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July 2022 Journal Club #2

Urology

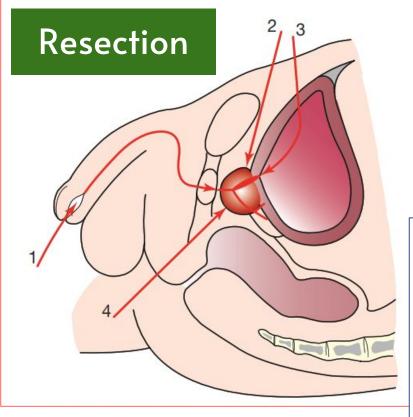
Efficacy and Safety of
Enucleation vs. Resection of
Prostate
for Treatment of
Benign Prostatic Hyperplasia



Springer Nature - Prostate Cancer & Prostatic Diseases

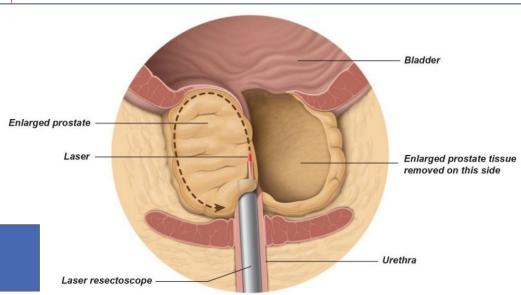
Published: 28 February 2019





Various ways to approach prostate:

- 1 = Transurethral (TURP)
- 2 = Retropubically (RPP)
- 3 = Through the bladder (Transcervical, TVP)
- 4 = From the perineum



Enucleation





Aim of Study

Compare the **Efficacy** and **Safety** of

Transurethral Enucleation

and

Resection of Prostate

for Treatment of Benign Prostatic

Hyperplasia (BPH)

METHODOLOGY

Ol. Data Sources

Note: Quality assessment of included studies in the meta-analysis was measured by using the Cochrane System!

"Prostate"

"Resection"

"Enucleation"









WEB OF SCIENCE



METHODOLOGY



03.

RESULTS

- Study Characteristics
- Quantitative Data Synthesis
- Safety Outcomes



2 Types of outcome

Efficacy outcome

- IPSS
- Qmax
- Quality of life (QoL)

Safety outcomes

- Perioperative outcomes
 - Hemoglobin loss
 - Operative time
 - Hospital stay
 - Blood transfusion
- International Index of Erectile Function-5 (IIEF-5)
- Clavien classification of surgical complications
- Early and late complication

The international Prostate Symptom Score (IPSS)

- Measures the severity of lower urinary tract symptoms.
- It is used to assess disease severity and response to therapy.
- Made up of 7 questions related to voiding

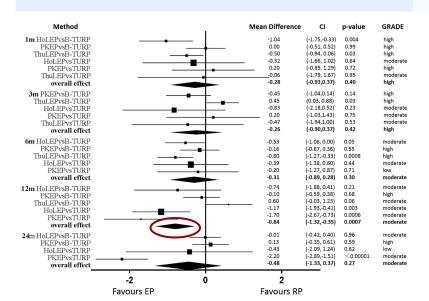
Scoring

0-7	Mild symptoms
8-19	Moderate symptoms
20-35	Severe symptoms

	Over the past month, now often have you had a sensation of not emptying your bladder completely after you finished urinating?
	O Not at all (0 points)
	O Less than 1 time in 5 (1 point)
	Less than half the time (2 points)
	 About half the time (3 points)
	More than half the time (4 points)
	Almost always (5 points)
	Over the past month, how often have you had to urinate again less than 2 hours after you finished urinating?
	O Not at all (0 points)
	O Less than 1 time in 5 (1 point)
	Less than half the time (2 points)
	O About half the time (3 points)
	More than half the time (4 points)
	O Almost always (5 points)
	Over the past month, how often have you found you stopped and started again several times when you urinated?
	O Not at all (0 points)
	O Less than 1 time in 5 (1 point)
	O Less than half the time (2 points)
	O About half the time (3 points)
	O More than half the time (4 points)
	Almost always (5 points) Over the past month, how often have you found it difficult to postpone urination?
	O Not at all (0 points)
	O Less than 1 time in 5 (1 point)
	O Less than half the time (2 points)
	O About half the time (3 points)
	More than half the time (4 points)
	O Almost always (5 points)
	Over the past month, how often have you had a weak urinary stream?
	O Not at all (0 points)
	O Less than 1 time in 5 (1 point)
	O Less than half the time (2 points)
	O About half the time (3 points)
	More than half the time (4 points)
	O Almost always (5 points)
	Over the past month, how often have you had to push or strain to begin urination?
	O Not at all (0 points)
	O Less than 1 time in 5 (1 point)
	O Less than half the time (2 points)
	 About half the time (3 points)
	O More than half the time (4 points)
	O Almost always (5 points)
C	over the past month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the morning?
	O None (0 points)
	O 1 time (1 point)
	O 2 times (2 points)
	O 3 times (3 points)
	O 4 times (4 points)
	O 5 or more times (5 points)

