Benign Prostatic Hyperplasia

Holmium Laser Enucleation versus Transurethral Resection of the Prostate: 3-Year Follow-Up Results of a Randomized Clinical Trial

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Abstract

Objectives: To report 3-yr follow-up results of a randomised clinical trial comparing holmium laser enucleation of the prostate (HoLEP) with transurethral resection of the prostate (TURP).

Methods: A total of 200 patients with urodynamic obstruction and a prostate volume of less than 100 cc were prospectively randomised and assigned to HoLEP or TURP. All patients were assessed preoperatively and followed at 1, 6, 12, 18, 24, and 36 mo postoperatively. American Urological Association Symptom Score (AUA SS), maximum flow rate (Qmax), and postvoid residual (PVR) [urine] volume were obtained at each follow-up. Perioperative data and postoperative outcome were compared. All complications were recorded.

Results: AUA SS were significantly better 2 yr postoperatively in the HoLEP group (1.7 vs. 3.9, p < 0.0001) and similar at 3 yr (2.7 vs. 3.3, p = 0.17). PVR volume was significantly better 2 yr (5.6 vs. 19.9 ml, p < 0.001) and 3 yr (8.4 vs. 20.2 ml, p = 0.012) postoperatively in HoLEP patients. Qmax was similar in the HoLEP and TURP groups at 2 yr (28.0 vs. 29.1 ml/s, p = 0.83) and at 3 yr (29.0 vs. 27.5 ml/s, p = 0.41) postoperatively. Late complications consisted of urethral strictures, bladder-neck contractures, and BPH recurrence; reoperation rates were 7.2% in the HoLEP and 6.6% in the TURP group (p = 1.0).

Conclusions: After 2 and 3 yr of follow-up, HoLEP micturition outcomes compare favourably with TURP. Late complications are equally low. HoLEP may be a real alternative to TURP.

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1. Introduction

Transurethral resection of the prostate (TURP) is considered the gold standard of surgical treatment of bladder outlet obstruction (BOO) due to benign prostate enlargement (BPE) [1–3]. However, TURP is limited to prostates weighing less than 80–100 g and is associated with significant morbidity [1–4]. Therefore, a demand for less-invasive treatment modalities exists. During the last decade, several so-called minimal-invasive procedures emerged as less invasive than TURP. However, it became evident that, in these alternative techniques, the morbidity was shifted from the intraoperative towards the postoperative period [5]. None of these minimal-invasive procedures could compete with TURP in terms of durability of results and low reoperation rates. Advances in laser technology have led to the development of holmium laser enucleation of the prostate (HoLEP), and its genuine potential has now been broadly recognised. Short-term outcome data of several randomised clinical trials have proved that HoLEP was at least equally effective and less invasive than TURP [6–8]. However, randomised medium-term and long-term studies are rare [9]. Westenberg and coworkers [10] reported on a minimum of 4-yr follow-up results from a randomised trial comparing TURP with holmium laser resection of the prostate, which is similar to but has been replaced by HoLEP. Follow-up results comparing HoLEP with TURP of longer than 2 yr do not yet exist. We report the 2-yr and 3-yr follow-up results of our previously published randomised trial comparing HoLEP with TURP [6].

2. Materials and methods

2.1. Patients

The study was performed at the Urology Department, Auguste-Viktoria-Hospital, Berlin. Patients and methods have been previously reported in detail [6]. In summary, 200 patients were randomised to either HoLEP or TURP with a schedule balanced in blocks of four, after ethical approval and written consent of the patients were obtained. Inclusion criteria were American Urological Association Symptom Score (AUA SS) of 12 or more, Q_{\text{max}} of 12 ml/s or less, PVR volume of 50 ml or more, Schäfer grade of II or more in pressure flow studies, and a total prostate volume of less than 100 cc in transrectal ultrasound (TRUS). Exclusion criteria included previous prostate or urethral surgery and voiding disorders not related to benign prostatic hyperplasia (BPH). If indicated, prostate carcinoma was excluded by biopsy. Follow-up was assessed at 1, 6, 12, 18, 24, and 36 mo after surgery. Assessments consisted of AUA SS and Q_{\text{max}} as primary outcomes, and PVR volume and late complications as secondary outcomes of the study. Significant deteriorations of the micturition parameters triggered further investigations and reoperations were performed when indicated.

