

ORIGINAL ARTICLES

EVALUATION OF TRANSURETHRAL ETHANOL ABLATION OF THE PROSTATE (TEAP) AS A TREATMENT OPTION FOR PROSTATIC OBSTRUCTION

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ABSTRACT

Objective: A prospective study evaluating transurethral ethanol ablation of the prostate (TEAP) as a treatment option for benign enlargement of the prostate (BEP) in the University Teaching Hospital, Lusaka, Zambia.

Patients and Methods: Elective TEAP using a simple cystoscopy and a long needle was performed in 45 patients who have now been followed for 30 months.

Results: Pre- and postoperative comparison of the American Urological Association

Symptom Index and maximum urine flow rates revealed significant improvement with minimal discomfort and no major complication.

Conclusions: Chemo-ablation of the prostate by means of transurethral ethanol injection in selected patients is encouragingly successful.

Key Words: Benign enlargement of the prostate (BEP), ethanol ablation, prostatic obstruction

INTRODUCTION

Traditionally, transurethral resection of the prostate (TURP) has been the gold standard treatment for benign enlargement of the prostate (BEP). Since the early 1990s, medications such as α -blockers, and more recently various new minimally invasive procedures such as laser ablation and microwave therapy have also been used. The goal of these new treatments for BEP has been to achieve clinical relief less invasively than with TURP, while proving cost-effective and precluding troublesome complications such as major hemorrhage, TURP syndrome and retrograde ejaculation.

We report our initial experience with transurethral intra-prostatic injection of dehydrated alcohol as a treatment modality for obstructive BEP.

PATIENTS AND METHODS

A total of 45 patients with documented bladder outlet obstruction secondary to BEP were enrolled in the study. The median age of our 45 patients was 65 years (range 50 to 84 years).

The inclusion criteria were:

- Mild to moderate BEP diagnosed on digital rectal examination (DRE).
- American Urological Association Symptom Index (AUA-SI) >19.
- No history of acute retention of urine.
- No suspected prostatic or bladder malignancy.
- No history of previous surgical management for BEP.
- No previous history of pelvic surgery or trauma.

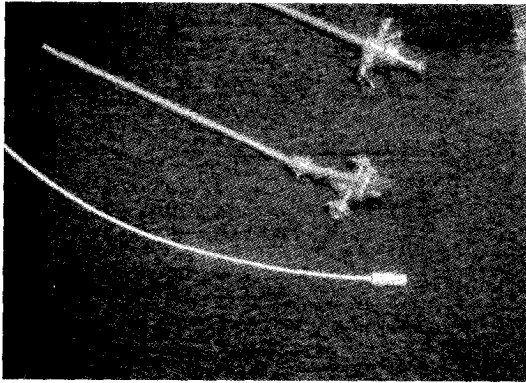


Fig. 1: Cystoscope and needle used for the intraprostatic ethanol injection

All patients provided informed consent to undergo this elective procedure. Urine analysis was done for every patient while urine culture was done if needed to treat urinary tract infection prior to the procedure. Ultrasound was performed in each case to document prostate size and to measure the post-void residual urine.

Cystoscopy was done to evaluate the length of the prostatic urethra, median lobe involvement and to exclude bladder pathology. DRE was done to exclude prostate cancer. This is the only method available in our environment, since the cost of prostate specific antigen (PSA) determination is too high.

With the patient under regional anesthesia, transurethral injections were performed at least 1.5 cm. proximal to the external sphincter, at the 3 and 9 o'clock positions in the lateral lobes. The depth of the needle deployment was 10 mm and the volume of alcohol was 2 to 5 ml per injection, adjusted according to prostate size (Fig. 1). No injection was done in the median lobe.

The patients went home the next day. Post-treatment Foley catheter drainage was used for 72 hours. Patients were evaluated for peak urine flow rate, and AUA-SI prior to, and 1, 3, 6, 12, 18, 24, and 30 months after the procedure.

RESULTS

The patients presented with a mean preoperative AUA-SI of 21.7 (range 19 to 33). Preoperatively the mean peak urine flow rate (Qmax) was 6.2 ml/sec (range 5 to 11 ml/sec) and the average prostate size was 45 gm (range 24 to 78 gm.). We left all catheters in place for 3 days. On one occasion the catheter was reinserted for an additional 3 days.

