

**A Survey of Morcellator Preference and Cost Comparison of the Lumenis®  
VersaCut™ and Wolf Piranha Morcellators**

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**Word Count:**

Abstract: 250  
Text: 1860  
Tables: 2  
Figures: 5

**Running head:** HoLEP and Morcellation

**Key Words:** Morcellation, HoLEP, Cost

## Abstract

### Objectives:

To evaluate OR costs associated with the two available morcellators in the United States in a matched cohort and to determine BPH surgeon's morcellator preference.

### Materials and methods:

Patients from 2013, the last year our institution exclusively used the VersaCut™ device were matched 1:1 with the most recent patient cohort, utilizing the Wolf Piranha morcellator. Cost of morcellation including the expense of OR time and disposable instrument costs was calculated. A survey to the Endourological Society email listserv was sent to determine morcellator preference.

### Results:

We identified 142 patients who underwent HoLEP in 2013. When compared with the VersaCut™ group, morcellation efficiency (4.4 versus 7.0 g/min,  $p < 0.01$ ) and expense of OR time (\$1420.80 versus \$992.21,  $p < 0.005$ ) both favored the Piranha morcellator system even when the costs of disposable instruments were factored in to the analysis (\$1338.81 versus \$1637.50,  $p < 0.05$ ).

A total of 126 urologist responded to the survey. Of these, 56 (44.5%) perform transurethral prostate enucleations, which included 48 (86%) holmium. More endourologists use the VersaCut™ (n= 33, 59%) than the Piranha (n=24, 43%) morecellator. Qualities that impacted the preference of morcellator included: the preferred device is safer, faster, easier to use, reusable, and less expensive.

Conclusion:

We identified a significant improved efficiency and improved cost savings utilizing the Piranha morcellator even when controlling for disposable costs. Of the endourologists that responded to the survey less than half perform transurethral enucleation.

Morcellator preference is largely based on safety, efficiency, and ease of use, while cost and reusability were of lesser importance.

## Introduction

Holmium laser enucleation of the prostate (HoLEP) has superior outcomes than traditional transurethral resection and has steadily increased in popularity since its introduction almost twenty years ago.<sup>1-4</sup> HoLEP represents a versatile, well investigated surgery for benign prostatic hyperplasia (BPH), with virtually any size prostate amenable to treatment, including those prostates previously unsuccessfully treated by other modalities.<sup>4 5</sup>

HoLEP involves two procedures: enucleation and morcellation. Although much of the previous literature surrounding HoLEP addresses efficiency of enucleation, morcellation also plays a vital role in overall procedural time.<sup>6</sup> While initial investigation noted inefficient morcellation,<sup>1</sup> the rates of morcellation have improved; however, there are limited options with morcellation devices. Currently there are only two available models in the United States market: the Richard Wolf Piranha and the Lumenis VersaCut™. The VersaCut™ has a reciprocating

mechanism, which extends from the tip of the blade with a guillotine action to morcellate tissue, whereas the Piranha oscillates from side to side with a serrated blade and has a curved unexposed tip to prevent from inadvertent bladder injury.

A randomized trial reported by El Tayeb et al demonstrated comparable morcellation rates between the two devices with cost favoring the Lumenis device.<sup>7</sup> The finding of comparable rates between the two devices is at odds with prior in vitro studies and a recent in vivo investigation.<sup>8,9</sup> Furthermore, in the original study by El Tayeb et al. OR time and overall cost was not explored. With the recent availability of a second morcellation device in the United States we sought to determine the current preference of morcellator, as well as a more complete picture of cost and morcellation efficiency between the two devices.

### **Materials and Methods**

An institutional review board approved prospectively maintained database of HoLEP patients was utilized for this study. We evaluated all patients from 2013, the last year our institution exclusively used the VersaCut™ morcellator with reusable blades and matched them with the most recent patient cohort utilizing exclusively the Piranha morcellator with disposable blades. Patient demographics including age, renal function, pre-operative PSA, transrectal ultrasound (TRUS) volume, enucleation time, weight of morcellated tissue and morcellation time were recorded. Morcellation time was defined as the time from the start of tissue morcellation, indicated by the surgeon, until all tissue has been removed. This includes any time for troubleshooting the morcellator during use.

