

1 Change of Sexual Function in Patients Before and After Ho:YAG Laser

2 Enucleation of the Prostate

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8 Running title: Change of Sexual Function Before and After HOLEP

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10 Abbreviation: HOLEP, Ho:YAG laser enucleation of the prostate; BPH, benign
11 rostatic hyperplasia; DanPSS Sex, Danish Prostate Symptom Score Sexual Function
12 Questionnaire; TURP, transurethral resection of the prostate; IPSS, the International
13 Prostate Symptom Score; Qmax, maximum flow rate

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Abstract

44 **Aim:** To evaluate the effect of Ho:YAG laser enucleation of the prostate (HOLEP) to
45 the sexual function of patients with benign prostatic hyperplasia (BPH). **METHODS:**
46 108 patients with BPH were recruited and accepted the treatment of HOLEP. The
47 effectiveness of treatment was evaluated by flow rate and the International Prostate
48 Symptom Score (IPSS) before HOLEP and 6 months afterwards. Meanwhile, the
49 sexual functions were evaluated with the Danish Prostate Symptom Score Sexual
50 Function Questionnaire (DanPSS Sex). **Results:** Before and 6 months after HOLEP
51 treatment, the mean residual urine volume was reduced from 106.0 ± 51.7 ml to
52 5.6 ± 1.7 ml ($P < 0.01$). maximum flow rate (Q_{max}) was improved from 7.2 ± 3.9 ml/s to
53 21.7 ± 1.3 ml/s ($P < 0.01$), nocturia frequency was reduced from 5.5 to 1.5 ($P < 0.01$), the
54 mean IPSS score was decreased from 19.4 ± 5.6 to 7.4 ± 2.6 ($P < 0.01$). The proportion of
55 patients satisfied with their libido were 55% before HOLEP and 57% 6 months
56 afterwards, while 23.5% of the patients have no libido before and after HOLEP. 37% of
57 the patients were satisfied with their erection before HOLEP and 40% were after 6
58 months. 30% of the patients had completely satisfactory sex life before HOLEP, and
59 32% did 6 months later. The corresponding percentages of fully impotent patients
60 increased from 33% before the procedure to 35% 6 months post operation. Early
61 morning erections were reported by 45% of the patients before the procedure, and by
62 62% 6 months later ($P < 0.01$). In 70% of the patients with normal sex life ejaculation
63 was retrograde 6 months after HOLEP ($P < 0.01$). **Conclusion:** HOLEP does not affect
64 the sexual function of patients with BPH but does did improve the ability of early
65 morning erection, and caused retrograde ejaculation.

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Introduction

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89 Recently, studies(Namasivayam et al,1998;Baniel et al,2000) have indicated the
90 correlation between lower urinary tract symptom caused by benign prostatic
91 hyperplasia and some aspects of sexual problems. 44.2% of the patients with severe
92 urinary symptoms had unsuccessful coitus, compared to 13.1% of the patients with
93 milder dysfunction (Baniel et al,2000). The study further identified the correlation
94 between lower urinary tract symptoms and other sexual dysfunctions, including
95 ejaculation disorders, a decreased sexual desire, and a diminished satisfaction (Burger
96 et al,1999).

97 Ho:YAG laser enucleation of the prostate (HOLEP) is a new and promising
98 technique for the resection of prostatic tissue(Chepurov,1999; Elzayat et al,2005; Kim
99 et al,2005).Ho:YAG laser technique possesses unique characteristics such as narrow
100 range of hot injury (only 0.5 1.0mm) and good hematischesis. Ho:YAG laser
101 technique enable to control the operating area clean, and to reduce the chance to break
102 through the prostatic surgery membrane. Ho:YAG laser rarely hurt the erectile nerve or
103 penial blood vessel. HOLEP provides quick alleviation of symptoms and has been
104 proven to be safe. It may, however, have some side effects, of those the disturbances of
105 sexual function was most suspected. To evaluate the effect of HOLEP on the sexual
106 function, studies have been conducted and the results are reported below.

