groups placebo group and captopril gel 0.1% group was done by independent sample t-test. P- value less than point zero five was taken as significant.

RESULTS

Mean age of the patient in Group A was 45.48+7.2 years whereas it was 44.64+7.6 years in Group B. Most of patients in both groups were of age 41-50-year group, 26 in Group A while 24 in Group B. Both groups were similar in age distribution with P value 0.603 (Table 1).

Mean length of urethral stricture in Group A was 1.27 + 0.12 and 1.24 + 0.73 in Group B. Most of patients had length of urethral stricture of about 1.2-1.3 cm (Table 2). Overall, Iatrogenic stricture (26.2%) and trauma (20%) were most common etiologies, followed by idiopathic, previously operated and infection (17.9%) were most common other etiologies. (Table 3) Both groups were comparable in terms of Stage of Urethral Stricture (P Value 0.775) and Grading of Spongiofibrosis (P Value 0.603). (Table 4 and 5)

Group B had higher success rate in preventing recurrence of urethral stricture with 73.8% patient did not have precedence of stricture as compared to Group A where 42.9% patient had no recurrence. The difference was statistically significant with p value 0.004. (Graph 1) Recurrence of urethral stricture in Group A was mostly in 3rd month (31.0%) while recurrence in Group B was almost equally distributed in 1st, 2nd and 3rd month (Table 6).

Table 1: Details of the various Age groups of the Patients

Age (Years)	Group A		Group B	
	Frequency	%age	Frequency	%age
21-30	2	4.8	1	2.3
31-40	5	11.9	7	16.7
41-50	26	52.0	24	48.0
51-60	9	21.4	10	23.8

Chi square test applied: P Value 0.63

Table 2: Details of the Length of Urethral Stricture

Length(CM)	Group A		Group B	
	Frequency	%age	Frequency	%age
1.0	1	2.4	0	0.0
1.1	4	9.5	3	7.1
1.2	13	37.1	22	62.9
1.3	14	33.3	14	33.3
1.4	6	14.3	3	7.1
1.5	4	9.5	0	0.0

Chi square test applied P Value 0.095

Table 3: Etiology of Urethral Stricture

Etiology	Group A	Group B	Total
Idiopathic strictures	8(9.5%)	7(8.3%)	15(17.9%)
Previously operated	6(7.1%)	9(10.7%)	15(17.9%)
Infective strictures	6(7.1%)	9(7.1%)	15(17.9%)
Traumatic strictures	11(13.1%)	6(7.1%)	17(20%)
Iatrogenic stricture	11(13.1%)	11(13.1%)	22(26.2%)
P Value	0.603		

Table 4 Stage of Urethral Stricture

Stage	Group A		Group B	
	Frequency	%age	Frequency	%age
Mild	13	31.0	15	35.7
Moderate	14	33.3	15	35.7
Severe	15	35.7	12	28.6
Total	42	100.0	42	100.0
P value	0.775			

Table 5 Grading of Spongiofibrosis

Grading of Spongiofibrosis	Group A		Group B	
	Frequency	%age	Frequency	%age
Minimal	12	28.6	16	38.1
Moderate	17	40.5	16	38.1
Extensive	13	31.0	10	23.8
Total	42	100.0	42	100.0
P value	0.603			

Table 6: Time of recurrence of urethral stricture

Recurrence	Group A	Group B	Total
1st Month	2(4.8%)	3(7.1%)	5(6%)
2nd Month	9(21.4%)	4(9.5%)	13(15.5%)
3rd Month	13(31%)	4(9.5%)	17(20%)
Total Recurrence	24(57.1%)	11(26.2%)	35(41.7%)
No Recurrence	18(42.9%)	31(73.8%)	49(58.3%)
Total	42(100%)	42(100%)	84(100%)
P value	0.024		

DISCUSSION

Urethral strictures are a typical wellspring of referrals to urologists. In our investigation, Overall, Iatrogenic wounds (26.2%) were most basic etiology. Different etiologies incorporate idiopathic stricture medical procedures and contamination. Our discoveries are steady with Fenton et al[15] and Singh et al[16] where iatrogenic wounds were

additionally commonest cause. The treatment of urethral strictures remains a testing field in urology despite the fact that there is an assortment of techniques to treat it at present, as nobody approach is better over another[17].

