

## DAY CASE GREENLIGHT LASER PHOTOSELECTIVE VAPORISATION OF THE PROSTATE (GL-PVP): EVALUATION OF OUTCOMES FROM A DISTRICT GENERAL HOSPITAL EXPERIENCE OF 538 CASES

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### Abstract

#### Background and Objective

In recent years, GreenLight laser photoselective vaporisation of the prostate (GL-PVP) has emerged as the primary ablative surgical treatment option for symptomatic bladder outlet obstruction (BOO) secondary to benign prostatic enlargement (BPE). Unlike the reference procedure, monopolar-transurethral resection of the prostate (M-TURP), GL-PVP can be performed as a day case. As waiting list pressures continue to burden health boards across the UK, exacerbated by the COVID-19 pandemic, enhanced access to day case surgery to optimise patient flow is now of paramount importance. We evaluated the safety and feasibility of day case GL-PVP at our high-volume UK centre and identified predictors of a postoperative overnight stay.

#### Material and Methods

We performed a retrospective observational cohort study of all patients who underwent primary GL-PVP at a single institution between October 2016 and June 2021. All procedures were performed utilising the 180W GreenLight XPS™ laser therapy system. Various clinical, operative and functional data were collated, and outcomes were compared between patients who underwent day case surgery and those admitted overnight postoperatively.

#### Results

In all, 538 patients underwent GL-PVP during the study period. Median patient age was 72 (interquartile range (IQR) 66–77), and median prostate volume was 62.5cc (IQR 45–90). Five hundred nineteen patients (96.5%) were discharged within 23 hours of admission, and 366 patients (68.0%) were managed as a true day case. Operative and functional outcomes were comparable between patients managed as a day case and those admitted overnight. There was higher patient-reported satisfaction and a lower rate of early hospital readmission in the day-case group. On univariate logistic regression analysis, patients aged  $\geq 80$  years (Odds Ratio 2.64 [95% Confidence Interval 1.65–4.24],  $p < 0.001$ ), those with American Society of Anaesthesiologists (ASA) physical status classification score  $\geq 3$  (OR 1.92 [95% CI 1.33–2.78],  $p < 0.001$ ), those with prostate volume  $\geq 80$ cc (OR 1.62 [95% CI 1.00–2.61],  $p = 0.05$ ) and those in whom the operation time  $\geq 60$  minutes (OR 1.66 [95% CI 1.10–2.52],  $p = 0.02$ ) were more likely to be admitted overnight following GL-PVP. On multivariate logistic regression analysis, age  $\geq 80$  (OR 2.64 [95% CI 1.47–4.73],  $p = 0.001$ ) and ASA score  $\geq 3$  (OR 2.03 [95% CI 1.28–3.22],  $p = 0.003$ ) remained predictive variables of an overnight stay.

## Conclusion

From our observations of a large cohort of patients over a study period of almost five years, day case GL-PVP is a feasible concept and does not appear to compromise perioperative outcomes. With appropriate service redesign and optimisation of postoperative patient pathways, day case GL-PVP can be established in other centres and may have a role in alleviating waiting list pressures.

**Key words:** *BPH, GreenLight PVP, Day Case Surgery, Service Development*

## INTRODUCTION

Symptomatic benign prostatic obstruction (BPO) is an important global health issue,<sup>1</sup> and with a rising prevalence, bladder outlet surgery is likely to encompass a significant proportion of the workload of urological surgeons worldwide in the coming years<sup>2</sup>. Various novel surgical techniques have emerged in recent decades, of which GreenLight Photoselective Vaporisation of the Prostate (GL-PVP) has been established as the primary ablative modality. This is supported by an ever-expanding body of data demonstrating operative and functional outcomes at least equivalent to the reference procedure-monopolar transurethral resection of the prostate (M-TURP).<sup>3-4</sup> The advantages of GL-PVP over M-TURP include its superior haemostatic properties and elimination of TUR syndrome, a potentially life-threatening dilutional hyponatraemia induced by systemic absorption of the hypotonic irrigating solution.<sup>5-6</sup> These benefits allow GL-PVP to be performed as a “day case” procedure, unlike M-TURP which usually necessitates an inpatient admission of two postoperative days.