For the cost comparison, morcellation times were compared and multiplied by the institutional rate for OR time on a per minute basis specifically for the HoLEP procedure. Blade costs were calculated assuming three uses for the VersaCut™ morcellator blade (\$216.7 USD) and a single use for the Piranha (\$346.6 USD).

An online survey was sent to endourologists via the Endourological Society email listserv. Data collected included number of years in practice, number of enucleations performed annually, morcellator used, and morcellator preference. Qualities of a morcellator that impacted preference were also assessed on 1-5 Likert scale with 1 being least important and 5 being most important.

Statistical analysis utilizing student t-Test was performed evaluating differences in means regarding morcellation efficiency, cost of morcellation including the expense of OR time and disposable instrument costs. Fisher's exact was utilized for categorical data analysis. All analyses were performed using JMP®, Version 12.0. (SAS Institute Inc., Cary, NC, 1989-2007), using two-tailed testing with a significance level of 0.05.

## Results

We identified 142 patients within our institutional database that underwent HoLEP in 2013 with the VersaCut™ device and compared them to our most recent group of patients undergoing the same procedure with the Piranha from June 2015 to June 2016. There were 3 surgeons who performed the procedure during this time with fellows participating in the procedure. A single surgeon (JL) performed 233 of the procedures during this timeframe. There were no significant differences between the previous and most recent group with regards to patient age, pre-operative prostate specific antigen (PSA), renal function or pre-operative prostate volume.(Table 1)

Intraoperative variables are presented in Table 2. There was one identified small mucosal injury with the VersaCut; however, the injury did not result in prolonged catheter drainage, and no injuries were identified with the Piranha morcellator. The amount of tissue enucleated was similar between the two groups 72.8 grams vs. 77.7 grams,  $p=0.46$ . We noted significant improvements in morcellation efficiency (4.4 versus 7.0 g/min,  $p<0.01$ ) and OR time expense (\$1420.80 versus \$992.21,  $p<0.005$ ) both favoring the Piranha morcellator system. When the costs of disposable instruments were factored into the OR time cost analysis, total expense still favored the Piranha morcellator (\$1338.81 versus \$1637.50,  $p<0.05$ ).

Out of the greater than 2000 active members of the Endourological Society 126 endourologist responded to the survey. Of these, 56 (44.5%) perform

transurethral prostate enucleations, which included: 48 (86%) holmium, 8(14%)thulium, 4 (7%) bipolar, 2 (4%) photo, 2 (4%) plasma, 1 (2%) protouch laser, and 1(2%) diode. For morcellation, more endourologists use the VersaCut™ (n= 33, 59%) than the Piranha (n=24, 43%). Other methods of morcellation were used by 6 urologists including 4 who use a Storz Resectoscope. When assessing preference, more preferred the Wolf (n=29, 52%) compared to the Lumenis (n=23, 41%) and 44 (79%) use the morcellator they prefer. Reasons for not using the preferred device were the cost of operating the device (18%) or cost to acquire the device (3%). Of those who use the VersaCut™, 27% prefer the Piranha; while of those who use the Wolf, zero prefer the VersaCut™ (Figure 1). Qualities that impacted the preferences of one morcellator over another, in order of most to least importance were: the preferred device is safer, faster, easier to use, reusable, and less expensive (Figure 2). There were no differences in responses amongst groups aside from the selection of a faster device by more experienced surgeons ( $p<0.02$ ).

## Comment

In a cost analysis between the two currently available morcellators we found the Piranha morcellator to be more efficient, reducing OR morcellation times and cost, even when controlling for the expense of a disposable instrument.

