Heelkundige behandeling van BPH in 2021

HoLEP – endoscopische enucleatie van de prostaat

Regionaal ziekenhuis Heilig Hart Leuven

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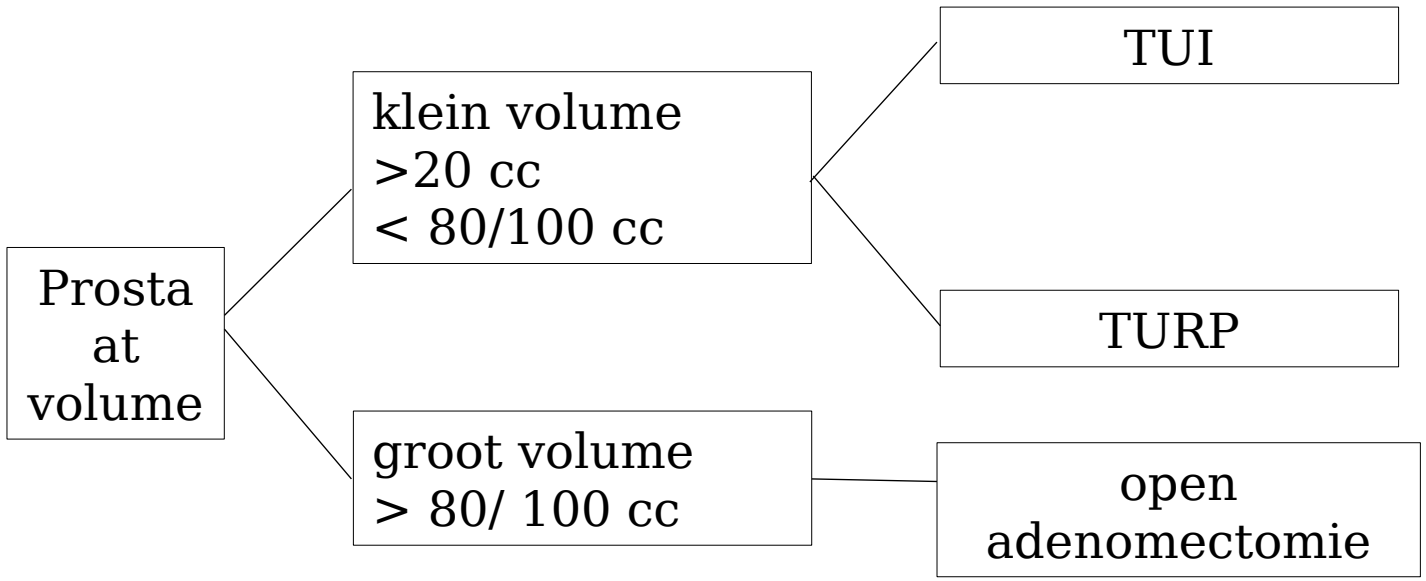
HoLEP – endoscopische enucleatie van de prostaat

1. Introductie



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1. Introductie

Morbidity, Mortality and Early Outcome of Transurethral Resection of the Prostate: A Prospective Multicenter Evaluation of 10,654 Patients

TABLE 2. *Influence of resection weight on morbidity and mortality*

	Transfusion	TUR Syndrome	Surgical Revision	UTI	Failure	Mortality
% Resection wt (gm):						
30 or Less (5,506)	2.0	1.2	5.2	3.7	6.4	0.09
30–60 (3,130)	3.4	1.4	6.2	3.5	5.1	0.06
60 or Greater (561)	9.5	3.0	9.8	4.5	5.3	0.71
Overall (9,197)	2.9	1.4	5.6	3.6	5.8	0.10
OR (95% CI):						
Greater than 60 vs 30 or less	5.17 (3.67–7.26)	2.58 (1.5–4.42)	1.97 (1.46–2.66)	1.23 (0.80–1.88)	0.85 (0.56–1.21)	7.90 (2.12–29.51)
Greater than 60 vs 31–60	2.98 (2.11–4.19)	2.24 (1.27–3.96)	1.65 (1.20–2.56)	1.31 (0.84–2.04)	1.04 (0.70–1.56)	11.23 (2.05–61.47)

J Urol 2008

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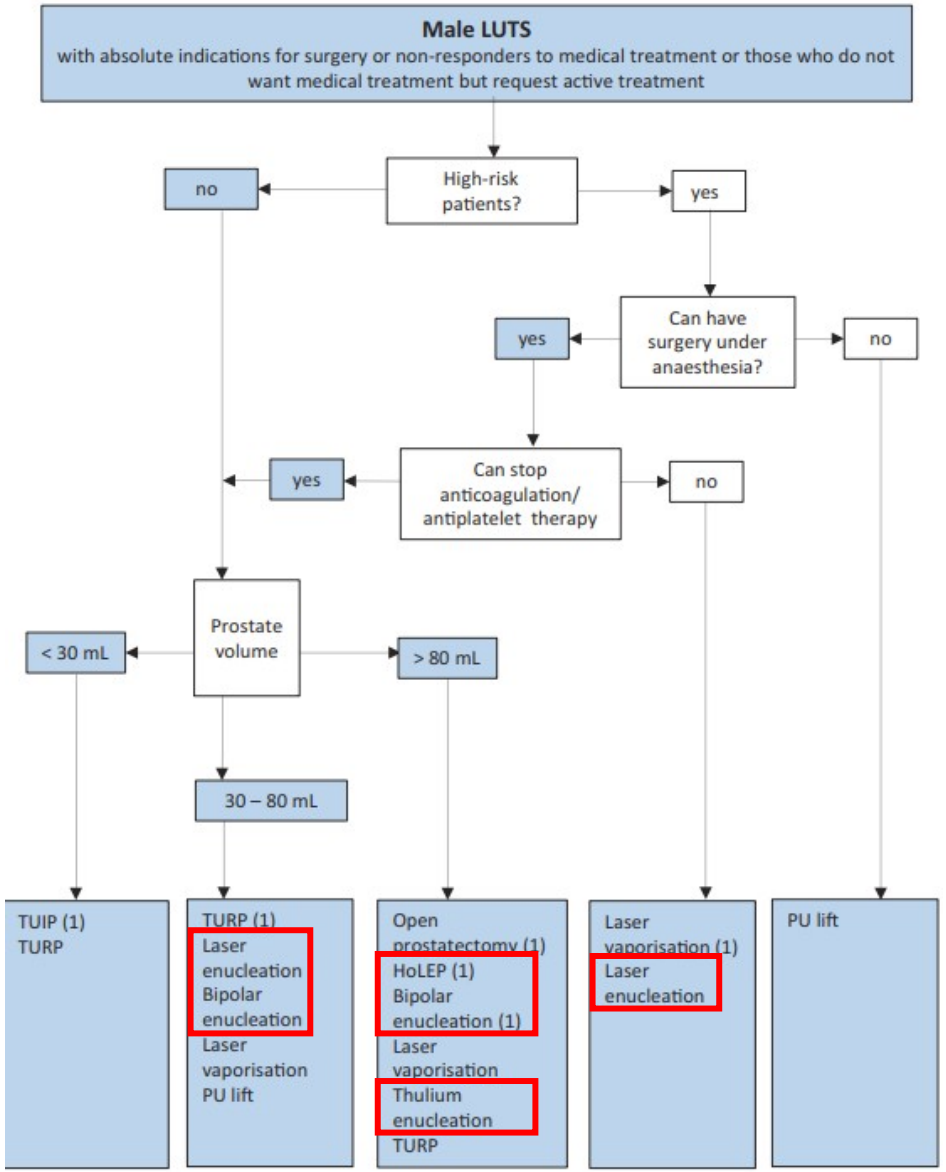
HoLEP – endoscopische enucleatie van de prostaat