With the National Health Service (NHS) in the United Kingdom (UK) under increasing strain, exacerbated by waiting list pressure consequent to the Coronavirus disease 2019 (COVID-19) pandemic, enhancing the efficiency of existing treatment pathways is now of paramount importance. In recent years we have witnessed the increasing acceptance and provision of “day case” surgery - defined as cases in which patients attend hospital, undergo an elective surgical procedure, and are discharged before midnight on the same calendar day.<sup>7</sup> The benefits to patients include the

opportunity to recuperate from surgery in their own home and a reduced risk of complications, including hospital-acquired infection (HAI) and venous thromboembolism (VTE).<sup>8</sup> For the health service, performing day case operations in dedicated centres allows the reservation of inpatient beds for emergency cases and patients undergoing major operations and, consequently, cancellation of day cases is less likely. These factors allow health boards to optimise patient flow and ease the burden on waiting lists.<sup>9</sup> The formation of the British Association of Day Surgery (BADs) in 1989 and the International Association for Ambulatory Surgery (IAAS) in 1995 generated a drive towards enhancing the provision of day case surgery, and the Department of Health and Social Care (DHSC) has now proposed that 75% of all elective surgery should be performed as a day case. In NHS England guidance<sup>10</sup> published in November 2020, it was suggested that 80% of laser prostate procedures should be performed as a day case; however, only 7.5% of endoscopic laser prostate operations were performed as day cases throughout NHS England in 2018/2019.

We aimed to evaluate the safety and feasibility of performing GL-PVP as a day case procedure at our high-volume institution by comparing operative and functional outcomes in patients managed as a day case with those who remained in hospital overnight postoperatively.

## MATERIAL AND METHODS

### *Study population*

A prospectively collected theatre logbook and the Centricity™ Opera (GE Healthcare, Chicago, IL, United States) electronic theatre database for our elective care institution – the Queen Margaret Hospital,

Dunfermline – were used to identify all patients who underwent GL-PVP between October 2016 and June 2021 inclusive. Patients who underwent GL-PVP on NHS operating lists in private healthcare institutions during the early stages of the COVID-19 pandemic (March to August 2020) and those who underwent revision GL-PVP procedures were excluded from the analysis. All procedures were performed utilising the 180W GreenLight XPS™<sup>11</sup> (Boston Scientific, Marlborough, MA, United States) laser therapy system with a MoXy™ (Boston Scientific) liquid-cooled disposable laser fibre.

### Data acquisition

Baseline data collated included patient demographics and details on clinical presentation, pre-operative functional metrics (maximal urinary flow rate (Qmax) and post-void residual bladder volume (PVR)), prostate volume (PV) and prostate-specific antigen (PSA) measurements, and each patient's American Society of Anaesthesiologists (ASA) physical status classification score. In addition, we acquired various intra-operative data, including method of anaesthesia, operative time and laser energy delivery, and postoperative data including length of hospital stay (LOS), trial without catheter (TWOC) success rate, early ( $\leq 30$  days) postoperative complications and follow-up functional metrics including patient satisfaction. These data were obtained through retrospective review of regional electronic patient records (Orion Health Clinical Portal software (Orion Health, Auckland, New Zealand) and the operating theatre logbook and electronic theatre database.

### Statistical analysis

Differences in baseline characteristics and the various intra- and postoperative variables and outcomes between patients managed as a day-case and those who remained in hospital overnight were evaluated using Student's t-test, the Mann-Whitney U test, and  $\chi^2$  tests appropriate. In addition, univariate and multivariate logistic regression analysis was performed to evaluate if the patient or operative covariates were independently predictive of overnight stay following GL-PVP. With all tests, a two-sided p-value of  $\leq 0.05$  was considered statistically

significant. All statistical analyses were performed using the software JASP (JASP Team 2020; Version 0.14.1).

## RESULTS

From October 2016 to June 2021 inclusive, 538 consecutive patients underwent primary GL-PVP with all operations performed or supervised by one of seven consultant urological surgeons. As displayed in **Table 1**, over half of patients (54.5%) underwent surgery for refractory lower urinary tract symptoms (LUTS), 219 patients (40.7%) were in catheter-dependent urinary retention, and 19 patients (3.5%) were performing intermittent self-catheterization (ISC). Throughout the study period, over two-thirds of patients (366/538 (68.0%)) were managed as a true day case, and 519 patients (96.5%) were discharged within 23 hours of admission (**Table 2**). For the 19 patients (3.5%) who remained in hospital beyond 23 hours, the median length of stay (LOS) was 2 days, ranging from 1 day to 9 days.

