QUALITY OF LIFE IN PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA (BPH): ENDOSCOPIC SURGERY VERSUS LASER THERAPY

Irache Abáigar-Pedraza, Antonio Miguel Pelluch-Auladell, Juan Francisco Galiano-Baena, Alejandra Mira-Moreno, Diego Fernando Bravo-López and Juan José Lobato-Encinas.


Summary.- OBJECTIVE: To compare the results observed in the quality of life of patients after transurethral prostate resection (bipolar TUR) or laser therapy.

METHODS: This is a retrospective observational cohort study: one cohort includes patients who underwent endoscopic surgery, and the other patients undergoing laser therapy (vaporization). A total of 106 patients were included, divided into two cohorts. Two questionnaires were prepared for those who fulfilled inclusion criteria, the International Prostate Symptom Score (IPSS), two months before and six months after the date of surgery, and Benign Prostate Hyperplasia Patient Impact Measure (BPH - PIM) six months after surgery. We consider a statistical significance level, p < 0.05% and a confidence interval (CI) of 95 %.

RESULTS: Mean prostate size was 55 cc in the endoscopic surgery cohort versus 40 cc in the laser therapy cohort (p = 0.02). 35.8 % of patients treated with laser therapy had urinary irritative symptoms compared with 6.3 % in the endoscopic surgery group (p = 0.01).

Within the laser group, 26.4 % of patients had urine leakage compared to 4.4 % among those operated by bipolar TUR (p = 0.03). 86.7 % of patients in the cohort of bipolar TUR were fully satisfied after surgery compared to 53.6 % of the laser therapy cohort (p = 0.03).

CONCLUSION: In this retrospective observational cohort study, the patients of LBO laser therapy cohort had a worse quality of life the following six months after surgery compared to those who underwent bipolar transurethral resection.

Keywords: Benign prostatic hyperplasia. Transurethral prostate resection. Laser therapy. Quality of life. Lower urinary tract symptoms.

CORRESPONDENCE

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La media del tamaño de próstata es de 55 centímetros cúbicos (cc) en los intervenidos con cirugía endoscópica frente a 40 cc en los operados mediante cirugía láser (p = 0,02). El 35,8% de los pacientes intervenidos con cirugía láser presentaron una clínica irritativa miccional frente al 6,2% de los intervenidos con cirugía endoscópica (p = 0,01).

CONCLUSIONES: En este estudio observacional retrospectivo los pacientes intervenidos mediante cirugía láser con láser LBO (LBO = triborato de litio) presentaron un empeoramiento de la calidad de vida en los seis meses posteriores de la intervención con respecto a los que fueron intervenidos mediante resección transuretral bipolar.


INTRODUCTION

Increased prostate size, known as Benign Prostatic Hyperplasia (BPH) causes symptoms in the lower urinary tract (LUTS). This causes a great impact on the quality of life of such patient.

The surgical treatment for this pathology can improve these symptoms and thus the quality of life, although in some cases, the side effects of surgery get it worse (1-3). In usual clinical practice, the surgical treatment of prostate hyperplasia is the last step.

There are several surgical options: open surgery, endourethral (transurethral resection of prostate (bipolar TUR) and laser therapy. Bipolar TUR is the method of choice, but it has its complications. Literature highlights postoperative bleeding, retrograde ejaculation (65-70 %), urinary incontinence (2.2%) and erectile dysfunction, among others (4).

Laser treatment is considered an alternative to transurethral resection. Different laser systems produce different effects on the tissue. They can produce a vaporization or coagulation of the tissue, in both cases this technique aims to achieve similar efficiency in symptoms and quality of life, but with less morbidity and hospitalization time compared with bipolar TUR (5). However it is not without complications either. For example: an incontinence rate of 1%, urethral stenosis of 3% and 1.5 % need to be reoperated. There are different types of lasers (6). For this study we used the laser LBO (120W) which causes high energy absorption in the prostate with low penetration depth which leads to vaporization of the prostate tissue with hemostatic properties. The main drawback of this technique is its high cost. Additionally, there are no studies that support its longterm benefits as it is very recent (3 or 4 years) and acquiring surgical skil involves a long learning curve.

In the Department of Urology we have observed that in the follow-up of postoperative BPH patients, those with laser surgery reported a higher frequency of urinary irritative symptoms. Thus, patients have sense of urgency, appearance or increase of urinary frequency, nocturia and urine leakage. While in those operated with bipolar TUR these symptoms do not appear so frequently.