1. Introductie

EAU guidelines 2021….

enucleatie



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HoLEP – endoscopische enucleatie van de prostaat

1. Introductie

European Urology

Clinical Paper

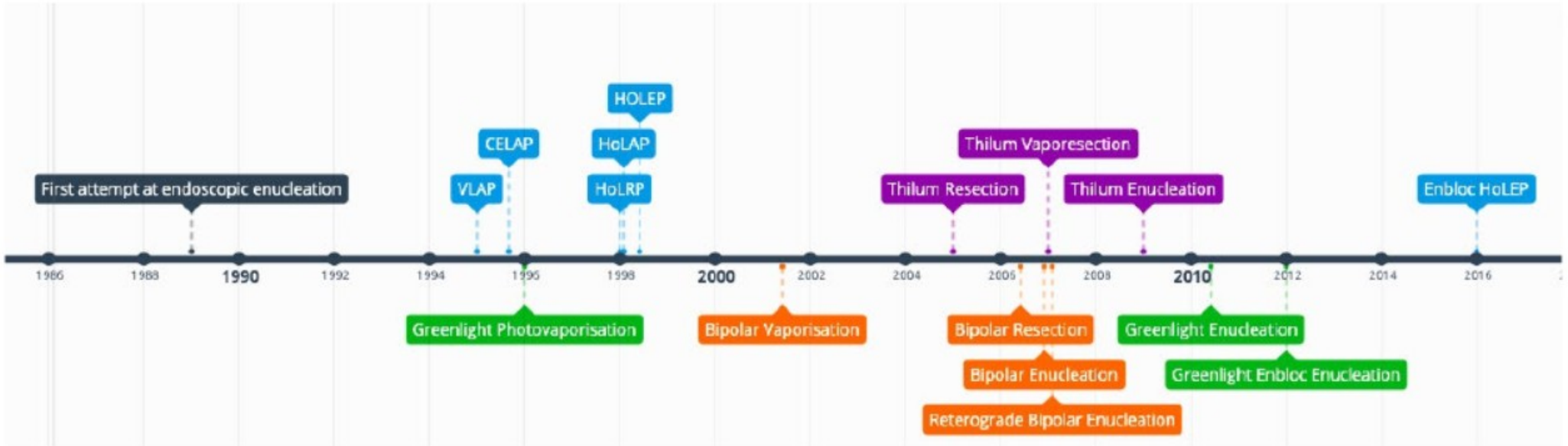
Eur Urol 1998;33:69–72

Mark R. Fraundorfer
Peter J. Gilling

Department of Urology, Tauranga Hospital, Tauranga, New Zealand

Holmium:YAG Laser Enucleation of the Prostate Combined with Mechanical Morcellation: Preliminary Results

Endoscopische identificatie van vlak tussen prostaatkapsel en prostaatadenoom



Eur Urol 1998
Andrologia 2020

HoLEP – endoscopische enucleatie van de prostaat

1. Introductie

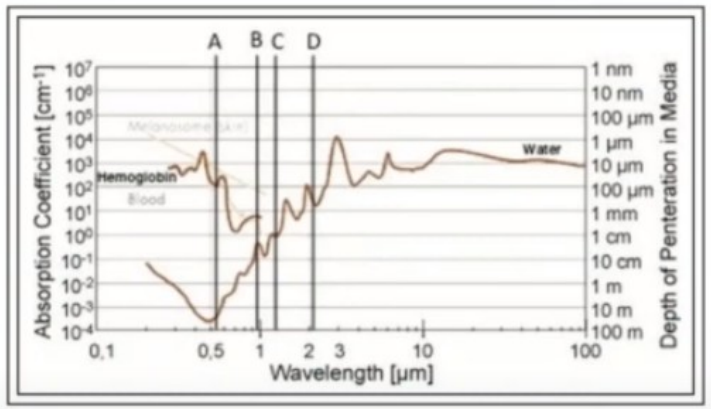


Figure 1. Absorption spectrum of hemoglobin and water depending on the wavelength of the laser. Chromophore absorption at point A: 532 nm (Greenlight), at point B: 940 nm-980 nm (Diode) lasers, at point C: 1318 nm-1470 nm (Diode lasers) and at point D: 2013 nm-2100 nm (Holmium and Thulium lasers).

