OUTCOME BETWEEN INTRALESIONAL INJECTION OF TRIAMCINOLONE FOLLOWING OPTICAL INTERNAL URETHROTOMY (OIU) AND OIU ALONE FOR THE MANAGEMENT OF SHORT SEGMENT STRICTURE OF MALE URETHRA

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Abstract
Objective: To compare the outcome of optical internal urethrotomy (OIU) with or without intralesional triamcinolone acetonide injection for the treatment of short segment anterior urethral stricture.

Methods: This prospective quasi experimental study was carried out in the department of Urology, DMCH, Dhaka from November 2015 to April 2017 on 50 patients with short segment of anterior urethral stricture. Cases were randomly allocated to group A (OIU without Triamcinolone) and group B (OIU with Triamcinolone). Each group consisted of 25 patients. Data were analyzed and compared by statistical tests.

Results: There were no significant differences in the baseline characteristics of the patients. Recurrences of stricture urethra were higher among those without Triamcinolone than cases with Triamcinolone which was statistically significant (p=0.033) at 6 month and (p=0.016) at 9 months. Regarding mean time interval in month of development of recurrence of stricture was 6.1±1.66 months in Group A and 7.66±1.52 months in Group B which was statistically significant (p=0.001)

Conclusion: OIU with intralesional triamcinolone is better than OIU alone. It significantly reduced and delayed the recurrence of anterior urethral stricture.

Key words: Urethral stricture, LUTS, OIU.

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Introduction:
Urethral stricture is fibrotic narrowing of urethral lumen. This narrowing restricts urine flow¹. A patient with urethral stricture presents with obstructive & irritative voiding symptoms including frequency, urgency and occasionally dysuria². Stricture disease can have a profound impact on quality of life resulting in infection, bladder calculi, fistulas, sepsis and ultimately renal failure. Studies of stricture disease in untreated patients show high rates of complications³. Many different treatment modalities are available such as dilatation, urethrotomy & urethroplasty. OIU is simple, safe & minimum inconvenience to the patient and requires a short time of work procedure⁴. In clinical practice OIU is an easy procedure and

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is offered as a first-time treatment, but the long-term results are inferior to urethroplasty.\textsuperscript{5} If wound contraction significantly narrows the lumen before the completion of epithelialization, the stricture recurs. Several techniques have been used to oppose the process of wound contraction and to prevent stricture recurrence such as indwelling foley catheter, clean intermittent self-catheterization. Injection of steroids at the site of urethrotomy prevents scar formation by inhibiting collagen synthesis, increase endogenous collagenase production and reduces levels of collagenase inhibitors.\textsuperscript{6} The aim of study was to compare the outcome of OIU with or without intralesional triamcinolone acetonide injection for the treatment of short segment anterior urethral stricture.

**Methods:**
This prospective study was carried out among the patients with urethral stricture planned for OIU in the department of Urology, Dhaka Medical College Hospital, Dhaka, from November 2015 to April 2017. The selection criteria were age 18 - 65 years, male, length of stricture up to 1.5 cm, maximum flow rate on uroflowmetry<15 ml/sec. Patients having multiple stricture, neurogenic bladder, BXO with anterior urethra stricture, previous intervention for urethral stricture, per operative complications- bleeding, extravasations of urine were excluded. Total 50 patients were selected by statistical formula & randomly allocated to 2 groups. Group A consisted of 25 patients who underwent OIU without inj. Triamcinolone. Group B- 25 patients who underwent OIU with inj. Triamcinolone. Odd-numbered cases were allocated for Group A & even-numbered cases were allocated for Group B. Written informed consent was taken from every case. Each study subject was evaluated by history, physical examination and investigation. All patients were investigated by Urine profile & culture sensitivity, Serum creatinine, Ultrasonogram of KUB with MCC & PVR. Uroflowmetry, RGU & MCU-determination of site & length of stricture. Standard operative procedure was followed in every case. OIU was done at 12 o'clock position using cold knife. Only fibrotic tissue was cut, and normal healthy urethra was remaining intact. The incision was continued until a 21 Fr optical sheath would pass through the stricture site into the bladder and thorough cystoscopy was done. After OIU triamcinolone inj. was given. On the other hand, OIU was done for the control Group. After the procedure bladder catheterized with 18 fr Foley for 5 days. After the procedure patients were followed up regularly at 3, 6 & 9 months of postoperative period. The treatment would report successful if they wouldn’t complain any voiding symptoms & had a peak flow rate>15 ml/sec. The need for secondary procedure like dilatation, internal urethrotomy, and urethroplasty will be considered as treatment failure.