There are several questionnaires to assess the irritative urinary symptoms and their impact on quality of life from a more objective point of view (7, 8, 9). In this study we have selected two of them: the IPSS and BPH-PIM questionnaires. The two have both external and internal validity (10, 11) and are validated in Spanish (10, 11). The IPSS (Appendix 1) is an international index that rates the severity of LUTS, it is a seven-item questionnaire. BPH-PIM (Appendix 2) questionnaire includes questions about the quality of life and consists of 20 items (13,14). The answers of both questionnaires have five options and measure the severity, from low to high intensity, of the symptom referred to in each question.

Thus our propose is to collect postoperative symptoms of both groups and to assess the impact on quality of life that occurs in the patients.
MATERIAL AND METHODS

The aim of our study is to compare the results observed in the quality of life of patients undergoing transurethral resection of prostate (TUR bipolar) or laser therapy (laser LBO) at six months after surgery.

A retrospective observational cohort study was performed. We value patients diagnosed with BPH, which required surgical treatment. Depending on the preferences of each patient and the urologist criteria, we assigned the patients to the cohort of endoscopic surgery RTU bipolar (Plasmakinetic System, Karl Storz) or to the cohort of laser surgery 120W LBO (Green Light HPS (High Performance System is assigned), with a power of 120W). All study participants completed two questionnaires: IPSS and BPH -PIM. The IPSS was delivered two months before and six months after the date of surgery and the BPH -PIM, six months after the date of surgery. Both were delivered during the initial check-up in the consultation and any doubts about them were cleared up by the specialist.

Patients in both groups were operated on by two surgeons of Urology staff. They began performing laser prostate surgery in 2007 and the study started in 2009, so patients of this study do not consider that form part of their training or learning curve.

Subjects

To calculate the sample size we used the program Epidat.3, with an alpha error of 0.05% and a statistical power of 80%. According to scientific literature we found that the frequency of patients with BPH operated by bipolar TUR and laser therapy is 48% (11) and, as the study was observational and retrospective a sample size of 104 patients it is required, so we collected two groups of 52 patients and to compensate the losses (1-2 %), a total of 106 patients were selected (53 in each group) 53 patients operated on with green laser from 2009 to 2011 and the same number of those undergoing conventional RTU are studied. Of the last group five patients were lost because they did not return to the query after the intervention, so are removed from the study 48 patients ultimately resulting.

All patients signed an informed consent where it is collected that their data will be used for this study.

Inclusion criteria

Prostate size between 38 and 70 cc measured by abdominal. Digital rectal examination: adenomatous prostate or fibroelastict 60-75 years BMI < 30 (weight (kg) / (height^2 (m^2))).

All patients signed an informed consent form which referred to the surgpering intervention and inclusion in the study. Criteria for surgical indication (renal failure, bladder stones, episodes of repetitive acute urinary retention, recurrent urinary tract infection, hematuria refractory to medical treatment).

Exclusion criteria

Surgical complications such as conversion, preforation and frank hematuria. Symptomatic improvement with pharmaceutical treatment. Pathology that conditions a neurogenic bladder. Variables of the study: Age, BMI, Prostate size, IPSS, BPH -PIM, irritative symptoms. The presence of novo symptoms not mentioned in the questionnaires.

The IPSS, contains 7 items. Each of the items is scored from 1 to 5 depending on the frequency of the symptoms (1 never present and 5, always present). The questionnaire associates a grade of severity based on the sum of the frequency of each item: mild (0-7), moderate (8-19) and severe (20-35).

The BPH -PIM questionnaire consists of 20 items, including 15 standardize and 5 single. Each of the items is measured following the Likert score, assigning 5, to the best state of quality of life and 1 to the worst. The single questions, consist of a list of 16 activities of daily living that may be interfered with, as a result of the patient’s clinical situation. This list may be increased by three activities chosen by the patient but that are not included in the list. With a maximum total of 5 activities. Depending on the sum of the scores obtained, the patient is included in the group of quality of life very poor, poor, fair, very happy, very happy, depending on the score they obtained: 15 to 26, 27 to 38, 39 to 50, from 51 to 62 and 63 to 75 respectively.

As for de novo symptoms afflicting the patient, they are treated as an open response and the symptoms will be annotated as soon as they appear. Statistical analysis For the statistical comparison of the results obtained the SPSS Statics 17.0 program is used.

It is considered statistically significant when the alpha error is less than 0.05. The confidence interval is 95 %. The power of the study is 80%.

The statistical test used is the T-Student, to compare two quantitative variables or a qualitative and quantitative and Chi-Square to compare two

qualitative variables. Conditions of use of each statistical test are verified. All variables meet the criteria of parametric variables.

RESULTS

After performing the pertinent analysis and its corresponding contingency tables, we obtained the results described below.

There were no statistically significant differences in age and BMI.

The patients operated on by TURP bipolar have an average prostate size of 55cc ± 12,29 cc, compared with those who operated by laser therapy which is 40 cc ± 2, 24 p< 0,02.