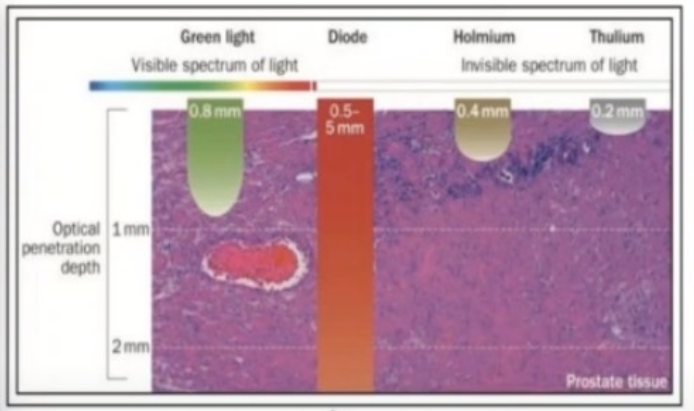
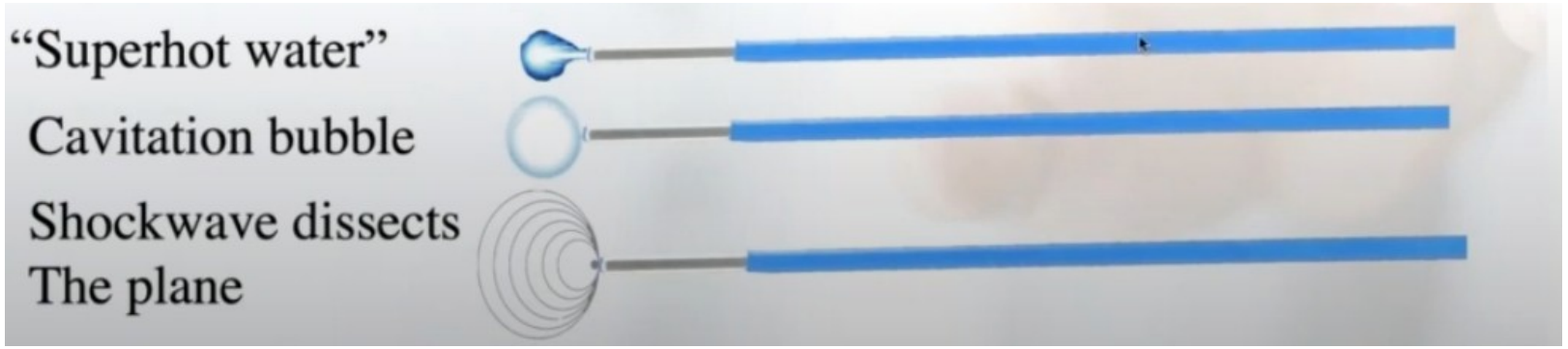


Figure 2. Optical penetration depth of the different laser systems. The tissue penetration primarly depends on laser wavelength and power output. Thulium-based lasers have the shallowest penetration depth, whereas diode lasers penetrate the deepest.



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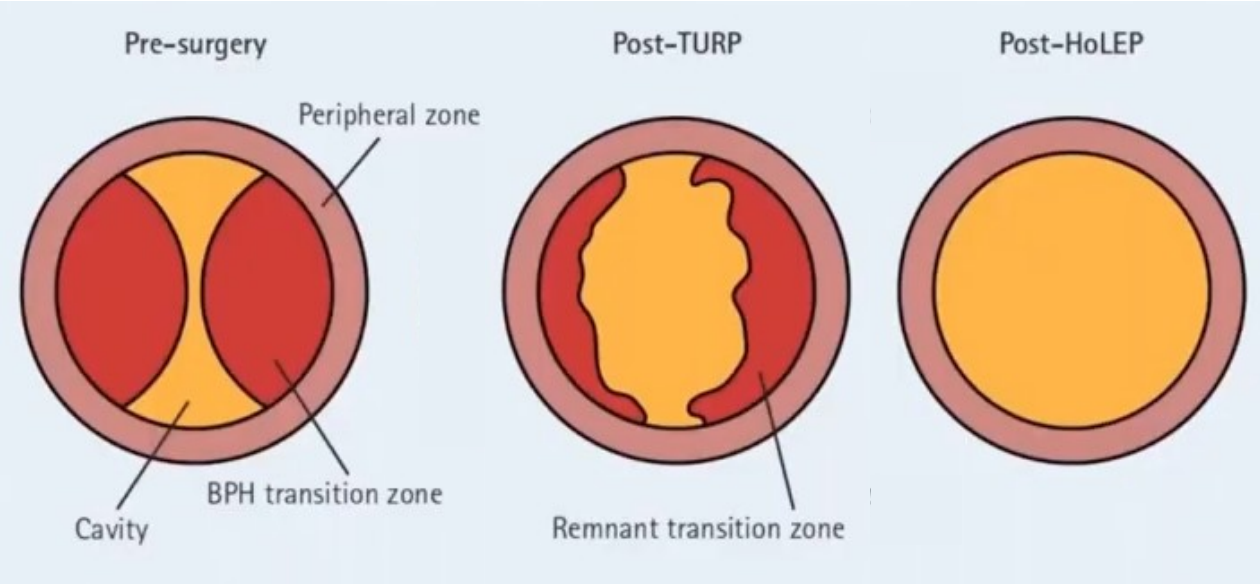



Gomez Sancha, YouTube

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HoLEP – endoscopische enucleatie van de prostaat

2. HoLEP versus TURP

A Systematic Review and Meta-analysis of Functional Outcomes and Complications Following Transurethral Procedures for Lower Urinary Tract Symptoms Resulting from Benign Prostatic Obstruction: An Update

Jean-Nicolas Cornu[a,], Sascha Ahyai[b], Alexander Bachmann[c], Jean de la Rosette[d], Peter Gilling[e], Christian Gratzke[f], Kevin McVary[g], Giacomo Novara[h], Henry Woo[i], Stephan Madersbacher[j]*

Transurethral and Lower Tract Procedures

Holmium Laser Enucleation of the Prostate Versus Transurethral Resection of the Prostate: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Lei Yin, MD[1], Jingfei Teng, MD[*,1,2], Chien-Jung Huang, MD[3], Xiangmin Zhang, MD[1], and Danfeng Xu, MD[1]

A Systematic Review and Meta-analysis of Efficacy and Safety Following Holmium Laser Enucleation of Prostate and Transurethral Resection of Prostate for Benign Prostatic Hyperplasia

Jian Zhong, Zhenhua Feng, Yeping Peng, and Hao Liang

HOLMIUM LASER ENUCLEATION VERSUS TRANSURETHRAL RESECTION OF THE PROSTATE: RESULTS FROM A 2-CENTER, PROSPECTIVE, RANDOMIZED TRIAL IN PATIENTS WITH OBSTRUCTIVE BENIGN PROSTATIC HYPERPLASIA

FRANCESCO MONTORSI,* RICHARD NASPRO, ANDREA SALONIA, NAZARENO SUARDI, ALBERTO BRIGANTI, MATTEO ZANONI, SERGIO VALENTI, IVANO VAVASSORI AND PATRIZIO RIGATTI