At one month postoperatively the mean AUA-SI had decreased from an initial value of 21.7 to 11.5 (Fig. 2). The mean urinary Qmax had increased from 6.2 ml/sec to 8.8 ml/sec (Fig. 3). At 3 months post-operatively the average AUA-SI was 8.3, while the mean Qmax had increased to 11.7 ml/sec. At 6 months the average AUA-SI had further decreased to 5.8 ($p < 0.01$) while the mean Qmax had increased to 12.5 ml/sec ($p < 0.05$).

At 12, 18, 24 and 30 months the average AUA-SI was steady at 5.6 representing a decrease of 76% from the preoperative value and the mean Qmax remained at 12.6 ml/sec representing a two-fold improvement. There was no significant change in prostate volume. The mean residual urine volume decreased from 129.1 to 35.6 ml. ($p < 0.05$).

Careful monitoring for complications confirmed the remarkable safety of this procedure. All patients experienced transient light hematuria, which cleared during the first 24 to 48 hours and did not require any intervention. There was no need for postoperative administration of narcotic analgesia. Thirty-eight of 45 patients were sexually active at the time of the procedure; none of them complained of retrograde ejaculation after the intervention. Only one patient developed retention of urine and underwent TURP. Four patients were lost to follow up after the 6-month postoperative visit. With respect to cost-effectiveness, the cost of ethanol injections was \$ 50 compared with \$ 650 for TURP.