107 Patients and methods

108 The primary study population includes 108 patients with benign prostatic
109 hyperplasia (BPH) for at least (or about) two years in Qilu Hospital of Shandong
110 University and Shandong Province Hospital. The mean age of the patients was 69.2
111 years old, ranging from 54 to 82 years. The mean prostatic volume detected by
112 transrectal sonography was 50.8cm³, ranging from 15.0 to 106.0 cm³. Patients have
113 been asked about their medical history. The investigation showed that 11% of the
114 patients suffered from diabetes, 14% suffered from hyperpiesia. 33% of the patients
115 reported smoking, while 43% had history of frequent use of alcohol. About 27% of the
116 patients lived alone. Only 3% out of the 108 patients had been treated by
117 pharmacotherapy for impotence before HOLEP.

118 The patients were treated with Ho: YAG laser enucleation of the prostate
119 (HOLEP). The laser energy was applied directly to the prostatic tissue by using a
120 standard 550 micron end-firing fiber. The mean weight of the enucleated prostate
121 tissue in HOLEP was 31.7 g, ranging from 12 to 102g. By analysis of the tissue,
122 definite pathologic diagnosis was conducted.

123 The effectiveness of treatment was evaluated by flow rate and the International
124 Prostate Symptom Score (IPSS) before HOLEP and 6 months afterwards. Each patient
125 has also filled in the DanPSS Sex questionnaires before the HOLEP treatment and 6
126 months after the HOLEP treatment. The questionnaire consisted of 22 items, including
127 patients' general health, libido, satisfaction with their current sex life, occurrence of
128 early morning erections, coital frequency, sexual potency, satisfaction with erection
129 and ejaculation, percentage of successful intercourse, and the possible impairing effect

130 of the procedure on potency. The patients completed the same questionnaire 6 months
131 after HOLEP. The SPSS 11.0 method was applied to analyze and compare data.

132 **Results**

133 As shown in the table 1, before and 6 months after HOLEP treatment, the mean
134 residual urine volume was reduced from 106.0 ± 51.7 ml to 5.6 ± 1.7 ml ($P < 0.01$). Qmax
135 was improved from 7.2 ± 3.9 ml/s to 21.7 ± 1.3 ml/s ($P < 0.01$), nocturia frequency was
136 reduced from 5.5 to 1.5 ($P < 0.01$), the mean IPSS score was decreased from 19.4 ± 5.6 to
137 7.4 ± 2.6 ($P < 0.01$).

138 As shown in figure 1 to figure 4, the questionnaire data indicated the
139 percentage of patients satisfied with their sex life was 30% before the HOLEP
140 treatment versus 32% after the treatment (figure 1). The satisfactory libido changed
141 from 55% to 57% after the HOLEP treatment, while 23.5% of the patients had no
142 libido before and after HOLEP treatment (figure 2). The percentage of the patients
143 satisfied with their erection increased slightly from 37% to 40% after HOLEP
144 treatment, the same as the percentages of fully impotent patients from 33% to
145 35% (figure 3). No noticeable change was observed for the orgasm rate (76 % to
146 70%) (figure 4). Significant change was observed for early morning erections, which
147 increased from 45% to 62% ($P < 0.01$), and for the ejaculation rate, 21% of patients felt
148 pain or discomfort on ejaculation. among 70% of the patients ejaculation was
149 retrograde 6 months after HOLEP ($P < 0.01$).

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152 **DISCUSSION**

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154 According to the results above, patients' erection showed no noticeable change;
155 it proves that HOLEP have fewer side effects on erection activity. But the HOLEP
156 could affect sexual function in other ways which were divided into two categories:
157 psychogenic and physiologic effect. Psychogenically, patients could be affected
158 negatively due to worrying about the invasive procedure; physiologically, patients
159 could be affected by the injury of urethra due to feeling pain during erection.