The international Prostate Symptom Score (IPSS) was measured at 1, 3, 6, 12 and 24 months post-operation

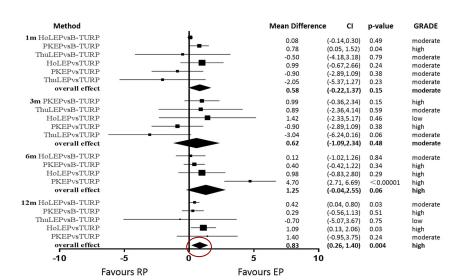
Outcome: Mean difference of IPSS score between enucleation and resection of prostate



1 month	No significant difference			
3 months	No significant difference			
6 months	No significant difference			
12 months	Lower IPSS score in enucleation Mean diff. → -0.84 [-1.32,-0.35]			
24 months	No significant difference			

Maximum urinary flow rate (Qmax)

Outcome: Mean difference of maximum urinary flow rate between Enucleation and resection of prostate



1, 3 & 6 months:

No significantly difference

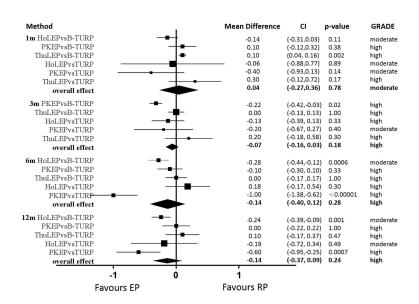
12 month:

Qmax was greater in enucleation group than in resection group

 \rightarrow 0.83ml/s [0.26,1.40]

Quality of life (QoL)

Outcome: Mean difference of quality of life (QoL) between Enucleation and resection of prostate



No significant difference between QoL at 1, 3, 6, and 12 months

Perioperative data

Outcome	Results
Operative time	Enucleation (Longer) → 11.14min [5.51,16.78]
Hospital stay	Enucleation (Shorter) → -22.11h [-28.87, -15.36]
Hemoglobin loss	Enucleation (Lesser) → -0.62g/dl [-0.81, -0.43]
Serum sodium decrease	Enucleation (Lesser) → -0.68mmol/L [-1.15, -0.22]

Table 3 Perioperative data

2	Studies	No. of patients	Pooled estimate	p	I ² (%)	GRADE
Operative time	HoLEP vs. TURP	459/455	15.51 [9.29, 21.72]	< 0.00001	83	High
	HoLEP vs. B-TURP	230/230	24.13 [14.11, 34.16]	< 0.00001	78	High
	PKEP vs. B-TURP	332/334	-4.11 [-10.73, 2.52]	0.22	89	High
	ThuLEP vs. B-TURP	181/185	5.08 [- 20.37, 30.53]	0.70	97	High
	DiLEP vs. TURP	74/52	5.20 [- 8.41, 18.81]	0.45	NA	Moderate
	PKEP vs. TURP	102/102	12.60 [8.70, 16.50]	< 0.00001	NA	High
	ThuLEP vs. TURP	54/52	27.70 [15.66, 39.74]	< 0.00001	NA	High
	Overall effect	1432/1410	11.14 [5.51, 16.78]	0.0001	94	High
Hospital stay	HoLEP vs. TURP	426/442	- 24.34 [- 35.81, - 12.86]	< 0.0001	99	High
	HoLEP vs. B-TURP	170/170	- 9.02 [- 29.34, 11.30]	0.38	96	Moderate
	PKEP vs. B-TURP	290/290	- 16.22 [- 29.53, - 2.91]	0.02	95	High
	ThuLEP vs. B-TURP	181/185	- 65.72 [- 98.52, - 32.92]	< 0.0001	86	High
	DiLEP vs. TURP	74/52	- 16.80 [- 27.01, - 6.59]	0.001	NA	Moderate
	PKEP vs. TURP	102/102	- 35.80 [- 43.08, - 28.52]	< 0.00001	NA	Moderate
	ThuLEP vs. TURP	83/82	2.02 [- 5.11, 9.16]	0.58	0	Moderate
	Overall effect	1326/1303	- 22.11 [- 28.87, - 15.36]	< 0.00001	98	Moderate
Hemoglobin loss	HoLEP vs. TURP	446/442	-0.46 [-0.76, -0.17]	0.002	71	High
	HoLEP vs. B-TURP	210/210	-0.46 [-0.85, -0.07]	0.02	84	high
	PKEP vs. B-TURP	177/179	-0.59 [-0.80, -0.39]	< 0.00001	71	High
	ThuLEP vs. B-TURP	181/185	- 1.25 [- 3.44, 0.93]	0.26	99	Moderate
	PKEP vs. TURP	102/102	- 1.14 [- 1.36, - 0.92]	< 0.00001	NA	High
	ThuLEP vs. TURP	83/82	- 0.47 [- 1.31, 0.37]	0.27	83	Moderate
	Overall effect	1199/1200	-0.62 [-0.81, -0.43]	< 0.00001	94	Moderate
Serum sodium decrease	HoLEP vs. TURP	304/304	- 1.45 [- 2.37, - 0.54]	0.002	70	High
	HoLEP vs. B-TURP	230/230	-0.16 [-0.50, 0.17]	0.34	0	High
	PKEP vs. B-TURP	95/95	- 0.08 [- 2.82, 2.66]	0.95	94	Low
	ThuLEP vs. B-TURP	102/106	-0.01 [-0.12, 0.10]	0.86	NA	High
	PKEP vs. TURP	102/102	-0.31 [-0.56, -0.06]	0.02	NA	Moderate
	ThuLEP vs. TURP	29/30	- 1.30 [- 2.43, - 0.17]	0.02	NA	High
	overall effect	862/867	-0.68 [-1.15, -0.22]	0.004	92	Moderate