HoLEP, superieure resultaten ivm TURP

- Gunstiger IPSS na 1 jaar en op lange termijn
- Hogere Q max na 1 jaar en op lange termijn
- Lager residu
- Minder bloedverlies
- Kortere sondage
- Kortere hospitalisatie
- Langere OKtijd





HoLEP – endoscopische enucleatie van de prostaat

3. HoLEP versus open adenomectomie

Transurethral Holmium Laser Enucleation of the Prostate Compared with Transvesical Open Prostatectomy: 18-Month Follow-Up of a Randomized Trial

RAINER M. KUNTZ, M.D., KARIN LEHRICH, M.D., and SASCHA AHYAI

Holmium Laser Enucleation of the Prostate Versus Open Prostatectomy for Prostates >70 g: 24-Month Follow-up

Richard Naspro, Nazareno Suardi, Andrea Salonia, Vincenzo Scattoni, Giorgio Guazzoni, Renzo Colombo, Andrea Cestari, Alberto Briganti, Bruno Mazzoccoli, Patrizio Rigatti, Francesco Montorsi*

Holmium laser enucleation versus simple prostatectomy for treating large prostates: Results of a systematic review and meta-analysis

Patrick Jones [a,*], Laith Alzweri [b], Bhavan Prasad Rai [c], Bhaskar K. Somani [d], Chris Bates [e], Omar M. Aboumarzouk [f]

- ✓ Functioneel (IPSS, Qmax, peak flow) gelijkwaardige resultaten
- ✓ HoLEP minder invasief (sondageduur, HOSduur, bloedverlies)
- ✓ HoLEP langere OK tijd

	Baseline	24 mo
Qmax		
HoLEP group	7.83 ± 3.42	19.19 ± 6.3
OP group	8.32 ± 2.37	20.11 ± 8.8
p value	0.64	0.91
Qave		
HoLEP group	5.28 ± 2.78	11.6 ± 5.3
OP group	4.76 ± 1.63	12.2 ± 5.3
p value	0.59	0.88
IPSS		
HoLEP group	20.11 ± 5.84	7.9 ± 6.2
OP group	21.60 ± 3.24	8.1 ± 7.1
p value	0.27	0.44
QOL question		
HoLEP group	4.07 ± 0.93	1.5 ± 0.87
OP group	4.44 ± 0.96	1.66 ± 0.76
p value	0.17	0.76

5. Conclusions

HoLEP is a safe and minimally invasive technique for the treatment of small and large prostates. Even though HoLEP takes longer to perform than OP, it is associated with reduced perioperative morbidity, significantly shorter catheterisation, and a shorter hospital stay. Furthermore, functional results are comparable at the 2-yr follow-up; thus, HoLEP is an attractive alternative to OP.

HoLEP – endoscopische enucleatie van de prostaat

4. HoLEP: complicaties

Incontinentie na HoLEP

- Maximale desobstructie → gemengde incontinentie 1 transiënt
  44%
- Blijvende incontinentie 0,5 – 1 %
- Risico factoren: leeftijd
  grote prostaatvolumes (> 80 cc)
  84% PSA reductie
  peroperatief bloedverlies
  preoperatief DO

	Study	Year	HoLEP vs.	Main outcome	n	Follow-up (year)	Specimen weight (g), volume* (ml)	Transfusion rate	Postop IPSS value (year)	AUR[a] events (years postop)	Regrowth Re-Tx[a] Events (years postop)	Urethral stricture (years postop)	BNC (years postop)	t-UI <3 months	p-UI	Retrograde ejaculation
2	Montorsi *et al.*	2008	TURP	Improve LUTS	52	1	36	–	4.1 (1)	5.8% (0.25)		1.9% (1)	–	48%	1.90%	–
3	Kuntz *et al.*	2004	TURP	Improve LUTS	100	1	35.9	0	1.7	0 (1)	1% (1)	3% (1)	3% (1)	7%	1% (1)	74%
30	Elmansy *et al.*	2011	HoLEP	Long term Outcomes	950[a]	10	81*	0.4%	4.4 (1), 3.6 (10)	–	0.07% (10)	1.6% (10)	0.8% (10)	4.9%	0.5% (5)	–
	Naspro *et al.*	2006	open simple prostatectomy	Feasible for large prostates	41	2	59.33	5%	8.45(1)	12% (0.25)	–	2.8% (2)	–	34%	5.4% (1)	–
7	Elshal *et al.*	2015	PVP	Safety and efficacy	50	1	–	0	4 (1)	–	–	0	2% (1)	10%	0	–

J Urol 2004
Curr Opin Urol 2018

4. HoLEP: complicaties

Predictor of De Novo Urinary Incontinence Following Holmium Laser Enucleation of the Prostate

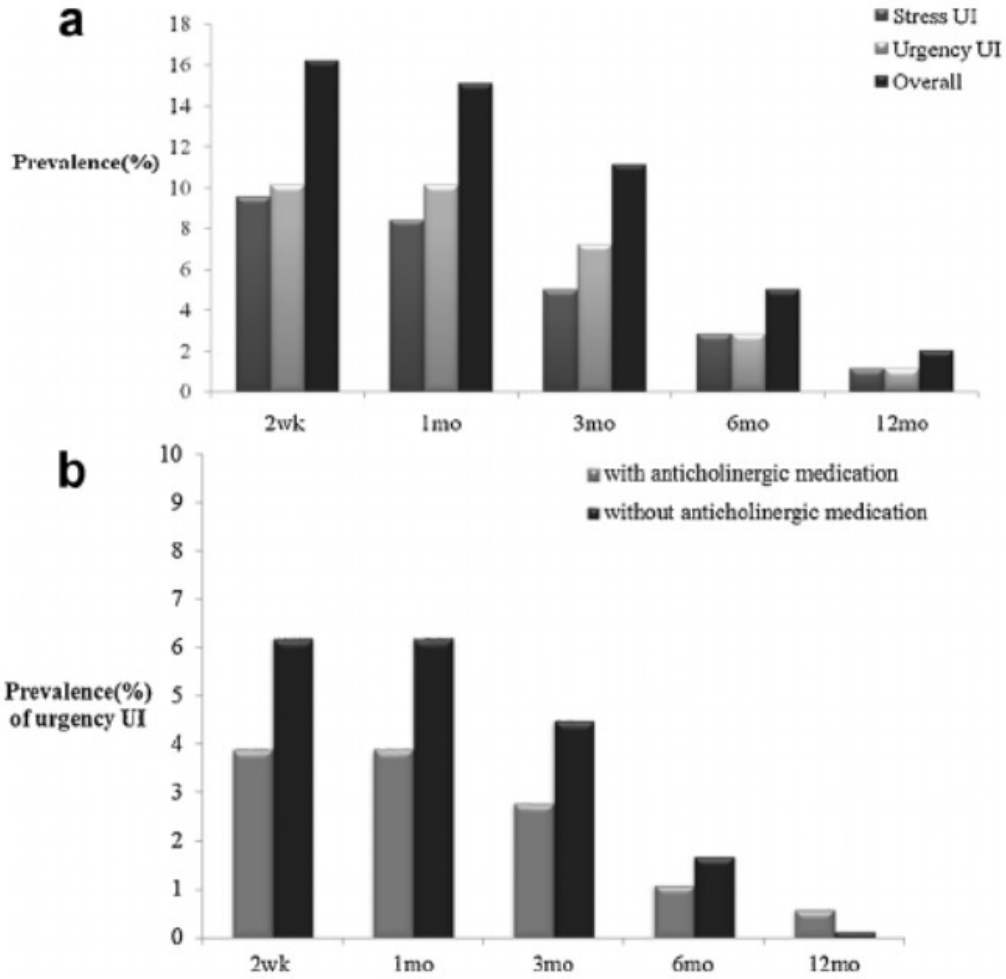
Min Chul Cho,[1] Ji Hyun Park,[2] Min Su Jeong,[2] Jun-Seok Yi,[2] Ja Hyeon Ku,[2] Seung-June Oh,[2] Soo Woong Kim,[2] and Jae-Seung Paick[2,*]