Incontinence and erectile dysfunction (ED) data after 12 mo follow-up have been previously reported [6]. Since alterations of incontinence and ED more than 1 yr after surgery may be significantly contributed to ageing and comorbidities rather than the HoLEP or TURP procedure, incontinence and ED were not assessed later than 1 yr postoperatively.

2.2. Surgical procedures

2.2.1. Holmium laser enucleation of the prostate

High-powered HoLEP was performed as previously described (2.0 J, 40–50 Hz, 80–100 W, reusable 550-µm laser fibres [Lumenis, Palo Alto, CA, USA]) [6]. In essence, the prostatic lobes were dissected away from the prostatic capsule in exactly the same plane in which the surgeon’s index finger moves during performance of open prostatectomy. Since at the time of our study, a mechanical tissue morcellator was not yet commercially available, the prostatic lobes were subtotally enucleated, and the devascularised lobes were then fragmented with the electrocautery loop into pieces small enough to be evacuated through the resectoscope sheath (“mushroom”-technique [11]). Coagulation of bleeding arteries was performed by defocusing the laser fibre. During HoLEP, saline was used as irrigation fluid and electrolyte-free solution for electrocautery loop tissue fragmentation.

2.2.2. Transurethral resection of the prostate

TURP was performed with a standard tungsten wire loop (Karl Storz, Tuttlingen, Germany), with a cutting current of 160 W and coagulating current of 80 W. In both procedures, postoperative bladder irrigation was used as necessary until haematuria had settled sufficiently to remove the catheter.

2.3. Statistical analysis

To obtain sufficient long-term results for the 5-yr postoperative final analysis, the initial sample size of the trial was calculated to be 100 patients per group. The overall yearly dropout rate was considered to be 15% of patients. In both groups, baseline characteristics and postoperative interim analyses of AUA SS, Q_{\text{max}}, and PVR volume were compared by using the Mann-Whitney U test, and postoperative adverse events by using the chi-square test. Friedman test was used to compare pre- and postoperative AUA SS, Q_{\text{max}}, and PVR volume within each group. Statistical tests were performed with the Statistical Package for the Social Sciences, version 12.0 for Windows. Two-sided tests with significance at 0.05 were used.

3. Results

3.1. Baseline characteristics

As shown in Table 1, there were no statistically significant differences in baseline characteristics between the two groups.
3.2. *Perioperative results*

Perioperative results were previously reported in detail [6].

3.3. *Outcomes*

3.3.1. *Micturition parameters*

Follow-up data of the two groups (1 mo to 3 yr postoperatively) are presented in Table 2. Both therapy modalities resulted in statistically significant improvements of AUA SS, Q\textsubscript{max}, and PVR volume at each postoperative assessment compared with baseline values. In the HoLEP group, the AUA SS were significantly better than in the TURP group up to the second year, and PVR volume values were significantly better throughout all 3 yr of follow-up. In contrast, Q\textsubscript{max} did not differ significantly between the groups at any time. At 3 yr postoperatively, the AUA SS improved 8-fold in the HoLEP and 6-fold in the TURP group. Mean Q\textsubscript{max} increased 5-fold in both groups, and mean PVR volume decreased by 97% in the HoLEP and by 91% in the TURP group.

3.3.2. *Complications*

The adverse events at 3 yr postoperatively are listed in Table 3. There was no statistically significant difference between the two groups (p > 0.05). Reoperations due to late complications (>4 wk after surgery) consisted of only visual urethrotomies and bladder-neck incisions. One HoLEP patient with BPH recurrence refused reoperation because of absence of discomfort. The reoperation rates of HoLEP and TURP patients were 7.2% and 6.6%, respectively (p = 1.0).