B-TURP bipolar transurethral resection of the prostate, DiLEP diode laser enucleation of the prostate, GRADE grading of recommendation assessment, development, and evaluation system, HoLEP holmium laser enucleation of the prostate, NA not available, PKEP plasma kinetic enucleation of prostate, ThuLEP thulium laser enucleation of the prostate, TURP transurethral resection of the prostate.

International Index of Erectile Function-5 (IIEF-5)

Self-report instrument for the evaluation of male sexual dysfunction.

C	ver the past six months:					
1	How do you rate your confidence that you could get and keep an erection?	Very low	Low	Moderate	High	Very high
		1	2	3	4	5
2	When you had erections with sexual stimulation, how often were your erections hard enough for penetration?	Almost never/never	A few times (much less than half the time)	Sometimes (about half the time)	Most times (much more than half the time)	Almost always/always
		1	2	3	4	5
3	During sexual intercourse, how often were you able to maintain your erection after you had penetrated (entered) your partner?	Almost never/never	A few times (much less than half the time)	Sometimes (about half the time)	Most time (much more than half the time)	Almost always/always
		1	2	3	4	5
4	During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse?	Extremely difficult	Very difficult	Difficult	Slightly difficult	Not difficult
	53	1	2	3	4	5
5	When you attempted sexual intercourse, how often was it satisfactory for you?	Almost never/never	A few times (much less than half the time)	Sometimes (about half the time)	Most times (much more than half the time)	Almost always/always
		1	2	3	4	5

International Index of Erectile Function (IIEF-5)

Outcome: Mean difference of IIEF-5 score between enucleation and resection of prostate

No significant difference between enucleation and resection of prostate at 6, 12 and 24 months

Efficacy and safety of enucleation vs. resection of prostate for treatment of benign prostatic...

Table 2 IIEF-5 at 6, 12, and 24 months postoperatively and complication classification

	Studies	No. of patients	Pooled estimate	p	12 (%)	GRADE
IIEF-5 6m	HoLEP vs. B-TURP	50/44	-0.11 [-1.23, 1.01]	0.85	NA	Low
	PKEP vs. B-TURP	40/40	0.60 [-0.66, 1.86]	0.35	NA	Moderate
	HoLEP vs. TURP	124/120	0.12 [- 0.47, 0.72]	0.68	0	Moderate
	PKEP vs. TURP	102/102	0.20 [- 1.43, 1.83]	0.81	NA	Low
	Overall effect	316/306	0.16 [-0.31, 0.62]	0.51	0	Low
IIEF-5 12m	PKEP vs. B-TURP	40/39	0.22 [-1.04, 1.48]	0.73	NA	Moderate
	HoLEP vs. TURP	198/197	0.08 [- 0.47, 0.63]	0.78	0	High
	PKEP vs. TURP	102/102	- 1.60 [- 3.44, 0.24]	0.09	NA	Moderate
	Overall effect	340/338	- 0.02 [- 0.50, 0.47]	0.94	0	Moderate
IIEF-5 24m	HoLEP vs. B-TURP	50/44	0.02 [- 0.05, 0.09]	0.56	NA	Moderate
	PKEP vs. B-TURP	39/37	- 0.15 [- 1.59, 1.29]	0.84	NA	Low
	HoLEP vs. TURP	132/132	0.07 [- 0.50, 0.64]	0.82	0	High
	PKEP vs. TURP	91/89	0.10 [- 1.35, 1.55]	0.89	NA	Low
	Overall effect	312/302	0.02 [- 0.05, 0.09]	0.54	0	Low