**Table 3** displays the baseline descriptive and functional metrics of patients managed during the study period, with comparisons between those treated as a day case and those who remained in hospital for at least one night. There was a significant difference in median age (71 years vs. 73 years,  $p < 0.001$ ) and prostate volume (60cc vs. 65cc,  $p = 0.03$ ) between the groups of patients. Baseline

**Table 1.** Indication for Surgery

<i>Indication</i>	<i>All (n = 538) (n [%])</i>	<i>Day Case (n = 366) (n [%])</i>	<i>Non-Day-Case (n = 172) (n [%])</i>
LUTS	293 (54.5)	207 (56.6)	86 (50)
AUR	108 (20.1)	67 (18.3)	41 (23.8)
LPCR	50 (9.3)	30 (8.2)	20 (11.6)
HPCR	84 (15.6)	59 (16.1)	25 (14.5)
Other	3 (0.6)	3 (0.8)	0

LUTS=lower urinary tract symptoms; AUR=acute urinary retention; LPCR=low-pressure chronic urinary retention; HPCR=high-pressure chronic urinary retention \*denotes statistically significant result

**Table 2.** Day Case Proportion Stratified by Year of Surgery

Year	Case Number	Day Case (n = 366) (n [%])	Non-Day-Case (n = 172) [n(%)]
2016	25	18 (72)	7 (28)
2017	141	104 (73.8)	37 (26.2)
2018	122	77 (63.1)	45 (36.9)
2019	94	61 (64.9)	33 (35.1)
2020	89	62 (69.7)	27 (30.3)
2021	67	44 (65.7)	23 (34.3)

functional metrics were comparable between the two groups. However, there was a significantly higher proportion of patients with ASA score of 3 or greater in the cohort of patients who remained

in hospital overnight compared with the day case group (88 [51.2%] vs. 129 [35.2%],  $p < 0.001$ ).

As displayed in **Table 4**, we drew comparisons of various operative and functional metrics between the two groups of patients. In all, 15 patients (2.8%) underwent intra-operative conversion to TURP, with 13 (86.7%) of these cases during the first two years of the study period. Patients who underwent conversion to TURP were significantly more likely to remain in hospital overnight (OR 6.44, 95% CI 2.02–20.57,  $p = 0.002$ ). The median day for the first postoperative trial without catheter (TWOC) was day 4, and the first TWOC success rate was 89.0%. Of the 59 patients (11.0%) who failed to void at the initial TWOC, 28 (47.5%) successfully voided at subsequent TWOC attempts, equating

**Table 3.** Descriptive Characteristics of Patients Who Underwent GL-PVP During the Study Period With Comparisons Made Between Day Case and Non-Day-Case Groups

Baseline metrics [data available]	All (n = 538) [Median (IQR)]	LOS				p-value
		Day Case (n = 366)		Non-Day-Case (n = 172)		
		Patients (n)	Median (IQR)	Patients (n)	Median (IQR)	
Age (years) [n = 538]	72 (66–77)	366	71 (65–76)	172	73 (67–80)	<0.001*
Prostate volume (cc) [n = 372]	62.5 (45–90)	255	60 (45–85)	117	65 (47–100)	0.03*
PSA (ng/mL) [n = 455]	2.3 (1.3–4.4)	306	2.3 (0.1–14.9)	149	2.4 (0.1–16.2)	0.10
PSAD (ng/mL/cc) [n = 368]	0.04 (0.02–0.07)	253	0.03 (0.01–0.07)	115	0.04 (0.02–0.7)	0.09
Qmax (mL/s) [n = 245]	8.3 (5.6–11.8)	175	8.60 (5.45–12.0)	70	8.25 (6.30–10.4)	0.10
PVR (mL) [n = 336]	202 (70–600)	241	190 (70–600)	95	185 (53–487)	0.54
ASA score	All (n = 538) [n (%)]	Patients (n)	Proportion (%)	Patients (n)	Proportion (%)	p-value
1	26 (4.8)	22	6.0	4	2.3	0.06
2	295 (54.8)	216	58.7	80	46.5	0.008*
3	209 (38.8)	126	34.4	83	48.3	0.002*
4	8 (1.5)	3	0.8	5	2.9	0.06

GL-PVP = GreenLight laser photoselective vaporisation of the prostate; IQR = interquartile range; LOS = length of stay; PSA = prostate specific antigen; PSAD = prostate specific antigen density; Qmax = maximal urinary flow rate; PVR = post-void residual volume; ASA = American Society of Anaesthesiologists Physical Classification Score