Enucleated tissue weight, patient age and use of 5 alpha reductase inhibitors were similar between the two groups. Our findings differ from previous report of similar morcellation times between the two devices, which may be a reflection of the improved familiarity and ability to troubleshoot the Wolf Piranha system that comes with continued use.<sup>7</sup> We note that while the VersaCut morcellator blades were calculated assuming 3 uses as was noted by El Tayeb and colleagues, it is feasible to decrease the expenses by using morcellation blades greater than three times. However, as the blades are reused for large prostates, as in this series, they dull. This dulling effect decreases morcellation efficiency and would likely increase operative time.

We also noted that in a survey of endourologists, of those that responded, less than half perform transurethral prostate enucleation. The preferred morcellator for the highest volume surgeons was divided equally between the Lumenis and Wolf morcellators. Furthermore, morcellator safety was the highest concern, while cost was the least concern to the surgeon. While the response rate was low, this was a similar rate to a recent survey based study by Becker et al, investigating oral anticoagulation and transurethral treatment of benign prostatic



obstruction.<sup>10</sup> To our knowledge this is the first survey investigation into morcellator preference in the endourology community.

Much of the literature surrounding HoLEP and efficiency is focused on the enucleation portion of the procedure as it is the more technically challenging aspect and can be influenced by surgical skill. Dusing et al found that enucleation efficiency continues to improve over time with surgeon experience increasing to over 1gm/min of tissue enucleation.<sup>6</sup> Morcellation remains an equally important aspect of the surgery; however, there is little skill associated with morcellation and the procedure is highly equipment dependent. There is potential to significantly improve overall OR efficiency if an effective morcellation device is employed.

In a recent randomized clinical trial comparing the two devices El Tayeb et al noted that the Piranha morcellator achieved a slightly higher rate of morcellation 5.6 vs 4.8, this was not significant when compared to the VersaCut™ (p=0.14).<sup>7</sup> The efficiency of morcellation does differ significantly with our current investigation as we noted a 7 gm/min morcellation efficiency with the Piranha compared to 4.4gm/min with the VersaCut. Our excellent morcellation efficiency noted with the Piranha most likely reflects an improved understanding of the equipment and ability to troubleshooting the device as the number of cases with the Piranha has increased at our institution. For example, we note that decreasing the oscillation rate of the Piranha to 1000/min greatly reduces difficulties morcellating dense round “beach ball” tissue. In the investigation by El Tayeb et al, the authors noted a significant cost benefit with the VersaCut™

device (\$241 versus \$471,  $p < 0.001$ ). It should be noted that the El Tayeb investigation did not calculate OR time into total cost, only that of disposable instruments, which favors the VersaCut™ due to reusable blades. When including OR time into the analysis we identified a savings of nearly \$300 per case.

In another study comparing reusable blades between the two morcellator devices, Elshal et al noted a similarly increased morcellation efficiency with the Piranha morcellator at a rate of 6.2 gm/min compared with 2.1 gm/min with the VersaCut™ ( $p = 0.00$ ).<sup>9</sup> Laser scoring of the adenoma and use of a crown loop for extraction of non-morcellated tissue was likewise higher with the VersaCut™ group. Notably, 9% of the cohort had a bladder mucosal injury with the VersaCut™ morcellator ( $p = 0.01$ ). While we noted only a single clinically insignificant mucosal injury with the VersaCut and a much higher rate of morcellation with the VersaCut™ compared to Elshal's study, our findings favoring the Piranha are similar.

Our investigation is not without limitations, which include the retrospective nature of this study increasing recall bias. However, all data was originally collected in a prospective manner using a maintained database. While OR room costs were calculated on a per minute basis and reusable morcellation blades calculated based on a maximum of 3 uses per blade, it is possible to increase the number of blade uses but likely at the cost of efficiency and thus, an increase in OR time. It is also possible to accumulate more costs for the procedure if multiple blades are

utilized during a longer procedure regardless of morcellating system, but again this was not measured. We also note the participation of residents and fellows in all aspects of the cases, thus creating a heterogenous group with differing levels of morcellation experience in both cohorts. Finally, our survey response rate was low which can create a response bias regarding the preference of morcellator.