**Results:**
Total 50 patients of urethral stricture were allocated to group A (OIU) & group B (OIU with triamcinolone inj.). Among them mean age was 35.6 & 37.04 years for group A & group B respectively (Table I).

Q max in both groups-A & groups-B. Q max during pre-operative and post-operative period was statistically not significant in between the groups but Pre-post-operative Q max in same group was statistically significant (Table II).

### Table I
*Mean age of study subjects, (n=25).*

| Age (mean ± SD) | Group A (OIU without Triamcinolone) | Group B (OIU with Triamcinolone) | p value |
|----------------|-------------------------------------|----------------------------------|--------|
| Mean ± SD      | 35.6 ± 13.05                        | 37.04 ± 13.04                    | 0.698  |

### Table II
*Comparison of Q max between two groups (ml/sec) [n=25].*

| Groups | Pre-operative Q max (mean ± SD) | Post-operative Q max (Mean ± SD) | p value |
|--------|---------------------------------|---------------------------------|--------|
| Group A| 12.23 ± 2.5                    | 19.58 ± 2.10                    | 0.001  |
| Group B| 13.12 ± 2.14                   | 20.98 ± 2.54                    | 0.001  |
| p value| 0.18                            | 0.23                            |        |
Both Group-A & Group-B voiding time during pre-operative and Post-operative period was not statistically significant and pre-post-operative voiding time was statistically significant (Table III).

Comparison of post-operative bleeding, extravasations of urine and infection between two groups: Values in the parentheses denote corresponding percentage (%). Shows the comparison of post-operative bleeding, extravasations of urine and infection between Group-A and Group-B which was not statistically significant (Table IV).

Post-operative recurrence of stricture was significantly higher among those without triamcinolone than subjects with triamcinolone (Table V).

Post-operative time interval (months) of development of recurrence of stricture were significantly more in group B than group A (Table VI).

### Table III

**Comparison of voiding time between two groups in second. (n=25).**

| Groups       | Pre-operative voiding time (Mean ± SD) | Post-operative voiding time (Mean ± SD) | p value |
|--------------|----------------------------------------|----------------------------------------|---------|
| Group A      | 85.50 ± 2.65                           | 29.40 ± 2.40                           | 0.001   |
| Group B      | 86.35 ± 3.5                            | 30.38 ± 3.25                           | 0.001   |
| p value      | 0.30                                   | 0.23                                   |         |

### Table IV

**Comparison of post-operative bleeding, extravasations of urine & infection (n=25)**

| Complications                  | Group A (OIU without Triamcinolone) | Group B (OIU with Triamcinolone) | p value |
|--------------------------------|-------------------------------------|----------------------------------|---------|
|                                | Present (%) | Absent (%) | Present (%) | Absent (%) |         |
| Bleeding                       | 1(4)        | 24(96)     | 2(8)        | 23(92)     | 1.00    |
| Extravasations of urine        | 1(4)        | 24(96)     | 0(0)        | 25(100)    | 1.00    |
| Infection                      | 1(4)        | 24(96)     | 1(4)        | 24(96)     | 1.00    |

### Table V

**Comparison of rate of recurrence with follow up time (n=25).**

| Groups             | 3 month | 6 month | 9 month | p value |
|--------------------|---------|---------|---------|---------|
|                     | Present (%) | Absent (%) | Present (%) | Absent (%) |         |
| Group A            | 1 (4)   | 24 (96) | 8 (32)  | 17 (68)  | 10 (40) | 15 (60) | 0.001<sup>a</sup> |
| Group B            | 1 (4)   | 24 (96) | 2 (8)   | 23 (92)  | 3 (12)  | 22 (88) |             |
| p value            | 0.297<sup>b</sup> | 0.033<sup>b</sup> | 0.016<sup>b</sup> |         |

