time, length of hospital stay, surgical complications and 3-mo functional outcomes.

**Results:** Overall, 187 patients were included in the study. Preoperative characteristics were comparable among patients between the two groups ( p > 0.05) (Table 1). Notably, patients with CCI ≥3 were older [63 (IQR 59–67) vs 73 (IQR 69–77); p < 0.001] and had a significant higher use of AAT (42.1% vs 4.9%; p < 0.001). Median amount of energy delivered during HoLEP and lasing time were significantly higher in patients with CCI ≥3 compared to less comorbid patients [(141 vs 118 KJ; p = 0,016) (31 vs 36 min; p = 0.017), respectively], probably reflecting an increased need for hemostasis. As consequence, median enucleation and overall surgical time were significantly higher in the CCI ≥3 group [(45 vs 55; p = 0.026) (90 vs 95; p = 0.025), respectively]. No conversion to open prostatectomy or TURP were recorded in both groups. Intraoperative complications rate did not differ between the study groups (16.4% vs 17.4%, p = 0.77). Median time to catheter removal and hospital stay were also comparable between the two cohorts, as well the median hemoglobin drop after surgery (-0.80 vs –0.65 g/dl; p = 0,45). Early (30-days) surgical complications rate was comparable between the two groups (13.1 % vs 15.9%; p = 0.31). Transfusions were necessary in only 2 patients (1.5%) in the CCI > =3 group on post-operative day 1. There was no significant difference in the rate of postoperative bladder tamponades in the CCI ≥3 group as compared with CCI <3 (3.2% vs 4.9% p = 0.3). Similarly, late (>30-days) surgical complications were comparable between the two cohorts [4.9 % vs 7.9 %; p = 0.83]. At a 3 mo follow-up, the improvement in Qmax, IPSS, OAB and QoL scores did not differ between the two groups (all p > 0.05) (Table 2).

| Variables | Charlson Comorbidity Index | | *P* value |
|---|---|---|---|
| | CCI < 3 (n=61) | CCI ≥ 3 (n=126) | |
| **Preoperative features** | | | |
| Age (years) (median, IQR) | 63 (59 – 67) | 73 (69 – 77) | < 0.001 |
| BMI (kg/m^2) (median, IQR) | 25.8 (23.5 – 28.0) | 26.0 (24.5 – 29.0) | 0.878 |
| Prostate volume (mL) (median, IQR) | 100 (83 – 120) | 100 (75 – 130) | 0.540 |
| Antiplatelet and/or anticoagulant therapy (n, %) | 3 (4.9%) | 53 (42.1%) | < 0.001 |
| No antiplatelet/anticoagulant | 58 (95.1%) | 73 (57.9%) | / |
| Single antiplatelet therapy | 2 (3.3%) | 30 (23.8%) | |
| Double antiplatelet therapy | 1 (1.6%) | 5 (4.0%) | |
| Anticoagulant therapy | 0 (0%) | 14 (11.1%) | |
| Antiplatelet + anticoagulant | 0 (0%) | 4 (3.2%) | |
| Preoperative urinary incontinence | 6 (9.8%) | 15 (11.9%) | 0.385 |
| No incontinence | 55 (90.2%) | 111 (88.9%) | / |
| Urge incontinence | 5 (8.2%) | 12 (9.5%) | |
| Stress incontinence | 0 (0%) | 0 (0%) | |
| Mixed incontinence | 0 (0%) | 3 (2.4%) | |
| Overflow incontinence | 1 (1.6%) | 0 (0%) | |
| Preop Q max (mL/s) (median, IQR) | 8.0 (6.4 – 9.0) | 8.5 (7.5 – 10.0) | 0.035 |
| Preop Post voiding residual (mL) (median, IQR) | 223 (75 – 550) | 150 (100 – 300) | 0.521 |
| Preop PSA (ng/mL) (median, IQR) | 5.95 (2.51 – 8.79) | 4.88 (2.76 – 6.90) | 0.128 |
| Preop IPSS (median, IQR) | 25 (23 – 30) | 23 (20 – 27) | 0.03 |
| Preop IIEF-5 (median, IQR) | 20 (17 – 22) | 17 (12 – 20) | 0.031 |
| Preop OAB-q (median, IQR) | 42 (32 – 52) | 45 (35 – 58) | 0.790 |
| Preop ICIQ-sf (median, IQR) | 0 (0 – 0) | 0 (0 – 0) | 0.551 |
| Preop QoL (median, IQR) | 4 (4 – 5) | 4 (3 – 5) | 0.635 |