3.4. *Dropout*

Table 4 shows the number of patients who continued and discontinued postoperative assessments up to 3 yr of follow-up. The reasons for dropout are listed. Seventy-two percent of the patients completed the 3-yr assessments: 75 patients in the HoLEP group and 69 patients in the TURP group. There was no statistically significant difference in the number of dropouts in the two groups (p > 0.05) at any of the follow-up assessments.
Table 2 – Functional results preoperatively and at follow–up assessments over 36 mo

<table>
<thead>
<tr>
<th>Variables</th>
<th>Preop</th>
<th>1 month postop</th>
<th>6 months postop</th>
<th>12 months postop</th>
<th>18 months postop</th>
<th>24 months postop</th>
<th>36 months postop</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of pts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HoLEP</td>
<td>100</td>
<td>97</td>
<td>94</td>
<td>89</td>
<td>82</td>
<td>80</td>
<td>75</td>
</tr>
<tr>
<td>TURP</td>
<td>100</td>
<td>90</td>
<td>89</td>
<td>86</td>
<td>78</td>
<td>75</td>
<td>69</td>
</tr>
<tr>
<td>AUA SS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HoLEP</td>
<td>22.1 ± 3.8 (13–33)</td>
<td>4.3 ± 2.9 (0–14)</td>
<td>2.2 ± 1.6 (0–9)</td>
<td>1.7 ± 1.8 (0–9)</td>
<td>1.3 ± 1.5 (0–9)</td>
<td>1.7 ± 1.7 (0–9)</td>
<td>2.7 ± 3.2 (0–10)</td>
</tr>
<tr>
<td>TURP</td>
<td>21.4 ± 5.2 (12–32)</td>
<td>5.5 ± 3.8 (0–16)</td>
<td>3.7 ± 3.4 (0–16)</td>
<td>3.9 ± 3.9 (0–19)</td>
<td>4.0 ± 3.8 (0–19)</td>
<td>3.9 ± 3.7 (0–15)</td>
<td>3.3 ± 3.0 (0–15)</td>
</tr>
<tr>
<td>p value</td>
<td>0.56</td>
<td>0.04</td>
<td>0.06</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>0.17</td>
</tr>
<tr>
<td>Qmax (ml/s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HoLEP</td>
<td>4.9 ± 3.8 (0–11)</td>
<td>23.1 ± 7.1 (6–44)</td>
<td>25.1 ± 6.9 (10–49)</td>
<td>27.9 ± 9.9 (5–53)</td>
<td>27.5 ± 9.2 (7–49)</td>
<td>28.0 ± 9.0 (7–49)</td>
<td>29.0 ± 11.0 (6–54)</td>
</tr>
<tr>
<td>TURP</td>
<td>5.9 ± 3.9 (0–12)</td>
<td>25.5 ± 10.7 (8–47)</td>
<td>25.1 ± 9.4 (8–47)</td>
<td>27.7 ± 12.2 (8–56)</td>
<td>28.2 ± 11.2 (9–55)</td>
<td>29.1 ± 10.9 (9–55)</td>
<td>27.5 ± 9.9 (8–50)</td>
</tr>
<tr>
<td>p value</td>
<td>0.08</td>
<td>0.20</td>
<td>0.72</td>
<td>0.76</td>
<td>0.89</td>
<td>0.82</td>
<td>0.41</td>
</tr>
<tr>
<td>PVR (ml)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HoLEP</td>
<td>237 ± 163 (50–1000)</td>
<td>9.4 ± 19.3 (0–100)</td>
<td>4.8 ± 12.5 (0–60)</td>
<td>5.3 ± 15.3 (0–70)</td>
<td>1.6 ± 11.5 (0–100)</td>
<td>5.6 ± 19.9 (0–129)</td>
<td>8.4 ± 16.0 (0–80)</td>
</tr>
<tr>
<td>TURP</td>
<td>216 ± 177 (50–800)</td>
<td>13.2 ± 19.4 (0–85)</td>
<td>16.7 ± 16.9 (0–130)</td>
<td>26.6 ± 60.4 (0–150)</td>
<td>16.3 ± 28.4 (0–140)</td>
<td>19.9 ± 29.6 (0–140)</td>
<td>20.2 ± 33.0 (0–170)</td>
</tr>
<tr>
<td>p value</td>
<td>0.08</td>
<td>0.03</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>&lt;0.012</td>
</tr>
</tbody>
</table>