### Table VI

**Comparison of mean time interval (month) of development of recurrence of stricture (n=25).**

| Time interval (month) | Group A (OIU without Triamcinolone) | Group B (OIU with Triamcinolone) | p value |
|-----------------------|-------------------------------------|----------------------------------|---------|
| Mean ± SD             | 6.1 ± 1.66                          | 7.66 ± 1.52                      | 0.001   |
Discussion:
Urethral strictures are difficult to manage for urologists due to its nature of recurrence. OIU is standard treatment of urethral strictures with varying success rates although not as good as open urethroplasty. With the rise of endoscopic equipment, the first report of direct vision was seen in 1885 and has been gold standard of cold knife urethrotomy since 1971. In this study, age ranges of the patients were between 18 to 65 years. The mean age was 35.6±13.05 and 37.04±13.04 years in group-A and Group-B respectively (p =0.698). In the study done by Kumar, observed that median age at presentation of urethral stricture was 47 years (17-80). Mean Q max was 12.23±2.5 ml/sec in Group-A and 13.12±2.14 ml/sec in Group-B (p=0.18). Q max after 3 months of operation was 21.15±1.52 ml/sec in Group A & 21.25±1.56 ml/sec in Group B (p=0.81). Q max after 6 months of operation was 19.10±1.10 ml/sec in Group A and 21.14±1.11 ml/sec in Group B and after 9 months 18.50±1.15 ml/sec in Group A and 20.55±1.20 ml/sec in Group B. There was statistically significant between these two groups (pÂ0.05). The current study result Q max was similar with the previous study done by Palminteri, Q max improved from a mean of 8.4ml/ sec (range 4 to 11 ml/sec) preoperatively to 28.8 ml/sec. (range 16 to 11 ml/sec) after 6 months postoperative period. Preoperative voiding time was 85.50±2.65 sec in Group A and 86.35±3.15 sec in Group B (p=0.30). Voiding time after 6 months of operation was 29.40±2.40 sec in Group A & 30.38±3.25 sec in Group B (p=0.23). There was significant statistical difference between preoperative and post operation in both groups. Voiding time decrease from mean 90.52 sec (preoperative) to mean 30.25sec after 6 months of postoperative period in the study of Jiang. Regarding complications after operation bleeding, extravasations of urine and Infection was seen 1(4%), 1(4%), and 1(4%) in Groups-A and 2(8%), 0(00%) & 1(4%) in Group-B respectively which was not statistically significant (pÂ0.05). In the study done by Kumar, in experimental group 2 (4.50%), 3 (7.56%) and 2 (4.52%) patient developed bleeding, extravasations of urine and infection respectively. In this study post-operative recurrences of stricture were higher among those without Triamcinolone than subjects with Triamcinolone which was statistically significant (p=0.033) at 6 month and (p=0.016) at 9 months. In the previous study done by Kumar overall recurrence after OIU with Triamcinolone was 19.4%. Mazdak reported study on 25 patients treated OIU with triamcinolone inj. recurrence was seen in 21.7% and among 21 patients treated by OIU, recurrence was 50%. Korhonen and colleagues reported on 21 patients underwent only OIU, 71% patient develop recurrence while 17 patients received triamcinolone injection after OIU, 61% develop recurrence. Hardec observed in case series that patients treated by OIU without steroid injection, the rate of recurrent of stricture was 19.4%. Using inj. of triamcinolone, the recurrence rate was reduced to 4.3%. The similarity of these studies suggests that triamcinolone inj. during OIU may decrease the recurrence rate significantly. Regarding mean time interval in month of development of recurrence of stricture was 6.1±1.66 months in Group A and 7.66±1.52 months in Group B which was statistically significant (p=0.001). Study done by Venkatachalam, 19 of 33 patients were treated OIU with triamcinolone and 14/33 had only OIU, mean time to recurrence in experimental group was 9.6 months compared to 7.09 months in control group which was statistically significant. The similarity of the results in these studies suggests that triamcinolone inj. during OIU decrease the recurrence rate and delays the recurrence of stricture urethra significantly. In this study, recurrence rates of anterior urethral stricture were statistically significant between two groups. OIU with intralesional triamcinolone inj. is better than OIU alone.

Conclusions:
Optical internal urethrotomy with intralesional triamcinolone injection is better than optical internal urethrotomy alone. It significantly reduces the recurrence of stricture and delayed the recurrence of anterior urethral stricture at least for short term.
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