Predictoren postoperatieve incontinentie:

- Blaasletsel tijdens morcellatie
- Beperkte ervaring chirurg
- Preoperatief lage uretrale sluitingsdruk op UDO

Oorzaken incontinentie

- Stress geinduceerde detrusoroveractiviteit
- De-epithelialisatie van sfinctermucosa
- Tractie op sfincter tijdens enucleatie
- Hypoactieve sfincter bij uitgesproken BPH



NeuroUrol Urodyn 2011
J Urol 2017

4. HoLEP: complicaties

Patient-reported Sexual Outcomes After Holmium Laser Enucleation of the Prostate: A 3-year Follow-up Study

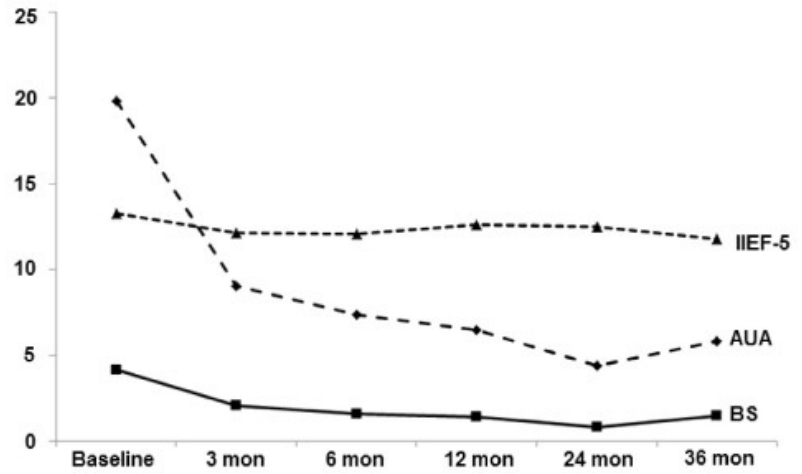


Figure 1. Preoperative and postoperative IIEF-5 and IPSS (AUA and BS) values. AUA, American Urological Association symptom score; BS, bother score; IIEF-5, International Index of Erectile Function 5; IPSS, International Prostate Symptom Score.

4. HoLEP: complicaties

Holmium Laser Enucleation of the Prostate: Long-Term Durability of Clinical Outcomes and Complication Rates During 10 Years of Followup

Hazem M. Elmansy, Ahmed Kotb and Mostafa M. Elhilali*,†

From the Division of Urology, Department of Surgery, Faculty of Medicine, McGill University, Montreal, Quebec, Canada

Complications were minimal in our cohort of patients. Bladder neck contracture and urethral stricture developed in 0.8% and 1.6% of patients, respectively. The reoperation rate as a result of recurrent obstruction from residual adenoma was 0.7%. Transient SUI was found in 47 men (4.9%) at the first 3-month followup visit and only 5 (0.5%) still had SUI up to the last followup visit. Persistent urge incontinence was found in 1% of our cohort.

TABLE 2. SHORT- AND LONG-TERM COMPLICATIONS OF PATIENTS UNDERGOING HOLMIUM LASER ENUCLEATION OF THE PROSTATE (Table view)

Variables		*No (%)*
Short-term complications	Failed trial of voiding	17 (1.4 %)
	Hematuria (conservative)	16 (1.3%)
	Epididymo-orchitis	2 (0.16%)
	Deep vein thrombosis	5 (0.4%)
Long-term complications	Recurrent urinary tract infection	8 (0.7%)
	Bladder neck contracture	14 (1.1%)
	Urethral stricture	25 (2.0%)
	Bladder stone	9 (0.7%)
	Residual/regrowth adenoma	15 (1.2%)
	Stress urinary incontinence	6 (0.5%)
	Chronic retention (CIC)	4 (0.3%)

CIC=clean intermittent catheterization.

5. HoLEP: learning curve

HoLEP – uitstekende resultaten, doch nog niet wijdverspreid

- kostprijs high power laser?
  - low power HoLEP 1,5J – 20 Hz
- leercurve?
  - niet traag oplopend, doch steil
  - 25 tot 50 casussen
    - vermijd prostaatvolumes > 80 cc
    - vermijd antico / anti-aggregantia
    - vermijd gesondeerde patiënten
    - vermijd status na RT / eerdere heelkunde
- enucleatietijd ↓ en energie efficiëntie ↑, ook na 50 casussen
- conversiekans naar TURP ↓

Safety and Effectiveness of Holmium Laser Enucleation of the Prostate Using a Low-power Laser

Shingo Minagawa, Shinsuke Okada, and Hirofumi Morikawa

Faciliteren learning curve: mentor
video's (YouTube)
simulator
hoge case density van meet af aan