Preop = preoperative; postop = postoperative; pts = patients; HoLEP = holmium laser enucleation of the prostate; TURP = transurethral resection of the prostate; AUA SS = American Urological Association Symptom Score; Qmax = maximum flow rate; PVR = postvoid residual [urine]; SD = standard deviation.

Data are given as mean ± SD (range).
When the first high-powered holmium lasers became available on the market, a new technology could be used for incision, ablation, resection, and, more recently, enucleation of the human prostate in a relatively bloodless manner. HoLEP appeared to be a promising alternative to TURP to acutely remove obstructing prostatic tissue. We, therefore, started a randomised clinical trial, comparing HoLEP with TURP [6]. The perioperative results clearly favored the HoLEP procedure. HoLEP patients had significantly less blood loss ($p < 0.01$), and none of the HoLEP patients required blood transfusions in contrast to two transfusions in the TURP group. The excellent haemostatic characteristics of the holmium procedure resulted in a significantly shorter median catheter time (1 vs. 2 d, $p < 0.0001$) and median postoperative hospital stay (2 vs. 3 d, $p < 0.0001$). The intraoperative and early postoperative complication rates were lower in the HoLEP group (9.5% vs. 13.3%, $p = 0.08$). HoLEP patients had statistically significantly better outcomes at 1 yr postoperatively, that is, mean AUA SS ($p < 0.0001$) and PVR volume ($p < 0.0001$). These findings are in agreement with Tan et al who reported significantly better desobstruction of the bladder neck as demonstrated by pressure flow studies, when HoLEP was compared with TURP [8,12]. Never before has any other alternative treatment resulted in micturition outcomes superior to TURP. Our randomised clinical trial clearly demonstrated that HoLEP seemed to be the safer and more effective procedure for acute removal of obstructing prostatic tissue, when the postoperative follow-up was short.

We report the 2-yr and 3-yr follow-up results to demonstrate that HoLEP produces durable results. Both HoLEP and TURP significantly improved micturition, as measured by $Q_{\text{max}}$, PVR volume, and AUA SS. However, PVR volume was still significantly smaller in the HoLEP group in all postoperative assessments, up to 3 yr. (Although these differences were not clinically relevant, since the mean PVR volume in TURP patients never exceeded 30 ml). The AUA SS were significantly lower in HoLEP patients up to 2 yr of follow-up. A possible explanation for the better outcome of HoLEP could be the more extensive removal of adenomatous tissue. TURP is often not extended down to the fibres of the capsule in fear of capsular perforation and severe venous bleeding. The statistically significant difference in the AUA SS dissipated after 3 yr. This finding might be due to the prospective study design and decrease of patient sample sizes over time.

In HoLEP, the tip of the fibre mimics the tip of the surgeon’s index finger during open prostatectomy, and the adenoma is completely peeled off the surgical capsule. Not surprisingly, a randomised trial comparing HoLEP with open prostatectomy proved that the amount of tissue removed was identical in both groups, as well as micturition improvements [13]. Therefore, in large glands, HoLEP proved to be a true endourologic alternative to open prostatectomy [13–15], since both enuclea-