160 The erection ability of some patients seemed improved: 15% of patients reported
161 that they had better early morning erections than before. Studies (Pekka et al, 1998;
162 Mishriki et al, 2001) also reported the similar phenomenon after transurethral resection
163 of the prostate (TURP). Our data indicate that the change most likely attributes to the
164 improvement of the quality of sleep due to the reduction of nycturia frequency (table 1).
165 The survey showed that when patients experienced difficulty of urination caused by
166 BPH, they would prefer to avoid suffering from this disease by stopping pursuing the
167 sex. Subsequently, their libido will keep in a comparatively low state. After HOLEP
168 treatment, dysuresia vanished. As the result, the pressure above was released, the
169 libido became normal, and the patients felt that their erection ability improved.

170 Meanwhile, 70% of the patients were often troubled by retrograde ejaculation
171 after the HOLEP treatment, but their satisfaction with their orgasm remain unchanged.
172 The major reason is that the internal sphincter in the neck of bladder was injured and
173 can not block semen flowing into the bladder (Dunsmuir et al, 1996; Libman and
Fichten, 1987; Tuhkanen et al, 2004).

174 In summary, the effect of Ho:YAG laser enucleation of the prostate (HOLEP) on
175 the sexual function has been studied. The Ho:YAG laser enucleation of the prostate
176 does not affect the sexual functions of the patient significantly but does did improve
177 the ability of early morning erection, and caused retrograde ejaculation, which has no
178 particularly effect on orgasm.

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181 Hospital of Shandong University.

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219 Figure 1 shows the proportions of the patients' degree of satisfaction with their sex life
220 before and 6 months after HOLEP. There are no significant difference between
221 groups($P>0.05$).

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223 Figure 2 shows the findings on libido before HOLEP and 6 months later. 55% of the
224 patients reported normal libido before HOLEP, while 57% did after 6 months
225 ($P>0.05$).

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227 Figure 3 presents data of erection before and 6 months after HOLEP. Only 37% of the
228 patients had satisfactory erections before HOLEP, but 40% of the patients reported
229 satisfactory erection after 6 months. Still, there were 33% of the patients who had no
230 erection before and 35% were 6 months later. HOLEP appeared to have no significant
231 effect on erection. Early morning erections were reported by 45% of the patients before
232 the procedure, and by 62% 6 months later. The difference before and after HOLEP was
233 significant ($P<0.01$).

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235 Figure 4 shows experience of orgasm before and 6 months after HOLEP. Orgasm was
236 experienced during intercourse in half or more than half of the occasions by 76% of the
237 patients before the procedure, and by 70% 6 months afterwards($P>0.05$).

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Table 1 change of patients before HOLEP and 6 months later

	IPSS score	Qmax flow rate(ml/s)	residual urine(ml)	nocturia frequency
before HOLEP	19.4±5.6	7.2±3.9	106.0±51.7	5.5
after HOLEP	7.4±2.6*	21.7±1.3*	5.6±1.7*	1.5*

note: * $P < 0.01$.

Fig.1 Satisfaction with sex life in 108 BPH patients before HOLEP and 6 months later