As it is shown in Figures 1 and 2, a similarity is noted in IPSS values before surgery, which is reflected in the group of patients with severe symptoms (p = 0,3) and in terms of the values of IPSS after surgery the group of patients with mild symptoms predominates (p < 0,08).

As can be seen in Figure 3, among the patients in the cohort of laser therapy, 19 (35,8 %) reported irritative symptoms (urgency, frequency and nocturia) versus 3 (6,3 %) of the patients operated by bipolar TUR showing a significant difference with a p= 0.01. Among the 19 patients of the laser therapy group with presence of irritative symptoms, two had retrograde ejaculation, one strangury and two had to be re-operated. Of the 3 patients operated endoscopic surgery with irritative symptoms, one had impotence. Fourteen laser therapy group patients (26.4 %) had urine leakage after Valsalva maneuvers (drip or greater escape). Among them, twelve solved the problem with pad use and two required a change at their underwear. However in the bipolar TUR group only two (4,4%) had urine leakage that required pad use for one and a change of underwear for the other, this difference is significant with a p-value of 0,03.

Figure 4 shows the quality of life of patients after six months after the operation according to the cohort to which they belong. Forty-two patients (87.5 %) of the forty-eight in the bipolar TUR cohort claimed a very satisfactory quality of life (very happy) versus thirty-six patients (56.6 %) of the fifty-three laser cohort. This difference is significant at p = 0,03.

As for the open questions in the BPH-PIM questionnaire, no conclusive evidence has been obtained, as only 5 of the respondents filled this paragraph.

DISCUSSION

Recently there have been several articles, comparing laser surgery versus conventional RTU. Thus, the article written by Tang K, et al. (12) consists of a systematic review and meta-analysis of the literature comparing patients underwent laser thulium (Tm: YAG), vaporization, versus RTU. In all of these studies they measure the quality of life and the IPSS of each group of patients. This study found a significant difference in IPSS and quality of life the first month after surgery.
of the intervention, referring to a better quality of life and fewer IPSS in the RTU. Patients. However the differences in the second, sixth and twelfth month were not statistically significant. The differences in terms of urge incontinence or effort in both groups were not significant.

In the quasi-experimental prospective study of C Vargas et al. (14) 55 patients operated on by laser surgery Tm: YAG 150W power were evaluated. 13.7% of patients had irritative symptoms six months after the surgery. Due to the characteristics of the study is not known whether the patients have this symptoms before the intervention or appear the novo after laser surgery.

In the study of Pereira - Correia, et al. (15) 50% of patients underwent by laser surgery (LBO 120W) appeared urgency urinary symptoms which seemed not to be associated with detrusor overactivity. They reported that these symptoms disappeared 3-12 months after the surgery.

The study of Kim J, et al. (13), is a retrospective study comparing patients operated on by TURP and laser Tm: YAG. They measured, among other variables, IPSS, irritative urinary symptoms and urinary incontinence after a month of the intervention. In the laser surgery cohort IPSS presented a significantly reduction compared with the TUR cohort and the presence of dysuria and urinary incontinence a month after the surgery were significantly higher in the cohort of laser surgery.

The study of K Chacko et al. (1) is a multicenter randomized controlled study comparing a group of patients underwent TURP and another operated on by surgery laser (Laser (Nd) : YAG.)

In this study there are no statistically significant difference between the two groups in relation to variations of IPSS before and after the surgery. However existing an error rate that is significantly higher in the laser branch and some patients had to be reoperated with conventional RTUP. In fact, these authors recommend transurethral resection as first choice in the treatment of acute urinary retention due to BPH.

In our study, we notice a significant improvement of irritative symptoms and quality of life in patients underwent endoscopic surgery and this was evident at six months after surgery, in favour of endoscopic surgery. The fact that some studies (12, 13, 14) relate an advantage of a shorter length of hospital stay, there does not seem to be a strong argument if urinary irritative symptoms persist over time.

A limitation of our study is not to have a prior urodynamical study to rule out bladder pathology that could condition a clinic previously the surgery. Since it although attending IPSS preoperatively, were not mentioned if the prevalence of symptoms was irritive or obstructive.

Moreover this is a retrospective study, so we can not draw firm causal criteria. However, these results suggest the need to approach the design of a prospective, randomized study to evaluate the quality of life of these patients study.
All these studies, including ours, have a short time of follow up, not exceeding one year, so we cannot know the evolution in a large period of time of those variables that have no significant difference.

**CONCLUSION**

After analyzing the data collected, it can be inferred that the differences found are statistically significant, so we conclude that the intervention of patients with BPH through laser therapy with LBO laser has a worse quality of life during the six months after surgery compared to those operated by bipolar transurethral resection.