HoLEP – endoscopische enucleatie van de prostaat

5. HoLEP: learning curve

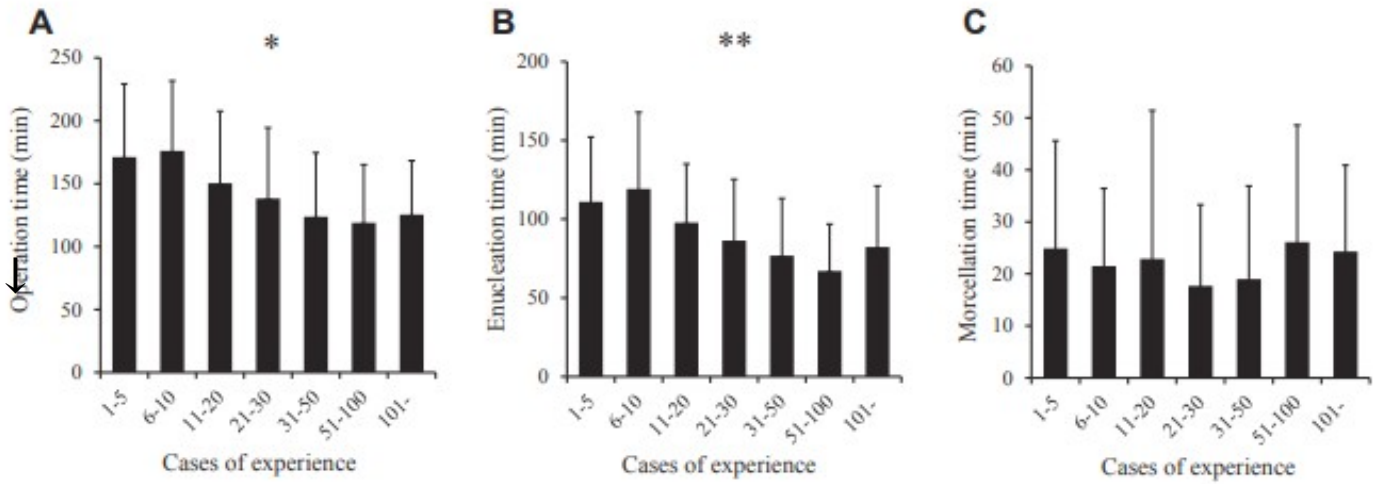
OK tijd ↓

enucleatie tijd ↓

transiënte incontinentieratio ↓

Does Surgeon Experience Affect Operative Time, Adverse Events and Continence Outcomes in Holmium Laser Enucleation of the Prostate? A Review of More Than 1,000 Cases

Katsumi Shigemura,* Fukashi Yamamichi, Koichi Kitagawa, Masuo Yamashita, Yasuhiko Oka, Hirokazu Tanaka and Masato Fujisawa



HoLEP operative (*A*) and enucleation (*B*) times decreased and significantly correlated with increased surgeon experience. Morcellation time (*C*) was not affected by increased surgeon experience (p = 0.4868). Each data point represents mean ± SD. Single asterisk indicates p = 0.0146. Double asterisks indicate p = 0.0216.

	Surgeon Experience (No. cases)							
	1–5	6–10	11–20	21–30	31–50	51–100	101+	p Value
% Postop urinary incontinence	11.30	12.70	15.20	7.75	8.84	8.61	2.99	0.0405

J Urol 2017

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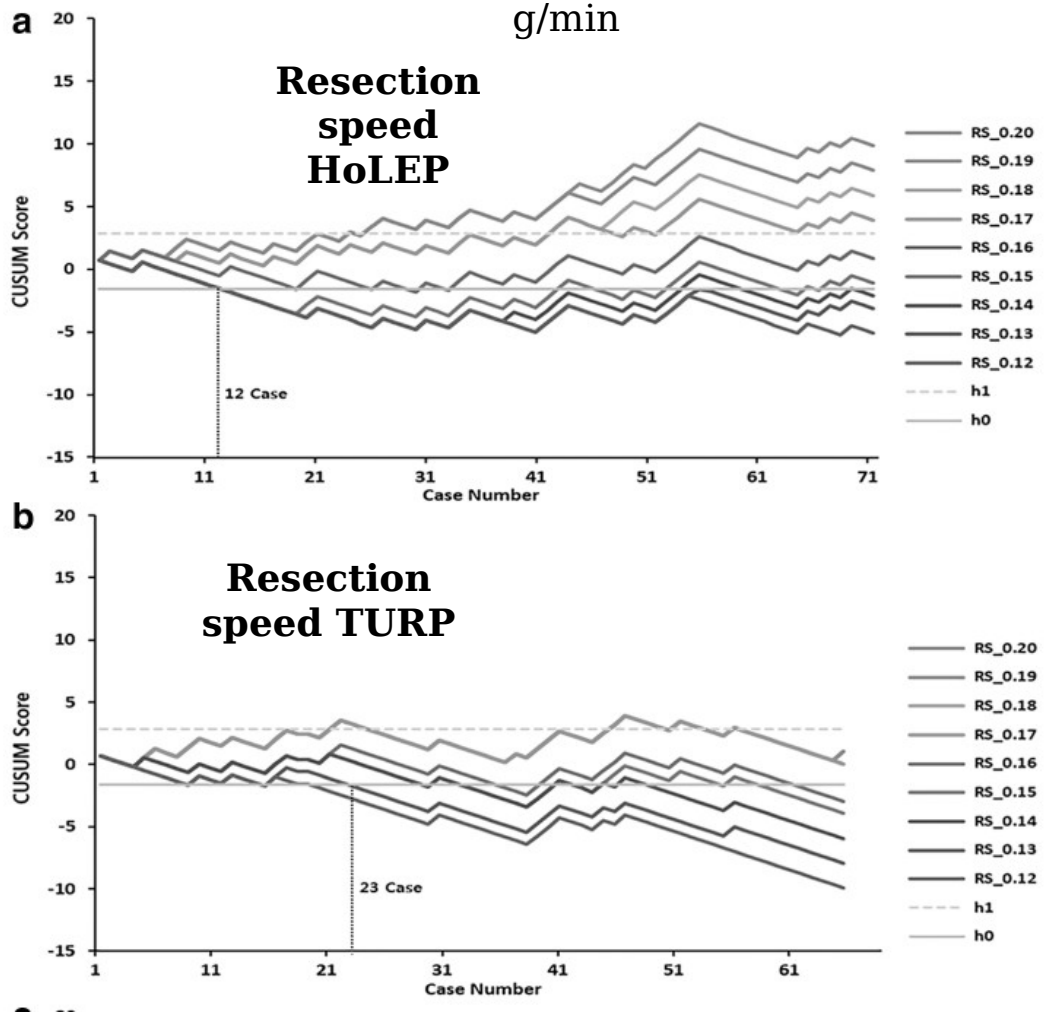
5. HoLEP: learning curve

Competence level 0,13 g/min

Comparison Study of Learning Curve Using Cumulative Sum Analysis Between Holmium Laser Enucleation of the Prostate and Transurethral Resection of the Prostate: Is Holmium Laser Enucleation of the Prostate a Difficult Procedure for Beginner Urologists?