### Table 3 – Incidence of late complications following HoLEP/TURP after complete follow-up at 36 mo

<table>
<thead>
<tr>
<th>Complication</th>
<th>HoLEP (%)</th>
<th>TURP (%)</th>
<th>$p$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urethral stricture</td>
<td>4 (4.1%)</td>
<td>3 (3.3%)</td>
<td>1.0</td>
</tr>
<tr>
<td>Bladder-neck contracture</td>
<td>3 (3.1%)</td>
<td>3 (3.3%)</td>
<td>1.0</td>
</tr>
<tr>
<td>BPH recurrence</td>
<td>1 (1.0%)</td>
<td>0 (0%)</td>
<td>1.0</td>
</tr>
<tr>
<td>Total no. (%)</td>
<td>8 (8.2%)</td>
<td>6 (6.6%)</td>
<td>0.9</td>
</tr>
</tbody>
</table>

HoLEP = holmium laser enucleation of the prostate; TURP = transurethral resection of the prostate; BPH = benign prostatic hyperplasia.

### Table 4 – Lost or excluded patients (dropouts) over 36 mo of follow-up

<table>
<thead>
<tr>
<th>Lost or excluded cases</th>
<th>HoLEP (n = 100)</th>
<th>TURP (n = 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 month postoperative</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Incidental pCA</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>6 months postoperative</td>
<td>97</td>
<td>90</td>
</tr>
<tr>
<td>Urethral stricture</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>12 months postoperative</td>
<td>94</td>
<td>89</td>
</tr>
<tr>
<td>Refused follow-up</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>BNC</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>18 months postoperative</td>
<td>89</td>
<td>86</td>
</tr>
<tr>
<td>Refused follow-up</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Moved away</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Polymorbidity</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Death</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>24 months postoperative</td>
<td>82</td>
<td>78</td>
</tr>
<tr>
<td>Refused follow-up</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>BNC</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Transition cell carcinoma</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Death</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>36 months postoperative</td>
<td>80</td>
<td>75</td>
</tr>
<tr>
<td>Refused follow-up</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Moved away</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Polymorbidity</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>BPH recurrence</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>BNC</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Urethral stricture</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Death</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>No. of patients</td>
<td>75</td>
<td>69</td>
</tr>
<tr>
<td>Total no. of dropouts</td>
<td>25</td>
<td>31</td>
</tr>
</tbody>
</table>

HoLEP = holmium laser enucleation of the prostate; TURP = transurethral resection of the prostate; pCA = prostate cancer; BNC = bladder-neck contracture; BPH = benign prostatic hyperplasia.
tion techniques resulted in an identically open prostatic cavity.

However, it must be noted that, in our study, \( Q_{\text{max}} \) never differed significantly between the HoLEP and TURP groups at any postoperative assessment. Postoperative urodynamic pressure flow studies were not performed in our trial. Thus, it remains unclear, why the two groups had similar postoperative \( Q_{\text{max}} \) and significantly different PVR volume values. Nevertheless, HoLEP obviously produces micturition outcomes at least as good as TURP up to 3 yr postoperatively.

One of the main advantages of TURP compared with minimal-invasive alternative techniques has been the proven durability of micturition improvement, which is reflected in a low reoperation rate of 1.8% per year [16] or 12–15.5% after 8 yr [17].

In our clinical trial, the rate of urethral strictures was similar in the HoLEP and TURP groups at 3 yr postoperatively (4.1 vs. 3.3%, \( p = 1.0 \)). Gilling and coworkers also reported no statistically significant difference in urethral stricture rates when comparing HoLEP with TURP [8,18]. Madersbacher and Marberger [5] reviewed 29 randomised trials of TURP (1480 patients) versus less-invasive treatment modalities (1552 patients), and reported a mean stricture rate of 3.8% for TURP. The majority of TURP series report stricture rates of 3.1–5.6% [3]. Although in our study HoLEP took 20 min longer than TURP, the longer operation time obviously did not increase the risk for stricture formation. This finding was also indicated by the low urethral stricture rate of HoLEP (1.7–2.3%) for large glands of more than 100 g [13,19].