## Conclusion

In a matched cohort comparing morcellation cost utilizing both the VersaCut™ and Piranha morcellation devices, we identified a significant increase in morcellation efficiency. The increase in morcellation efficiency resulted in shorter OR times and an overall cost savings utilizing the Piranha morcellator. The cost savings persisted even when controlling for disposable expenses associated with the Piranha device. Of the endourologists that responded to the survey less than half perform transurethral enucleation. Of those, the majority are using their preferred device. Morcellator preference is largely based on safety, efficiency, and ease of use, while cost and reusability were of lesser importance

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Figure 1. Current morcellator use versus preferred morcellator

Figure 2. Rationale for Morcellator Preference stratified by surgeon volume

Supplementary Figures

Figure 1. Lumenis VersaCut

Figure 2. Richard Wolf Piranha

Figure 3. Morcellation with Richard Wolf Piranha

Accepted Manuscript

Table 1. Pre-operative demographics

	2013 (n=142)	2015-2016 (n=142)	p-value
Mean Age (Years)	69.8	69.7	0.92
Mean Pre-op PSA (ng/ml) SD	9.0 (9.9)	7.1 (7.0)	0.09
Pre-op Cr	1.2 (0.5)	1.1 (0.4)	0.63
Trus Volume, mls (SD)	104.4 (50.1)	107.2 (66.9)	0.71
Use of 5-ARIs (%) ARI-Alpha Reductase Inhibitor	40.1	44.7	0.47

Table 2. Intra-operative findings and costs

	2013 (n=142)	Recent (n=142)	p-value
Morcellation Time, min (SD)	20.1 (18.6)	14.0 (16.8)	<b>0.005</b>
Specimen Weight, gm (SD)	72.8 (48.6)	77.7 (57.6)	0.46
Morcellation Efficiency, gm/min (SD)	4.4 (2.4)	7.0 (3.0)	<b>&lt;0.0001</b>
Mean Morcellation Cost, USD (SD)	1420.80 (1313.52)	992.21 (1185.12)	<b>0.005</b>
Mean Morcellation costs including disposables, USD (SD)	1637.50 (1313.52)	1338.81 (1185.12)	<b>0.048</b>

Figure 1.

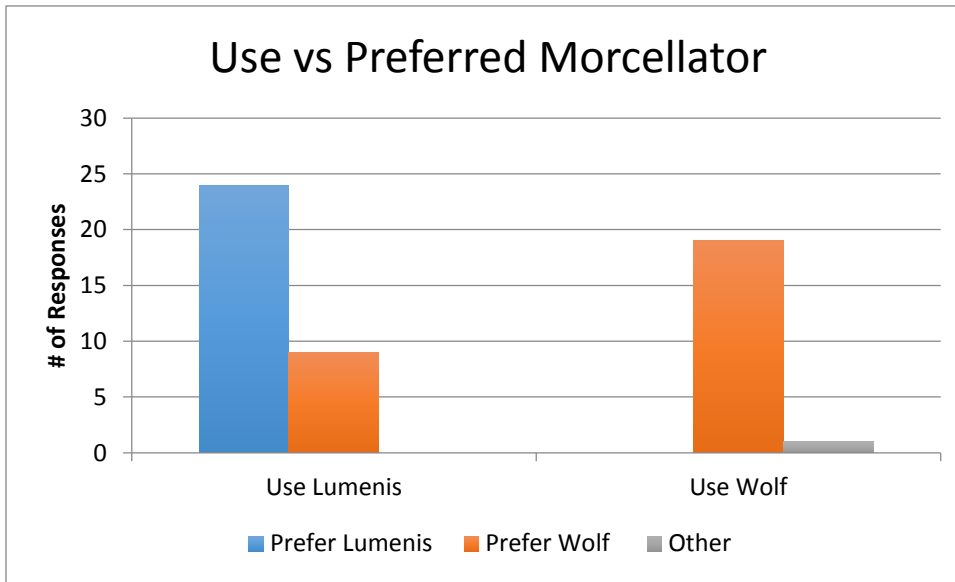


Figure 2.