\*denotes statistically significant result

**Table 4.** Outcomes of Patients Who Underwent GL-PVP During the Study Period With Comparisons Made Between Day Case and Non-Day-Case Groups

Variable [data available]	All (n = 538) [Median (IQR)/n(%)]	LOS				p-value	
		Day Case (n = 366)		Non-Day-Case (n = 172)			
		Patients (n)	%/Median (IQR)	Patients (n)	%/Median (IQR)		
<b>Intra-operative metrics</b>							
General anaesthesia	473 (87.9)	326	89.1	147	85.5	0.23	
Spinal anaesthesia	65 (12.1)	40	10.9	25	14.5		
Laser energy delivery (kilojoules) [n = 537]	162.5 (108.9–234.7)	365	160.9 (107.1–232.0)	172	171.5 (122.9–249.7)	0.15	
Operation time (minutes) [n = 530]	45 (34–58)	361	44 (33–56)	170	46 (37–64)	0.02*	
Laser time (minutes)	17.8 (12.3–25.4)	366	17.3 (11.9–24.9)	172	18.9 (13.6–26.5)	0.12	
Conversion to TURP	15 (2.8)	4	1.1	11	7.1	<0.001*	
<b>Early (&lt;30 day) post-operative outcomes</b>							
TWOC day [n = 537]	4 (2–5)	365	4 (3–5)	172	4 (2–5)	–	
Success of initial TWOC [n = 536]	479 (89.0)	334	91.5	144	84.2	0.01*	
Hospital readmission	46 (8.6)	16	4.4	30	17.4	<0.001*	
Complication grade	Clavien-Dindo 1	19 (3.5)	5	1.4	14	8.1	–
	Clavien-Dindo 2	26 (4.8)	11	3.0	15	8.7	
	Clavien-Dindo 3	1 (0.2)	0	–	1	0.6	
<b>Functional outcomes</b>	<b>Median follow-up (IQR) [months]</b>						
Qmax (mL/s) [n = 209]	4 (3–7)	17.8 (12.4–24.6)	149	19.2 (13.7–26.0)	60	15.2 (12.1–20.2)	0.005*
PVR (mL) [n = 251]	4 (3–7)	43 (12–101)	174	42 (13–100)	77	46 (3–117)	0.82
Patient satisfaction [n = 400]	4 (3–7)	339 (84.8)	233	89.6	106	81.6	0.03*
Reoperation [n = 533]	27 (13–43)	39 (7.2)	21	5.7	18	10.5	0.04*

GL-PVP = GreenLight laser photoselective vaporisation of the prostate; TURP = transurethral resection of prostate; TWOC = trial without catheter; LOS = length of stay; Qmax = maximal urinary flow rate; PVR = post-void residual volume

\*denotes statistically significant result

to an overall postoperative TWOC success rate of 94.2%, including five patients who continued ISC for a period postoperatively to manage persistent high PVR volumes. Of the 31 patients (5.8%) who failed to void spontaneously, 25 (80.6%) had been catheter-dependent pre-operatively, and 3 (9.7%) were performing intermittent-self-catheterization for low-pressure chronic urinary retention.

In all, 46 patients (8.6%) were referred to hospital, either for assessment in the acute surgical receiving unit or for admission to the inpatient ward, within 30 days of surgery (**Table 4**). Of these patients, all but one who underwent an emergency bladder washout under general anaesthesia for persistent haematuria developed a grade one or grade two complication as classified by the Clavien-Dindo system. Of the 19 patients (3.5%) who were managed for a grade one complication, persistently visible haematuria managed conservatively was the most common (n = 9), followed by acute urinary retention (n = 7). Of the remaining three patients in this cohort, one suffered a CT-confirmed paravesical haematoma managed conservatively, and two patients developed cardiac arrhythmias postoperatively, necessitating admission for non-invasive cardiac monitoring. Twenty-six patients (4.8%) developed a grade two complication, of whom 19 (73.1%) underwent oral or intravenous antimicrobial therapy for a urinary tract infection (UTI) or signs of urinary sepsis, with the remainder treated for epididymo-orchitis (n = 3), pneumonia (n = 2), COVID-19 pneumonitis (n = 1) and staphylococcus aureus bacteraemia (n = 1). We observed a higher rate of complications necessitating hospital assessment or admission in patients who had remained in hospital overnight postoperatively (OR 4.62, 95% CI 2.44–8.74,  $p < 0.001$ ), likely confounded by the higher prevalence of comorbidities in this patient cohort. Throughout the study period, eleven patients (2.0%) developed clinical signs of urinary sepsis

necessitating intravenous antimicrobial therapy within 30 days of surgery, of whom only one patient had confirmed bacteraemia.