In our trial, the rate of postoperative bladder-neck contracture (BNC) was similar in both groups: 3.3% in the TURP group, and 3.1% in the HoLEP group (\( p = 1.0 \)). These rates were in the same range as those reported elsewhere in the literature [20,21]. In the HoLEP group, all three BNCs became clinically evident within the first 6 mo after surgery, whereas in the TURP group BNCs were diagnosed 8, 18, and 36 mo postoperatively. This is the reason why the incidence of BNC was only 1.1% in our previous article reporting the 12-mo follow-up results, but is 3.1% in our report on 3-yr follow-up results. The overall reoperation rates in the HoLEP and TURP groups after 3 yr of follow-up were similar (7.2 vs. 6.6%, \( p = 1.0 \)).

Our study is so far the largest randomised trial comparing HoLEP and TURP, but of course it is not devoid of limitations. When we started our study, the tissue morcellator was not yet available, and the subtotally enucleated lobes were fragmented in a time-consuming way by using the conventional TURP technique, after changing the irrigation fluid from saline to electrolyte-free solution. The tissue-morcellating devices of today significantly improve the speed of tissue removal [22–24]. This aspect could not be reflected, in either our report on short-term results or this report on long-term results.

The cost-effectiveness of HoLEP is a complex issue and was previously discussed in detail [6].

Apparently, the learning curve seems to be the major drawback of HoLEP and has been frequently blamed for the yet limited clinical application of HoLEP worldwide. Certainly HoLEP is not easy to learn and, similar to TURP, endoscopic skills are essential. However, our experience with more than 2000 holmium procedures and training residents and visiting urologists suggests that the learning curve of HoLEP is not longer but probably shorter than that of TURP, mainly because of the excellent visibility throughout the whole procedure. Sometimes it might be more challenging for an experienced surgeon who feels comfortable with his traditional TUR technique to adapt to a new procedure, than for a novice. It is generally agreed and consistent with our experience that about 30 patients are required for a urologist familiar with transurethral surgery to feel reasonably safe performing HoLEP of small- and medium-sized prostates [15,22,25].

The learning curve should not deter urologists from using HoLEP as surgical treatment for BPO. For all urologists who manage to complete the learning curve, HoLEP has doubtless made TURP and open prostatectomy operations of the past.

Recently, potassium titanyl phosphate (KTP) laser vaporization of the prostate has been vigorously marketed as a safe and effective technique to acutely ablate obstructing prostatic tissue. To our knowledge, a peer-reviewed article on a completed randomised clinical trial comparing KTP laser vapourisation and TURP has not yet been published (only a preliminary report of Bouchier-Hayes et al [26] is available), and long-term follow-up data on a large number of patients are not existing [9,22]. A prospective but nonrandomised comparative study of 64 KTP patients versus 37 TURP patients could not prove that KTP laser was less invasive than TURP. KTP caused less severe bleeding (0%), but resulted in higher rate of urinary retentions (7.8%) and urethral strictures (7.8%). Furthermore, the overall peri-operative morbidity of KTP and TURP was similar.

The authors conclude that randomised trials with long-term follow-up are warranted to evaluate the future role of the KTP laser in the instrumental treatment of BPH [27]. Furthermore, in contrast to TURP and HoLEP, KTP laser vapourisation does not provide tissue specimen for histologic evaluation,
the speed of tissue ablation is significantly slower, and the postoperative reduction in PSA and volume is significantly less [22].

5. Conclusions

After 3 yr of follow-up, HoLEP micturition outcomes compare favourably with TURP. Late complications are equally low. HoLEP may be a real alternative to TURP.

Conflicts of interest

On behalf of the authors, we deny any commercial relationship such as stock ownership or other equity interests, patents received and/or pending, or any commercial relationship that might be in any way considered related to the submitted article.

Professor Kuntz is a consultant for the companies Lumenis and Karl Storz.