But prospective, randomized, controlled studies are needed, with longer period of follow up in order to confirm the persistence of these symptoms and assess in a long term the quality of life.

<table>
<thead>
<tr>
<th>In the past month:</th>
<th>Not at All</th>
<th>Less than 1 in 5 Times</th>
<th>Less than Half the Time</th>
<th>About Half the Time</th>
<th>More than Half the Time</th>
<th>Almost Always</th>
<th>Your score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Incomplete Emptying</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
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<tr>
<td>How often have you had the sensation of not emptying your bladder?</td>
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<tr>
<td>2. Frequency</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
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<tr>
<td>How often have you had to urinate less than every two hours?</td>
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<td>3. Intermittency</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>How often have you found you stopped and started again several times when you urinated?</td>
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<td>4. Urgency</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
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<tr>
<td>How often have you found it difficult to postpone urination?</td>
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<td></td>
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<tr>
<td>5. Weak Stream</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
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<tr>
<td>How often have you had a weak urinary stream?</td>
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<td></td>
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<tr>
<td>6. Straining</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
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<tr>
<td>How often have you had to strain to start urination?</td>
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<tr>
<td>7. Nocturia</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
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<tr>
<td>How many times did you typically get up at night to urinate?</td>
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<tr>
<td><strong>Total I-PSS Score</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Score:** 1-7: **Mild**  8-19: **Moderate**  20-35: **Severe**

Appendix 1. International Prostate Symptom Score (IPSS).
### Quality of Life Due to Urinary Symptoms

<table>
<thead>
<tr>
<th>If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?</th>
<th>Delighted</th>
<th>Pleased</th>
<th>Mostly Satisfied</th>
<th>Mixed</th>
<th>Mostly Dissatisfied</th>
<th>Unhappy</th>
<th>Terrible</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

**Appendix 1. International Prostate Symptom Score (IPSS).**

**International Prostate Symptom Score (I-PSS)**

**Patient Name:** ______________________  **Date of birth:** ________  **Date completed:** _______

**Score:**

1-7: **Mild**

8-19: **Moderate**

20-35: **Severe**

**In the past month:**

- 0: **None**
- 1 Time
- 2 Times
- 3 Times
- 4 Times
- 5 Times

**Sus problemas de próstata o al orinar, ¿cuánta frustración en general le ha causado?**

- Mucha
- Bastante
- Alguna
- Poca
- Nada en absoluto

**Sus problemas de próstata o al orinar, ¿cuánta vergüenza le han causado?**

- Mucha
- Bastante
- Alguna
- Poca
- Nada en absoluto

**Sus problemas de próstata o al orinar, ¿cuánta incomodidad le han causado?**

- Mucha
- Bastante
- Alguna
- Poca
- Nada en absoluto

**Sus problemas de próstata o al orinar, ¿cuánto han afectado a la confianza en sí mismo?**

- Mucha
- Bastante
- Alguna
- Poca
- Nada en absoluto

**Sus problemas de próstata o al orinar, ¿cuánto han afectado a su estado de ánimo?**

- Mucha
- Bastante
- Alguna
- Poca
- Nada en absoluto

**Sus problemas de próstata o al orinar, ¿cuánto han afectado a su capacidad para disfrutar de sus actividades?**

- Mucha
- Bastante
- Alguna
- Poca
- Nada en absoluto

**¿Qué le ha agobiado el pensar que sus síntomas de próstata o al orinar empeoren en el futuro?**

- Mucha
- Bastante
- Alguna
- Poca
- Nada en absoluto

**Mis problemas de próstata o al orinar me impiden beber líquidos por la noche**

- Siempre
- La mayoría de la vez
- A veces
- Rara vez
- Nunca

**Tengo dificultades para dormir toda la noche debido a mis problemas de próstata o al orinar**

- Siempre
- La mayoría de la vez
- A veces
- Rara vez
- Nunca

**Me encuentro limitado al tener que planear mis actividades según haya o no asesor**

- Siempre
- La mayoría de la vez
- A veces
- Rara vez
- Nunca

**EN LAS DOS ÚLTIMAS SEMANAS... Por favor marque (X) la casilla apropiada**

**Tardo más en llegar a los sitios porque necesito hacer paradas frecuentes para orinar**

- Siempre
- La mayoría de la vez
- A veces
- Rara vez
- Nunca

**Los problemas de próstata o urinarios afectan a mi rendimiento sexual**

- Siempre
- La mayoría de la vez
- A veces
- Rara vez
- Nunca

**Appendix 2. Benign Prostate Hyperplasia Patient Impact Measure (BPH – PIM).**
***REFERENCES AND RECOMMENDED READINGS

(*of special interest, **of outstanding interest)