Ki Hong Kim[1], Hee Jo Yang[1], Nam Hun Heo[2], Si Hyun Kim[1], Doo Sang Kim[1], Chang Ho Lee[1], and Youn Soo Jeon, MD, PhD[1]

This study indicated that it is easier to achieve an RS of 0.13 g/mL with HoLEP than with TURP, and that it is easier to achieve a more efficient RR (0.40 *vs* 0.35) with HoLEP than with TURP. After performing this comparison study of the learning curves of HoLEP and TURP with the CUSUM analysis, we suggest that HOLEP is not more difficult than TURP when performed by beginner urologists and that it is not necessary to avoid HoLEP because of its reputation as a difficult procedure.



J. EndoUrol 2021

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6. HoLEP en anticoagulantia

Transurethral Lower Tract Procedures

Real-World Experience of Holmium Laser Enucleation of the Prostate with Patients on Anticoagulation Therapy

Deepak K. Agarwal, MD, Tim Large, MD, MS, Christa L. Stoughton, Joshua M. Heiman, MD, Charles U. Nottingham, MD, Marcelino E. Rivera, MD, and Amy E. Krambeck, MD

	Control + asaflow *Control (n = 377)*	**clopidogrel** *AP (n = 30)*	**anticoagulantia** *AC (n = 65)*	*p*
Concomitant cystolitholapaxy	*n* = 32 (8.4%)	*n* = 1 (3.3%)	*n* = 4 (6.2%)	0.540
Enucleation time	44.0 (19.3)	42.9 (15.2)	47.9 (17.7)	0.173
Morcellation time	9.4 (10.9)	8.73 (8.3)	9.0 (7.2)	0.793
Total energy (kJ)	95 (49.3)	91.5 (35.4)	97.3 (43.6)	0.697
OR specimen weight (g)	66.4 (58.6)	63.37 (49.4)	68.1 (52.9)	0.841
Same-day discharge, success/attempts	150/170 (88.2%)	10/12 (85.7%)	20/24 (83.3%)	0.777
Transfusion	*n* = 2 (0.5%)	*n* = 0 (0%)	*n* = 0 (0%)	0.742
Clot evacuation	5 (1.3%)	0 (0%)	1 (1.5%)	0.667
Postoperative voiding trial passage	*n* = 314 (82.4%)	*n* = 22 (73.3%)	*n* = 52 (80%)	0.294
Postoperative hemoglobin drop	1.2 (1.4), *n* = 195	1.0 (1.2), *n* = 13	1.1 (1.5), *n* = 39	0.552

Conclusions: HoLEP is safe and effective for patients who require AP or AC therapy. There is no increase in serious complications or worsened postoperative voiding parameters. Of patients on AC,

Of the 65 patients on AC therapy, 23 (35.3%) were on warfarin and the remaining 42 (64.7%) were on DOACs. At the time of the procedure, 6 (9.2%) AC patients had their anticoagulation therapy discontinued but bridged with heparin or low-weight molecular heparin, and one patient continued AC through operation. For patients on AP therapy, one patient (3.3%) continued clopidogrel through the time of procedure. The remainder of the patients stopped AP/AC perioperatively.

HoLEP – endoscopische enucleatie van de prostaat

6. HoLEP en anticoagulantia

Safety of Holmium Laser Enucleation of the Prostate in Anticoagulated Patients

Mark D. Tyson, B.S.,[1] and Lori B. Lerner, M.D.[1,2]

Transurethral and Lower Tract Procedures

Holmium Laser Enucleation of the Prostate in Patients Requiring Anticoagulation

Marawan M. El Tayeb, MD[1], Joseph M. Jacob, MD[2], Naeem Bhojani, MD[3], Elaine Bammerlin, MD[4], and James E. Lingeman, MD[2]

Safety and feasibility study of holmium laser enucleation of the prostate (HOLEP) on patients receiving dual antiplatelet therapy (DAPT)

Jie Sun[1] · An Shi[1] · Zhen Tong[1] · Wei Xue[1]

Holmium Laser Enucleation of the Prostate: Comparison of Immediate Postoperative Outcomes in Patients with and without Antithrombotic Therapy

Conrad V. Bishop[a] Heath Liddell[a] Joseph Ischia[a] Eldho Paul[b]
Sree Appu[a] Mark Frydenberg[a,c] Trung Pham[a]

Antico / antiaggregantia bij HoLEP

- langere sondage met continue spoeling
- langere hospitalisatieduur (2 ipv 1 dag)
- transfusieratio ↑

6. HoLEP en anticoagulantia

Holmium Laser Enucleation of the Prostate: Comparison of Immediate Postoperative Outcomes in Patients with and without Antithrombotic Therapy

Conrad V. Bishop[a] Heath Liddell[a] Joseph Ischia[a] Eldho Paul[b]
Sree Appu[a] Mark Frydenberg[a,c] Trung Pham[a]

Of the 52 patients that remained on antithrombotic agents during the HOLEP, 11 patients were on aspirin, 3 patients on dipyridamole/aspirin, 16 patients on clopidogrel and 22 patients on warfarin. The indications for antithrombotic therapy are summarized in table 2. The mean INR of the warfarinised patients was 2.61 (SD 0.66) at the time of surgery. The INR range was 1.7 to 3.9.