**Table 1** : Preoperative features of patients treated with HoLEP

| Variables | Charlson Comorbidity Index | | *P* value |
|---|---|---|---|
| | CCI < 3 (n=61) | CCI ≥ 3 (n=126) | |
| **Surgical features** | | | |
| Enucleation time (min) (median, IQR) | 45 (40 – 55) | 55 (45 – 60) | 0.026 |
| Morcellation time (min) (median, IQR) | 20 (15 – 35) | 20 (15 – 35) | 0.610 |
| Overall surgical time (min) (median, IQR) | 90 (70 – 110) | 95 (75 – 126) | 0.025 |
| Energy adopted (kJ) (median, IQR) | 118,497 (104,166 – 160,113) | 141,508 (117,736 – 170,164) | 0.016 |
| Lasing time (min) (median, IQR) | 31 (27 – 39) | 36 (31 – 42) | 0.017 |
| **Postoperative and functional features** | | | |
| Catheter time (days) (median, IQR) | 3 (3 – 3) | 3 (3 – 4) | 0.164 |
| Hospital stay (days) (median, IQR) | 4 (4 – 4) | 4 (4 – 5) | 0.347 |
| Postop Q max (mL/s) (median, IQR) | 24.1 (19.0 – 28.2) | 21.5 (17.8 – 26.0) | 0.554 |
| Postop Post voiding residual (mL) (median, IQR) | 21 (0 – 50) | 30 (0 – 50) | 0.675 |
| Postop IPSS (median, IQR) | 7 (2 – 9) | 4 (0 – 7) | 0.070 |
| Postop IIEF-5 (median, IQR) | 18 (16 – 20) | 15 (10 – 20) | 0.066 |
| Postop OAB-q (median, IQR) | 13 (13 – 15) | 13 (13 – 18) | 0.415 |
| Postop ICIQ-sf (median, IQR) | 0 (0 – 0) | 0 (0 – 0) | 0.845 |
| Postop QoL (median, IQR) | 1 (0 – 2) | 1 (0 – 2) | 0.835 |
| Postoperative urinary incontinence | 8 (13.2%) | 20 (15.9%) | 0.911 |
| No incontinence | 53 (86.8%) | 106 (84.1%) | / |
| Urge incontinence | 4 (6.6%) | 10 (7.9%) | |
| Stress incontinence | 4 (6.6%) | 8 (6.4%) | |
| Mixed incontinence | 0 (0%) | 2 (1.6%) | |
| Overflow incontinence | 0 (0%) | 0 (0%) | |
| Hemoglobin drop (preop. Hb – postop. Hb) (g/dL) | - 0.80 (- 1.50 – - 0.00) | - 0.65 (- 1.90 – - 0.20) | 0.458 |
| Early (within 1 month) surgical complications according to Clavien Dindo(n, %) | 8 (13.1%) | 20 (15.9%) | 0.313 |
| *CL. complications <2 n (%)* | 8 (13.1%) | 18 (14.4%) | / |
| CL. complications >=2 n (%) | 0 (0%) | 2 (1.5%) | |
| Delayed (after 1 month) surgical complications according to Clavien Dindo (n, %) | 3 (4.9%) | 10 (7.9%) | 0.218 |
| *CL. complications <2 n (%)* | 3 (4.9%) | 10 (7.9%) | 0.83 |
| *CL. complications >=2 n (%)* | 0 (0%) | 0 (0%) | |

**Table 2**: Perioperative and postoperative functional outcomes of patients treated with HoLEP

**Discussion:** In our experience HoLEP seems to require more energy delivery and operative time in patients with a high comorbidity burden, although it represents a safe and effective procedure for the treatment of BPH in this cohort of patients.