50

Clavien-Dindo classification (CDC)

- Standardized system for the registration of surgical complications
- The severity of a complication is graded based on the type of therapy required to treat the complication

Grade	
1	Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic and radiological interventions. Acceptable therapeutic regimens are: drugs as antiemetics, antipyretics, analgetics, diuretics and electrolytes and physiotherapy.
2	This grade also includes wound infections opened at the bedside. Requiring pharmacological treatment with drugs other than such allowed for grade I complications. Blood transfusions, antibiotics and total parenteral nutrition are also included.
3	Requiring surgical, endoscopic or radiological intervention
3a	Intervention under regional/local anesthesia
3b	Intervention under general anesthesia
4	Life-threatening complication requiring intensive care/intensive care unit management
4a	Single organ dysfunction
4b	Multi-organ dysfunction
5	Patient demise

Clavien-Dindo classification (CDC)

Complications of **grade II and III** occured less in enucleation group **Grade II** \rightarrow 0.61 [0.38, 0.97]; 1.64 times **Grade III** \rightarrow 0.54 [0.35, 0.83]; 1.85 times

Overall frequencies of **grade I and IV** complications did **not significantly** differ between enucleation and resection groups

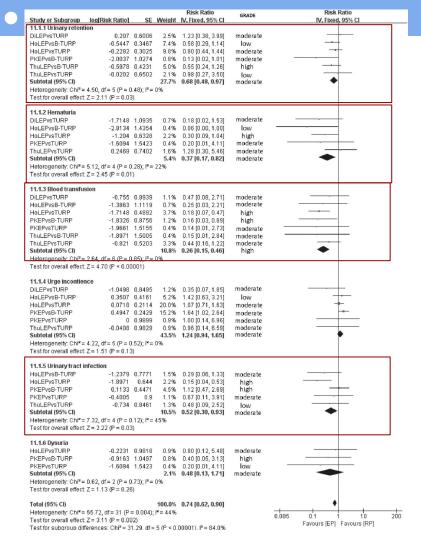
Efficacy and safety of enucleation vs. resection of prostate for treatment of benign prostatic...

Table 2 IIEF-5 at 6, 12, and 24 months postoperatively and complication classification