Meer bloedtransfusie

Langere HOS

	Antithrombotic	Non-antithrombotic	p
Patients, n	52	73	
Blood transfusion	4 (7.7%)	0	0.028
Return to theatre	0 (0.0%)	2 (2.7%)	0.51
Failed TOV	9 (17.3%)	5 (6.9%)	0.07
Median (IQR) length of stay, d	2 (1–3)	1 (1–2)	0.014

HoLEP – endoscopische enucleatie van de prostaat

7. HoLEP – ambulante behandeling?

Same Day Discharge is a Successful Approach for the Majority of Patients Undergoing Holmium Laser Enucleation of the Prostate

Deepak K. Agarwal [a], Tim Large [a], Yan Tong [b], Christa L. Stoughton [a], Erica M. Damler [a], Charles U. Nottingham [a], Marcelino E. Rivera [a], Amy E. Krambeck [a,]*

[a] Department of Urology, Indiana University School of Medicine, Indianapolis, IN, USA; [b] Department of Biostatistics, Indiana University School of Medicine Indianapolis, IN, USA

Pulsmodulatie (Moses / Virtual Basket)

Meticuleuze hemostase

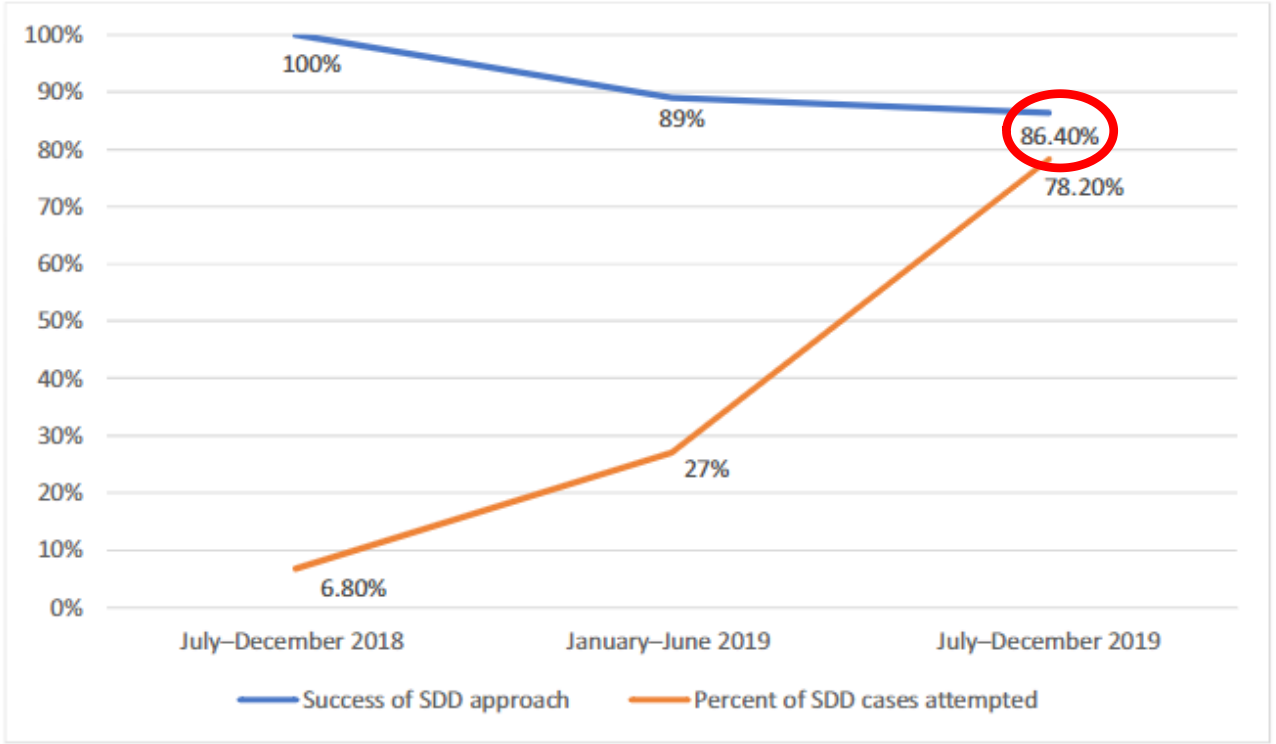
Opleiding verpleegkundigen

Patient education

87% succesvol ambulant ontslagen

Chirurgische ervaring

“Patients were discharged with the cath in place and returned on POD1 for catheter removal”



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HoLEP – endoscopische enucleatie van de prostaat

8. Endoscopische enucleatie van de prostaat - EEP

ThuLEP

BIPOLEP

Enucleation is enucleation is enucleation is enucleation

Thomas R. W. Herrmann[1]

ThuFLEP

ThuVARP

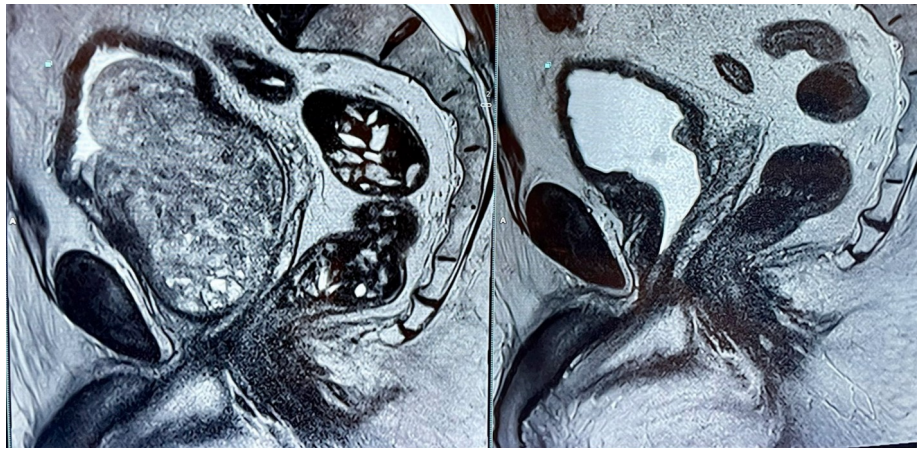
DiLEP

GreenLEP

W J Urol 2016
YouTube

HoLEP – endoscopische enucleatie van de prostaat

- ✓ HoLEP/EEP superieur aan TURP met uitstekende langetermijnsresultaten
- ✓ HoLEP/EEP uitstekende lange termijnsresultaten
- ✓ HoLEP/EEP onafhankelijk van prostaatvolume
- ✓ HoLEP/EEP gouden standaard voor heelkundige behandeling van BPH
- ✓ HoLEP/EEP aanvaardbare learning curve
- ✓ BIPOLEP, alternatief voor HoLEP zonder nood aan investeringen





Fernando GomezSancha @fgomsan · 24 sep.

We all ignore a lot of things. But people who do not do AEEP ignore how good the everyday feedback it is from patients… this explains how TURP fans still defend it (they ignore what we know) and how Urologists who uptake AEEP become diehard fans of enucleation.

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