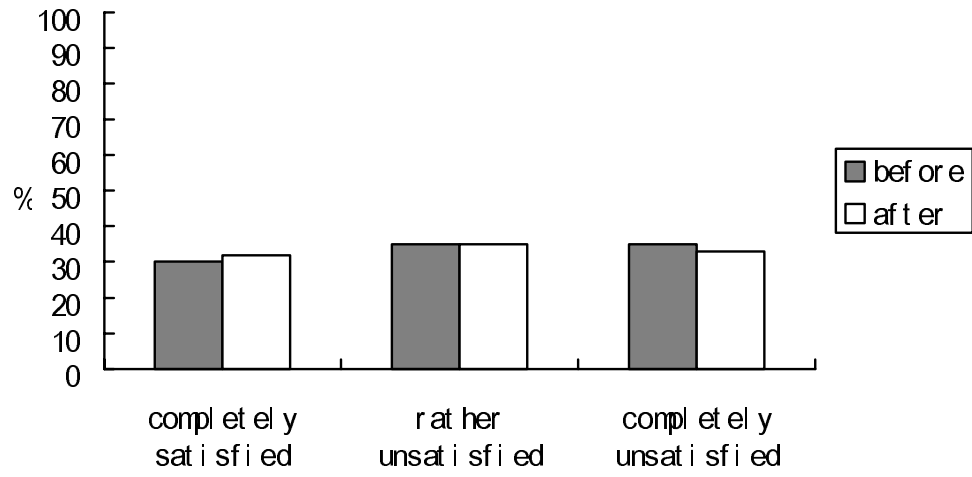


Fig.2 Libido in 108 BPH patients before HOLEP and 6 months later

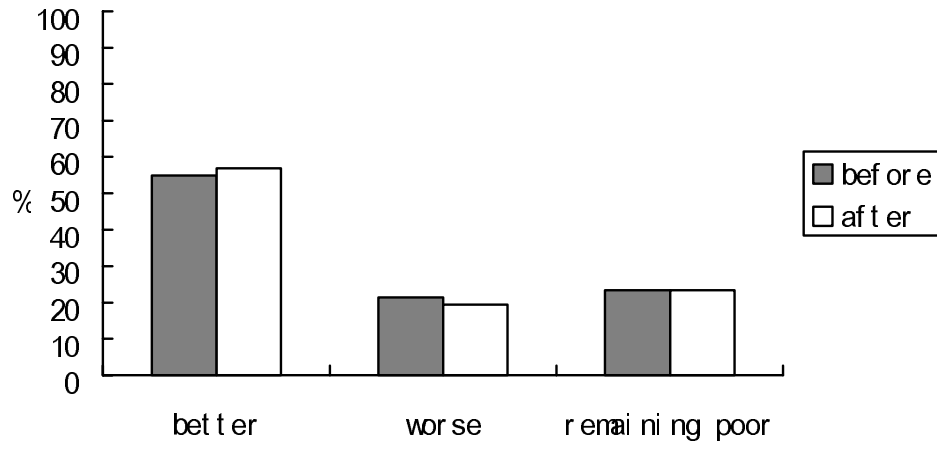


Fig.3 Erection in 108 BPH patients before HOLEP and 6 months later

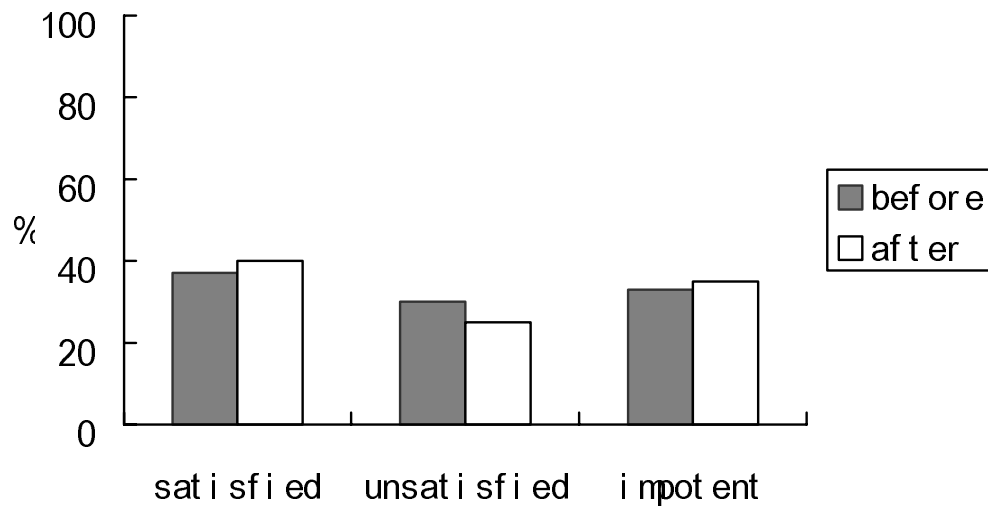


Fig.4 Orgasm in 108 BPH patients before HOLEP and 6 months later