References

The authors, who have the greatest experience in this field in Europe, are to be commended for their prospective randomised trial reporting on medium-term follow-up data of patients with bladder outlet obstruction due to benign prostate hyperplasia (BPH) submitted to either holmium laser enucleation of the prostate (HoLEP) or transurethral resection of the prostate (TURP) [1]. They demonstrated that at 3-yr follow-up HoLEP provided a significant subjective and objective improvement in micturition comparable to that of TURP, with a similar overall reintervention rate.

This article should be read together with the previous short-term analysis of the study [2] and the comprehensive review on the role of lasers in the active treatment of BPH by the same senior author [3]. Albeit evidence has now accumulated showing that HoLEP is associated with a similar short-term functional outcome as TURP or even open prostatectomy for larger glands, and with a lower perioperative morbidity [3], long-term data are still lacking. However, because HoLEP does, by definition, include the removal of the whole obstructing prostatic tissue, one may reasonably expect the good early functional results reported to be confirmed in long-term analyses. The anticipated 5-yr follow-up analysis of the present series, especially focusing on late complication and overall reoperation rates, is eagerly awaited, but the durability of HoLEP must be reproduced in a prospective randomised fashion by other groups as well before this minimally invasive technique can be regarded as the real alternative to the “gold standard” TURP.

In my opinion, the two most debated drawbacks, which at the beginning may have limited the spread of HoLEP in the urologist community, namely, the learning curve and cost, are, indeed, not entirely justified. As for the former, it is a fact that the young urologists are more likely to be exposed to endoscopic than to open or laparoscopic surgery training both in academic and nonacademic centres, thus they should be more confident with this “new” modality when starting their approach to it. The second one, albeit a more complex issue, may be overcome, when considering that holmium laser may even spare the costs of the higher early morbidity of TURP [4] and may be used for different urologic conditions other than BPH treatment [3].

In conclusion, HoLEP is no more a simple promise, but a growing certainty.

References


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Holmium laser enucleation of the prostate (HoLEP) has been proposed as an alternative to transurethral resection of prostate (TURP) or open prostatectomy (OP) for patients with lower urinary tract symptoms (LUTS) due to large or extremely large prostates. The current role of HoLEP in the treatment of benign prostatic hyperplasia (BPH) is based on the results of about 10 randomised controlled trials (RCTs) published by six centres of excellence [1].

Available RCTs showed that HoLEP was associated with lower blood loss and shorter duration of catheterisation and length of hospitalisation compared with TURP [2,3] and OP [4]. At the 24-mo follow-up, patients treated by HoLEP experienced outcomes equivalent or superior to those who had undergone TURP or OP in terms of symptom scores (International Prostate Symptom Score or American Urological Association Symptom Index) and postoperative urine flow (Qmax). Moreover, the longer operating room time required to perform the HoLEP seemed to be balanced by a greater amount of prostate tissue retrieved per unit of time in comparison with TURP [1].

The paper published by Ahyai et al in the present issue of European Urology is an intermediate analysis of the 3-yr follow-up results of an ongoing RCT comparing HoLEP versus TURP [2,5]. To date, this is the study with the longest follow-up and the data confirmed that the functional outcomes after HoLEP overlapped those observed in the TURP arm also beyond 24-mo follow-up. Moreover, long-term complications were equally low in both arms. Only the mean value of the postvoid residual (PVR) was statistically lower in the study group. However, these data cannot be regarded as clinically relevant considering that the mean values of PVR after 36 mo were <50 ml in both groups.

In our opinion, the results of this study reconfirm the real role of HoLEP as the main alternative to traditional surgery in the treatment of patients with LUTS due to BPH. However, it is necessary to remember that the definitive results are awaited at the 5-yr follow-up according the initial protocol [2].

The favourable results coming from RCTs allow us to hypothesise that the number of physicians performing HoLEP will increase in the coming years. Considering that the main drawback of HoLEP seems to be represented by the long learning curve [1], the definitive success of this technique will be strongly related to the quality of training programs (live demonstrations and tutoring/mentoring). On the other hand, the excellent results reported in the RCTs performed in centres of excellence will not be reproduced in community hospitals.

References


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