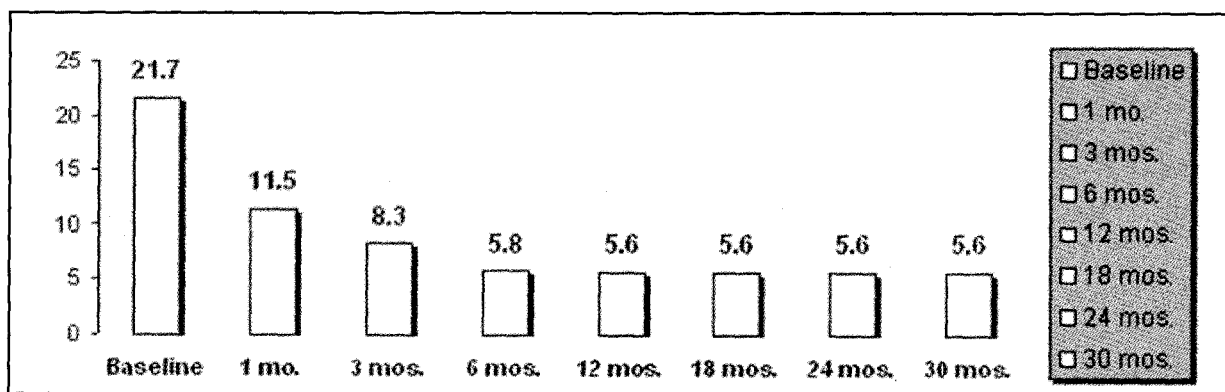


Fig. 2: AUA symptom score before and after TEAP

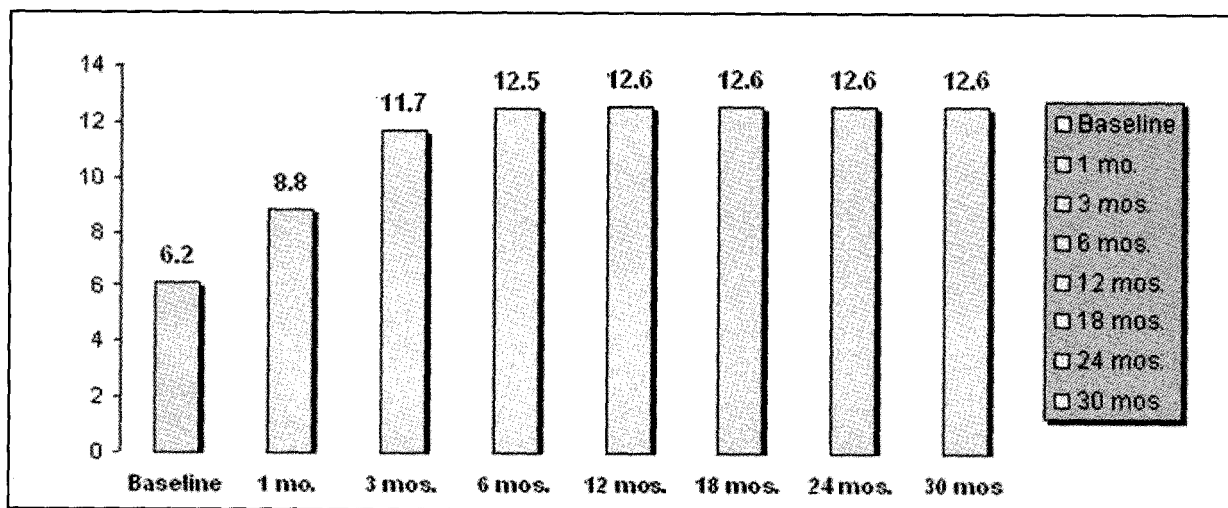


Fig. 3: Mean peak urinary flow rate (ml/sec) before and after TEAP

DISCUSSION

Absolute ethanol has been used for tissue ablation and nerve blockade with great success in the last several decades. When dehydrated alcohol is injected into living tissue, it induces cell swelling and lysis, since it is freely permeable through the cell membrane. When ethanol is injected into human tissues, it produces hemorrhagic coagulation necrosis and thrombotic closure of local arterioles and venules¹. This effect has been successfully used for treating various lesions, including thyroid adenoma² and hepato-cellular carcinoma³. In the field of urology, ethanol injections have been used for the ablation of renal cysts⁴ and for segmental or total therapeutic embolization of the kidney⁵.

The feasibility of injection therapy for the local ablation of BEP has long been explored⁶⁻⁹. Littrup et al. in 1988 reported the ability to ablate prostate tissue via the injection of ethanol transperineally¹⁰. However, their results were compromised by a high rate of external sphincter necrosis and urinary incontinence because the transperineal approach used did not enable them to target precisely the intraprostatic injection. In a subsequent study on 10 humans, Goya et al. achieved a decrease in AUA-SI from 23.1 to 12.2 and an increase in urinary Qmax from 8 to 13.1 ml/sec 3 months postoperatively¹¹.

In a European multi-center evaluation of 115 patients with symptomatic BPH treated by transurethral ethanol ablation, Grise et al. achieved a significant reduction of lower

urinary tract symptoms and a decrease of International Prostate Symptom score (IPSS) and Quality of Life (QoL) scores by more than 50%, while peak flow rates improved by 35%¹².

Transurethral ethanol ablation of the prostate is a relatively simple procedure that can be completed in about 15 minutes with local anesthesia by conscious sedation. Urologists must be mindful of potential complications of injection of ethanol¹³⁻¹⁴. TURP remains the gold standard for the definitive relief of BEP. Nevertheless, intraprostatic ethanol injections have produced remarkable sustained symptomatic relief without the risk of any serious life-threatening complications, such as TURP syndrome or blood loss requiring transfusion.

In conclusion, initial studies indicate the safety and practicability of TEAP using regional anesthesia as one of the modalities to treat obstructive BEP. The success of this procedure is evidenced by the significant decrease in AUA-SI and the increase in peak urine flow rate. Pending confirmation in a larger long-term multi-institutional trial that is currently under way, this technique promises to represent a simple, inexpensive option for treating symptomatic BEP.

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RESUME

EVALUATION DE L'ABLATION TRANS-URETRALE A L'ALCOOL DE LA PROSTATE
COMME UNE OPTION DU TRAITEMENT DE L'OBSTRUCTION PROSTATIQUE A
L'HOPITAL UNIVERSITAIRE A LUSAKA - ZAMBIE

Objectif: Une étude prospective qui évalue l'ablation trans-urétrale à l'éthanol de la prostate (TEAP) comme une option thérapeutique pour l'hypertrophie bénigne de la prostate dans l'Hôpital Universitaire de Lusaka, Zambie.

Patients et Méthodes: TEAP élective utilisant un simple cystoscope et une longue aiguille a été réalisée chez 45 patients suivis avec un recul moyen de 30 mois.

Résultats: La comparaison pré et postopératoire de l' American Urological Association symptom score et du débit maximum urinaire a été réalisée. À 12 et jusqu'à 30 mois de suivi l'AUA symptom

score moyen avait diminué de 76% par rapport à la valeur préopératoire ($p < 0.01$). Le débit urinaire maximum moyen avait été le double ($p < 0.05$). Il n'y avait aucun changement considérable dans le volume de la prostate. Le résidu post mictionnel moyen a diminué de 129.1 à 35.6 ml. ($p < 0.05$). Il y a eu une amélioration considérable avec gêne minimale et aucune complication majeure.

Conclusions: L'ablation chimique de la prostate au moyen d'injection d'éthanol par voie trans-urétrale chez les patients sélectionnés est efficace et sans complications notables.

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