At a median follow-up of 4 months, from the 400 patients (74.3%) with available data, 339 patients (84.8%) reported satisfaction with the outcome of their operation, and at a median 27-month follow-up, 39 patients (7.2%) underwent a reoperation. Urethral dilatation or optical urethrotomy was the most common reoperation (n = 11) followed by re-do GL-PVP (n = 9), TURP (n = 9), bladder neck incision (n = 5), intra-detrusor botulinum toxin injection for persistent overactive bladder symptoms (n = 3) and suprapubic catheter insertion (n = 2). We observed that patient-reported satisfaction was higher (89.6% vs. 81.6%,  $p = 0.03$ ) and reoperation rate lower (5.7% vs. 10.5%,  $p = 0.04$ ) in the group of patients managed as a day case compared to those who remained in hospital overnight.

On univariate logistic regression analysis, patients aged  $\geq 80$  years (OR 2.64 [95% CI 1.65–4.24],  $p < 0.001$ ), ASA score  $\geq 3$  (OR 1.92 [95% CI 1.33–2.78],  $p < 0.001$ ), those with prostate volume  $\geq 80$ cc (OR 1.62 [95% CI 1.00–2.61],  $p = 0.05$ ) or those in whom the operation time  $\geq 60$  minutes (OR 1.66 [95% CI 1.10–2.52],  $p = 0.02$ ) were more likely to be admitted overnight following GL-PVP (**Table 5**). On multivariate logistic regression analysis, age  $\geq 80$  years (OR 2.64 [95% CI 1.47–4.73],  $p = 0.001$ ) and ASA score  $\geq 3$  (OR 2.03 [95% CI 1.28–3.22],  $p = 0.003$ ) remained predictive of an overnight stay.

**Table 5.** Logistic Regression Analysis of Factors Predictive of an Overnight Stay Following GL-PVP

Variable (n)	Univariate			Multivariate		
	OR	95% CI	p-value	OR	95% CI	p-value
Age $>80$ years (84)	2.64	1.65–4.24	$<0.001^*$	2.64	1.47–4.73	0.001*
Chronic urinary retention (134)	1.10	0.73–1.67	0.64			
ASA $\geq 3$ (217)	1.92	1.33–2.78	$<0.001^*$	2.03	1.28–3.22	0.003*
Spinal anaesthesia (65)	1.39	0.81–2.37	0.23			
Prostate volume $\geq 80$ cc (102)	1.62	1.00–2.61	0.05*	1.18	0.79–2.30	0.28
Operation time $\geq 60$ minutes (125)	1.66	1.10–2.52	0.02*	1.42	0.83–2.43	0.20

ASA=American Society of Anaesthesiologists Physical Classification Score; OR=odds ratio; CI=confidence interval

\*denotes statistically significant result

## DISCUSSION

From our evaluation of outcomes from over 500 cases throughout a study period of almost five years, we observed that in the presence of an efficient service and an appropriately-designed patient pathway, GL-PVP can safely be performed as a day case without compromising perioperative and functional outcomes or length of postoperative catheterisation. We observed that patients aged 80 years or older with comorbidities equating to an ASA score of 3 or higher were significantly more likely to remain in hospital overnight; however, our data suggest that a significant proportion of these patients may, with thorough preoperative planning, have been safely managed as day cases. To our knowledge, this is the largest study to evaluate outcomes of day case GL-PVP and to determine specific variables which may predict patients who remain in hospital postoperatively.

The importance of a robust and streamlined patient pathway in the successful delivery of day case surgery cannot be understated. Managing patients as day cases at our elective care institution is customary, so an efficient patient pathway is in place to achieve this. At the pre-assessment clinic patients are assisted in making appropriate provisions, for example, pre-arranging transport from hospital following their procedure. Postoperatively, there is an accepted protocol whereby patients can be discharged if they fulfil various nurse-led criteria. Specific to the day case GL-PVP pathway is the facilitation of a planned outpatient TWOC service. Our institution has established an efficient pathway to manage these cases whereby the elective care centre contacts the nurse-led urology unit before patient discharge, and an appointment date and time is arranged to remove the patient's catheter. This allows patients to be discharged with a 18Ch three-way Foley catheter in situ and a plan to return to the clinic for their specified appointment. We acknowledge that not all centres have the facility or the pathways in place to facilitate this service; however, with appropriate service redesign and staff training we believe our system can be reproduced nationally.