Over the span of therapeutic history, the treatment of urethral stricture stretched out from catheterization and expansion of interlopers to additional cutting-edge techniques, for instance, amplification, surprise inside urethrotomy and open redoing of the urethra. With the rising of endoscopic rigging, the chief report of DVIU was seen in 1865 and has been the best degree of infection edge urethrotomy since 1971[18].

Direct Visual Internal Urethrotomy (DVIU) was the cautious technique used in our examination. All things considered rehash of urethral stricture after DVIU was 41.67% in our assessment. The long-term and short-term eventual outcomes of DVIU have been evaluated and the accomplishment rate uncovered as 23–83% in a couple articles[19].

In the forefront time, moved systems, for instance, urethrotomy with neodymium:yttrium–aluminum–garnet (Nd:YAG), holmium and argon lasers have been introduced. These techniques are protected with a low ensnarement rate and extraordinary vision, yet monotonous (run, 45–75 min). Vicente et al. differentiated laser urethrotomy and standard infection sharp edge urethrotomy and itemized a 73% and 80% accomplishment rate in one year and 73% and 60% in two years, independently. It was assumed that laser urethrotomy isn't better than cold sharp edge in short-term results and greater association with longer follow up is required[20].

In our investigation, clean self-intermittent catheterization was exhorted following DVIU to defer the stricture repeat. Beforehand extraordinary techniques have been utilized for diminishing the repeat rate after DVIU, for example, self-intermittent catheterization. Despite the fact that this technique is straightforward, it ought to be proceeded for a long length of time, perhaps for all time. The short-term consequences of this technique were not distinctive to the perception amass in the Bodker think about[21].

Notwithstanding perfect self-discontinuous catheterization, distinctive calming operators have been utilized to postpone the procedure of swelling and hence avoid repeat of stricture. Antifibrotic drugs (for example pirfenidone, D-penicillamine, L-Arginine, cancer prevention agents) have been utilized in various organs, including the lung, kidney, liver and heart among others[22].

Angiotensin II expands collagen type I union, fiery and pole cell collection, fibroblast development, multiplication and accumulation also having the capacity to diminish collagenase action. The antifibrotic impact of ACE-I is fundamentally because of restraint of changing development factor (TGF)-β1 and the ensuing systems of activity referenced previously[23]. Huang et al. discovered decreased collagenase, TIMP1, and collagen type I in urethral scar tissue[24]. Captopril, an ACEI, can decrease organ fibrosis by changing movement patterns. Captopril gel from hydrophilic cellulose has limited adverse effects. It's use causes cardiac putrefaction and hypertension[25].

As a drug with a strong antifibrotic capacity in exchange organs and low rates of basic and neighbourhood side effects without fatality, captopril was selected for clinical testing. Scarcely any investigations have been completed about the impact of antifibrotics on the repeat of US after DVIU. In our investigation, captopril averted repeat in 73.8% of patients when contrasted with 42.9% in control gathering.

Shirazi et al has demonstrated that repeat of urethral stricture was 52.6% in fake treatment gel gathering, 30% in Captopril 0.1% gel gathering and 35.3% in Captopril 0.5% gel gathering. It was not factually extraordinary between Captopril 0.1% gel and Captopril 0.5% gel (P=0.21), yet was less in the two gatherings than Placebo gel aggregate I (P<0.05)[13].

CONCLUSION

Captopril gel assisted clean intermittent self-catheterization is better than xylocaine gel alone in preventing urethral reappearance stricture following direct vision inner Urethrotomy.

Conflict of interest: Nil

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