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LONG-TERM EFFICACY OF FULGURATION OF TRIGONITIS FOR RECURRENT URINARY TRACT INFECTIONS IN WOMEN.

Hypothesis / aims of study
Women with longstanding history of Recurrent Urinary Tract Infections (RUTIs) represent a challenging population because of gradual development of antibiotic resistance and frequent antibiotic allergies. We report on the long-term result of women with RUTIs and trigonitis who were treated with endoscopic fulguration and were prospectively followed.

Study design, materials and methods
Following IRB approval, charts of non-neurogenic women with RUTIs (defined as ≥3 UTIs per year), and normal upper tracts, who underwent only Cystoscopy with Fulguration of Trigonitis (CFT) under anesthesia with 1 year minimum follow-up after CFT were reviewed. Exclusion criteria included neurogenic bladder, incontinence or voiding dysfunction requiring additional procedures, and uncontrolled diabetes. Trigonitis was defined as areas of infection with pus-appearing pockets covering >50% of the trigone (figure 1). CFT was performed with a 17.5 French female scope and a fine tip bugbee electrode on a low setting of 20 on an outpatient basis. Primary outcome for cure was complete resolution of trigonitis based on follow-up office cystoscopy 6 months after CFT (figure 2). Secondary outcomes were total number of Antibiotic Courses (AC) prescribed for UTI related symptoms and Positive Urine Cultures (PUC) in the years following CFT. Not all women with positive urine cultures were treated and vice versa not all women who received antibiotic courses obtained a urine culture before treatment. Therefore, one or both of these events (AC and/or PUC) was chosen to study the course of RUTI after CFT. Since these patients experienced ≥3 UTIs yearly pre-CFT, patients with 0 total AC and/or PUC over the follow-up period after CFT were defined as “completely cured” of RUTI. Those who averaged between $0 < X \leq 2$, and >2 yearly AC and/or PUC were defined as “improved” and “no improvement” respectively. We hypothesized that patients with complete trigonitis resolution after CFT would fare best.

Results
From 2004 – 2008, 33/92 women met strict study criteria with mean follow-up of 48 ± 19 months (14 – 82). Excluded women were: neurogenic (5), urethral dilation (47), injectable agents (6), lost to follow-up (1). Patient demographics are presented in Table1. Complete resolution of trigonitis on cystoscopy at 6 months was noted in 25 (76%) patients. Over the following 5-9 years, the cystoscopically cured group averaged 0.51 ± 0.5 total AC and/or PUC per year compared to 2.03 ± 1.1 total yearly AC and/or PUC for patients with some degree of persistent trigonitis by cystoscopy following CFT (p=0.006) (Table 2). Long-term outcomes categorized as RUTI cure, improvement, or no improvement are presented in Table 3.

Interpretation of results
RUTIs can be due to residual sites of chronic infection embedded in the trigone, leading to trigonitis as evidenced on office cystoscopy. Once upper tract studies, urinary incontinence, or voiding dysfunction leading to residual urine have been eliminated as potential RUTI sources, CFT can be considered as a treatment solution to eradicate persistent sites of trigonal infection/inflammation. This study indicates that after the trigone has completely healed and returned to a normal appearance after CFT, nearly three-quarter of women will benefit from durable control of RUTIs. Conversely, when the follow-up office cystoscopy at 6 months after CFT documented recurrent trigonitis or extension of the cystitis beyond the confines of the trigone, the rate of RUTIs as measured by positive urine culture and/or antibiotic course remained higher, although improved compared to baseline.

Concluding message
In this long-term study on the role of cystoscopic fulguration of trigonitis for RUTIs, women with complete resolution based on office cystoscopy at 6 months after CFT did best; However, even in the group with a partial response, the procedure was useful in reducing the number of yearly RUTI events. Eradication of bacterial reservoirs in the trigone appears beneficial.

Table 1 Baseline characteristics of patient populations with successful and failed resolution of trigonitis based on office cystoscopy at 6 months

	Successful CFT (n=25)	**Failed CFT (n=8)**
Follow-up (Mean ± S.D)	50 ± 19 months Range: 21-82 months	41± 19 months Range:14-63 months
Age	68 ± 14	76 ± 11
BMI	25 ± 6	23 ± 3
Parity	2 ± 2	0.7 ± 1
Urinary Incontinence (%)	56	63
Hysterectomy (%)	68	50
Menopause or Oophorectomy (%)	65	50
Hormonotherapy (%)	24	25
Sexually active (%)	36	50
Diabetes (%)	12	0

Table 2 Mean number of AC and/or PUC recorded for UTI related symptoms during the follow-up period in both groups of patients.

	Follow-up (Months) Mean ± S.D	Average AC and/or PUC per year after CFT
Successful CFT (n=25)	50 ± 19	0.51 ± 0.5
Failed CFT (n=8)	41± 19	2.03 ± 1.1
		p = 0.006

Table 3 Since these patients experienced >3 UTIs yearly pre-CFT, patients with 0 total AC and/or PUC over the follow-up period after CFT were defined as "completely cured" of rUTI. Those who averaged between $0 < X \leq 2$, and 2 yearly AC and/or PUC were defined as "improved" and "no improvement" respectively.

	Successful CFT (n-25)	**Failed CFT (n=8)**
Completely cured	8 (32%)	0 (0%)
Improved	17 (68%)	5 (63%)
No Improvement	0 (0%)	3 (37%)

Fig 1: Flexible cystoscopy performed prior to fulguration reveals characteristic Trigonitis with bullous edema and submucosal calcifications (left). A closer view of trigonal inflammation shows two large mucosal pus containing pockets (right).

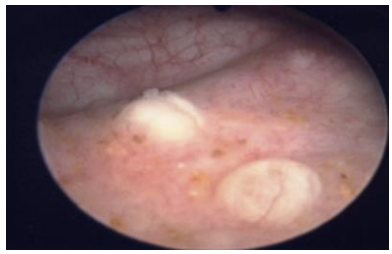

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Fig 2: At 6 month following cystoscopic fulguration of trigonitis, office cystoscopy reveals a well healed trigone with no areas of residual trigonitis.