## SC14 Partially versus totally en-bloc no-touch low-power HoLEP: Equivalent efficiency and safety

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**Aim of the study:** Holmium Laser Enucleation of the Prostate (HoLEP) is a safe and effective miniinvasive procedure for benign prostatic obstruction (BPO) treatment, relying on the endoscopic anatomic enucleation of the prostatic adenoma. Since 2012 we progressively modified the traditional 3-lobe technique introducing: a) the partially en-bloc enucleation of the adenoma, obtaining a single horseshoe-shaped specimen by means of a single 5 o'clock vertical incision from the bladder neck to the left side of the veru montanum; b) the no-touch approach, taking advantage of the vaporizing plasma bubble generated at the tip of the laser fiber at 2–3 mm from the tissue; c) the low-power setting, delivering less energy to the capsular plane, to minimize postoperative dysuria. The latest evolution has been the totally en-bloc enucleation, maintaining the no-touch low-power approach, with no vertical incisions of the prostatic urethra, early release of the sphincteric mucosa and late opening of the bladder neck. The aim of the present work was to compare efficiency and safety of partially and totally en-bloc HoLEP.

**Materials and methods:** 242 patients suffering from BPO (inadequate response or intolerance to medical therapy, any prostate volume, no prostate cancer, Qmax <15 ml/sec, IPSS score >10, PVR <300 cc) underwent en-bloc no-touch low-power HoLEP in our Department previous informed consent. Group 1 (07/2015–02/2017) included 108 patients operated with the partially en-bloc approach, group 2 (02/2017–09/2018) 134 patients operated with the totally en-bloc approach. The 50 W Auriga XL holmium laser device (Boston Scientific), settings 2.2 J energy, 18 Hz frequency, long pulse length, and the Storz morcellator were mainly used. Patients' demographics and clinical data were prospectively registered and correlated using the Student's t-test.
**Results:** Mean age was similar in both groups (68 years +/– 8 ds vs 70 years +/– 7 ds). Intraoperative parameters were equivalent, except for a slight increase in efficiency in group 2. In both cases efficiency was lower for small adenomas (<30 g), particularly high (>2 g/min) for large ones (>80 g). In group 1 ( partially en-bloc) real adenoma weight was 45 g +/– 32 ds, energy used 59 kJ +/– 33 ds, enucleation time 34 min +/– 19 ds, efficiency 1.3 g/min +/– 0.7 ds (g/min), morcellation time 8.3 min +/– 7.4 ds. In group 2 (totally en-bloc) real adenoma weight was 51 g +/– 35 ds, energy used 55 kJ +/– 22 ds, enucleation time 32 min +/– 12 ds, efficiency 1.5 g/min +/– 0.7 ds (g/min), morcellation time 8.4 min +/– 7.3 ds. Global complication rates were also similar (11% group 1 versus 10.5% group 2), with about 7% of Clavien 1 in both cases (urinary retention +/– hematuria, fever), 0.7–1% Clavien 2 (blood transfusions), 3% Clavien 3a (hemostatic endoscopic revision), no Clavien grade 3b, 4 or 5.
**Discussion:** Partially and totally en-bloc no-touch low-power HoLEP are equally feasible, safe and efficient, particularly in case of large adenomas.

## SC15 Does learning curve affect perioperative safety and early functional outcomes after HoLEP? Single surgeon experience in a referral academic centre

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**Aim of the study:** Holmium laser enucleation of the prostate (HoLEP) is a safe and effective option for the treatment of patients with benign prostatic hyperplasia (BPH). Despite its increasing adoption, this procedure has a steep learning curve and requires endoscopic skills. In this study we evaluated the impact of learning curve on perioperative and early functional outcomes after HoLEP in a referral academic Centre.
**Materials and methods:** Data from patients undergoing HoLEP from March 2017 to January 2019 were prospectively collected. All procedures were performed by a single experienced endoscopic surgeon. The learning curve phase was divided into three consecutive surgical eras (first 25 cases; 25–50 cases; >50 cases). Preoperative characteristics, including functional questionnaires [IPSS, IIEF-5, OAB-q, ICIQ-sf, stress urinary incontinence (SUI), QoL] and clinical parameters (i.e. prostate volume, PSA, uroflowmetry), perioperative data, as well as follow-up data 3 months after surgery were collected into our institutional database. Study endpoints were operative time, length of hospital stay, surgical complications and 3-mo functional outcomes.
**Results:** Overall, 137 patients were included. Preoperative characteristics (including age, BMI, comorbidity status, prostate volume, IPSS, IIEF-5, OAB-q and ICIQ-sf scores) were comparable among patients in the different surgical eras ($p > 0.05$) (table 1). No conversion to open prostatectomy or bipolar TURP were recorded. Both median enucleation and morcellation time showed a progressive decrease throughout the three eras [63, 50 and 45 minutes, respectively; $p < 0.001$ and 33, 25 and 18 minutes, respectively; $p = 0.009$). Consequently, median overall surgical time was significantly longer in the first era as compared to the following ones (120 vs 95 vs 90, $p = 0.03$). Median time to catheter removal (4 vs 3 vs 3 days, $p = 0.01$) and hospital stay (5 vs 4 vs 4 days, $p = 0.013$) were also significantly different. Early (30-days) surgical complications rate was significantly different among the three groups [8 (32.0%) vs 5 (20.0%) vs 8 (9.2%), $p = 0.02$]; on the contrary, the rate of delayed (1–3 months) surgical complications were comparable [2(8%) vs 1 (4%) vs 5(5.7%); $p = 0.83$]. In detail, transfusion rate was significantly higher in the first surgical era compared to the following eras (8% vs 0% vs 0%, respectively, $p = 0.01$). At a 3 months follow-up, improvement in Qmax, IPSS, OAB and QoL scores did not differ across all the learning curve phases (all $p > 0.05$) (table 2).
**Discussion:** Our preliminary experience suggests that learning curve might significantly affect both enucleation and morcellation times, as well as early surgical complications rate and length of hospital stay. On the contrary, the learning curve seems not to impact on early functional outcomes and quality of life after HoLEP.