	Studies	No. of patients	Pooled estimate	P	I^{2} (%)	GRADE
IIEF-5 6m	HoLEP vs. B-TURP	50/44	- 0.11 [- 1.23, 1.01]	0.85	NA	Low
	PKEP vs. B-TURP	40/40	0.60 [- 0.66, 1.86]	0.35	NA	Moderate
	HoLEP vs. TURP	124/120	0.12 [- 0.47, 0.72]	0.68	0	Moderate
	PKEP vs. TURP	102/102	0.20 [-1.43, 1.83]	0.81	NA	Low
	Overall effect	316/306	0.16 [-0.31, 0.62]	0.51	0	Low
HEF-5 12m	PKEP vs. B-TURP	40/39	0.22 [-1.04, 1.48]	0.73	NA	Moderate
	HoLEP vs. TURP	198/197	0.08 [- 0.47, 0.63]	0.78	0	High
	PKEP vs. TURP	102/102	- 1.60 [- 3.44, 0.24]	0.09	NA	Moderate
	Overall effect	340/338	- 0.02 [- 0.50, 0.47]	0.94	0	Moderate
IIEF-5 24m	HoLEP vs. B-TURP	50/44	0.02 [- 0.05, 0.09]	0.56	NA	Moderate
	PKEP vs. B-TURP	39/37	- 0.15 [- 1.59, 1.29]	0.84	NA	Low
	HoLEP vs. TURP	132/132	0.07 [- 0.50, 0.64]	0.82	0	High
	PKEP vs. TURP	91/89	0.10 [-1.35, 1.55]	0.89	NA	Low
	Overall effect	312/302	0.02 [-0.05, 0.09]	0.54	0	Low
Grade I	HoLEP vs. B-TURP	230/230	2.63 [1.17,5.87]	0.02	78	Moderate
	PKEP vs. B-TURP	237/239	0.54 [0.26,1.14]	0.11	59	High
	ThuLEP vs. B-TURP	181/185	0.62 [0.28,1.37]	0.24	0	Moderate
	DiLEP vs. TURP	74/52	2.64 [0.93, 7.49]	0.07	NA	Moderate
	HoLEP vs. TURP	397/393	0.91 [0.74,1.13]	0.41	59	Moderate
	PKEP vs. TURP	102/102	0.78 [0.50, 1.22]	0.28	NA	Low
	ThuLEP vs. TURP	83/82	0.88 [0.63,1.22]	0.44	0	Moderate
	Overall effect	1304/1283	0.94 [0.80,1.10]	0.42	47	Moderate
Grade II	HoLEP vs. B-TURP	200/200	0.52 [0.01, 24.32]	0.74	85	Low
	PKEP vs. B-TURP	302/304	0.71 [0.23,2.19]	0.55	78	Moderate
	ThuLEP vs. B-TURP	102/106	0.91 [0.34, 2.42]	0.85	NA	High
	DiLEP vs. TURP	74/52	0.40 [0.12, 1.30]	0.13	NA	High
	HoLEP vs. TURP	491/487	0.49 [0.21, 1.17]	0.11	66	High
	PKEP vs. TURP	102/102	0.40 [0.08, 2.01]	0.27	NA	Low
	ThuLEP vs. TURP	83/82	0.51 [0.20, 1.26]	0.14	0	Moderate
	Overall effect	1354/1333	0.61 [0.38, 0.97]	0.04	64	High
Grade III	HoLEP vs. B-TURP	200/200	0.29 [0.07, 1.19]	0.09	0	High
	PKEP vs. B-TURP	302/304	0.50 [0.18,1.45]	0.20	0	High
	ThuLEP vs. B-TURP	102/106	0.52 [0.13, 2.02]	0.35	NA	Moderate
	HoLEP vs. TURP	461/457	0.58 [0.31, 1.07]	0.08	0	High
	PKEP vs. TURP	102/102	0.20 [0.02, 1.68]	0.14	NA	Moderate
	ThuLEP vs. TURP	54/52	6.75 [0.36,127.48]	0.20	NA	Low
	Overall effect	1221/1221	0.54 [0.35, 0.83]	0.005	0	Moderate
Grade IV	HoLEP vs. TURP	52/48	0.31 [0.01, 7.39]	0.47	NA	Low
	PKEP vs. TURP	102/102	0.20 [0.01, 4.11]	0.30	N/A	Low
	Overall effect	154/150	0.24 [0.03, 2.15]	0.20	0	Low

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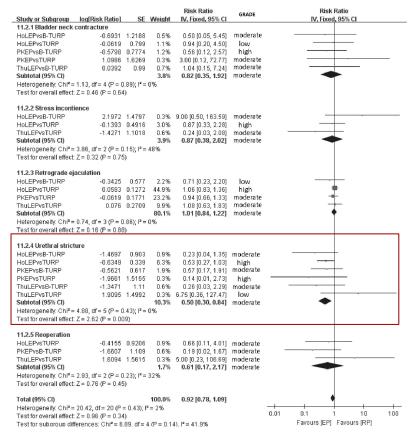
B-TURP bipolar transurethral resection of the prostate, DiLEP diode laser enucleation of the prostate, GRADE grading of recommendation assessment, development, and evaluation system, HoLEP holmium laser enucleation of the prostate, IIEF-5 international index of erectile function-5, NA not available, PKEP plasma kinetic enucleation of prostate, ThuLEP thulium laser enucleation of the prostate, TURP transurethral resection of the prostate.



Overall, <u>early complications</u> occurred less in the enucleation group



Urinary retention	RR = 0.68 (1.47 times less likely) 95% CI (0.48, 0.97)
Hematuria	RR = 0.37 (2.70 times less likely) 95% CI (0.17, 0.82)
Blood transfusion	RR = 0.26 (3.85 times less likely) 95% CI (0.15, 0.46)
Urinary tract infection	RR = 0.52 (1.92 times less likely) 95% CI (0.30, 0.93)



Late complications

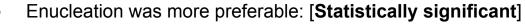
No statistically significant difference for others

in the enucleation group

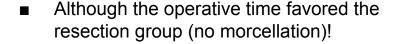
→ 0.50 [0.30, 0.84] (2 times!)

Authors' Conclusions

Enucleation had greater efficacy and safety compared with resection for treatment of BPH.



- IPSS (at 12 months post-operatively)
- Qmax (at 12 months post-operatively)





- ★ Less severity of early complications
- ★ Less adverse events
- ★ Shorter hospital stay

THANK YOU!