We accept that, over the study period, whilst two-thirds of our patients were successfully managed as a day case and this significantly exceeds the national average, it falls short of the guidelines laid out by BADS and the DHSC<sup>12,13</sup> and our department continues to review and improve the service as it strives to achieve the national target. Undoubtedly there are cases when patients must remain in hospital overnight – for example, in the frail population who may live alone or when patient transport is not available – however from our observations, it appears reasonable to consider day case GL-PVP in most patients who undergo this operation, and our data has led to review of and improvement to our service. Furthermore, although we identified predictors of overnight admission, ultimately, the decision on whether a patient can be managed safely as a day case lies with the operating surgeon and anaesthetist. During the study period, patients were managed under the care of seven consultant urological surgeons and numerous anaesthetists, and it is likely that some clinicians are more likely than others to advocate day case GL-PVP. It may have been an interesting sub-analysis to investigate inter-surgeon variability in practise over time as each surgeon advanced their caseload in this operation.

Existing data regarding day case GL-PVP is sparse. Chen et al<sup>12</sup> evaluated outcomes in high-risk populations and identified a longer LOS in anticoagulated patients. However, this data was derived from cases performed using the inferior 120W system and is not directly comparable with our analysis as we did not evaluate the impact of prior anticoagulation on LOS in our cohort. Furthermore, Woo et al<sup>13</sup> investigated the impact of prostate volume on perioperative outcomes and observed a length of stay of under 23 hours in the majority of patients with LOS unaffected by prostate volume – consistent with our data.

Day case surgery has been established in various other novel bladder outlet procedures. For example, Larner et al<sup>14</sup> evaluated outcomes in Holmium Laser Enucleation of the Prostate (HoLEP), an alternative laser procedure normally reserved for large prostate glands ( $\geq 80$  cc) and reported positive operative and

functional outcomes in patients managed as a day case – albeit in a dataset of patients with gland volumes limited to  $\leq 60$ cc. More recent data on day case HoLEP published by Lee et al<sup>15</sup> ascertained those patients with smaller glands ( $\leq 40$ cc) and those who underwent surgery in the morning were more likely to be successfully managed as day cases. The timing of surgery was not a variable we considered but could be an interesting factor to consider in future prospective analyses. Finally, Klein et al<sup>16</sup> evaluated outcomes from 266 patients who underwent HoLEP by a single surgeon and concluded it was both safe and efficacious to operate a day case, with prostate volume  $\geq 90$ cc the only independent predictor of an overnight stay. The precise cost-benefit of performing day case surgery depends on the specific operation and various costs unique to each health board, and we did not perform a cost analysis as part of our study. However, Audit Scotland<sup>17</sup> has suggested that the cost of a day case operation is up to 50% less than if the same operation was performed as an inpatient case. As an approximate estimate, according to the National Schedule of NHS England Costs<sup>18</sup> report for year 2019-20, the mean cost of a transurethral prostate procedure ranges from £2474-£2636 for a day case operation to £3420-£4007 for an inpatient case; equating to a saving of between 27.7% and 34.2% in favour of day case surgery. Given the potentially significant financial benefits to the health service, developing and enhancing provision to day case surgery should remain a target for health boards across the UK in the coming years.

We acknowledge the limitations of our study. Firstly, there are, undoubtedly, inherent limitations associated with retrospective single-institution observational cohort studies, including missing data for some patients, which must be considered in the interpretation of our observations - despite our robust data collection methodology to minimise selection bias. Secondly, it is possible that specific postoperative outcomes – for example, patient presentation to primary care with early complications – may not have been captured by our retrospective electronic case note review. Finally, a small cohort of patients were followed up out of region postoperatively, and

this precluded early or long-term follow-up of these patients, with consequent gaps in the dataset.

## CONCLUSIONS

We observed that day case GL-PVP is a safe and feasible concept associated with positive perioperative and early postoperative outcomes. With appropriate service redesign to optimise postoperative patient pathways, day case GL-PVP can be established in other centres and may assist to fulfill national targets and alleviate the burden on national waiting lists.

## GRANT SUPPORT

Not applicable

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