**Table 1**: Preoperative and surgical features in patients treated with HoLEP

| Variables | Learning curve eras | | | p-value |
|---|---|---|---|---|
| | < 25 cases | 25-50 cases | > 50 cases | |
| **Preoperative features** | | | | |
| Age (years) (median, IQR) | 73 (67 – 77) | 69 (65 – 74) | 70 (64 – 74) | 0.339 |
| BMI (kg/m^2) (median, IQR) | 24.8 (22.9 – 30.4) | 25.8 (24.2 – 28.1) | 26.1 (24.6 – 29.2) | 0.330 |
| Charlson Comorbidity Index (median, IQR) | 3 (3 – 5) | 3 (2 – 4) | 3 (2 – 4) | 0.470 |
| Prostate volume (mL) (median, IQR) | 85 (71 – 108) | 105 (80 – 130) | 100 (85 – 120) | 0.180 |
| Preop Q max (mL/s) (median, IQR) | 8.6 (8.1 – 10.6) | 8.0 (6.9 – 9.7) | 8.4 (7.5 – 10.0) | 0.206 |
| Preop Post voiding residual (mL) (median, IQR) | 90 (50 – 265) | 238 (100 – 600) | 160 (90 – 285) | 0.225 |
| Preop PSA (ng/mL) (median, IQR) | 5.67 (3.50 – 8.94) | 5.49 (3.80 – 8.70) | 4.65 (2.13 – 7.15) | 0.913 |
| Preop IPSS (median, IQR) | 25 (22 – 28) | 23 (22 – 27) | 25 (20 – 30) | 0.197 |
| Preop IIEF-5 (median, IQR) | 20 (12 – 22) | 17 (15 – 20) | 18 (12 – 22) | 0.323 |
| Preop OAB-q (median, IQR) | 47 (37 – 50) | 42 (27 – 51) | 45 (34 – 66) | 0.603 |
| Preop ICIQ-sf (median, IQR) | 0 (0 – 0) | 0 (0 – 0) | 0 (0 – 3) | 0.589 |
| Preop QoL (median, IQR) | 4 (4 – 5) | 4 (4 – 5) | 4 (3 – 5) | 0.507 |
| **Surgical features** | | | | |
| Enucleation time (min) (median, IQR) | 63 (55 – 70) | 50 (45 – 60) | 45 (40 – 55) | 0.001 |
| Morcellation time (min) (median, IQR) | 33 (15 – 50) | 25 (15 – 35) | 18 (15 – 25) | 0.009 |
| Overall surgical time (min) (median, IQR) | 120 (90 – 135) | 95 (80 – 120) | 90 /70 – 110) | 0.032 |
| Energy adopted (kJ) (median, IQR) | 150,990 (124,608 – 185,548) | 133,461 (112,674 – 161,886) | 135,408 (114,916 – 164,171) | 0.254 |
| Lasing time (min) (median, IQR) | 40 (32 – 44) | 35 (30 – 40) | 33 (29 – 39) | 0.117 |