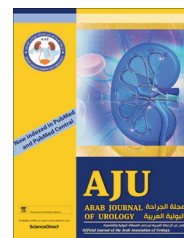




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PROSTATIC DISORDERS
ORIGINAL ARTICLE

Prostate tissue retrieval after holmium laser enucleation of the prostate; assessment of non-morcellation approaches



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KEYWORDS

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ABBREVIATIONS

Q_{max} , maximum urinary flow rate;
HoLEP, holmium laser enucleation of the prostate;
PVR, post-void residual urine volume;
TUR, transurethral resection

Abstract Objectives: To review non-morcellation approaches for tissue retrieval after holmium laser enucleation of the prostate (HoLEP) and whether these approaches demolish the advantages of the HoLEP procedure.

Patients and methods: We reviewed our prospectively maintained laser prostate database for HoLEP procedures where non-morcellation approaches were used for retrieval of the enucleated adenoma. Non-morcellation approaches were adopted in cases of morcellator malfunction or whenever concomitant pathology indicated laparotomy. Patients were stratified into the laparotomy group (Group I) or the transurethral resection (TUR) group (Group II). Safety and efficacy of each approach were assessed and compared.

Results: Between August 2012 and July 2015, of 392 HoLEP procedures non-morcellation approaches were used for tissue retrieval in 37 (9.4%). In 19 procedures a laparotomy approach was adopted (17 mini-laparotomies and two conventional laparotomies for concomitant diverticulectomy). TUR of the enucleated adenoma was adopted in 18 patients. Baseline demographic data and indications for surgery were comparable between the groups. However, significantly larger prostates were treated in Group I. There were no significant differences between the groups for tissue retrieval time, histopathological findings of retrieved tissue, and peri-procedure biochemical changes. However, significantly more tissue was retrieved (median tissue

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weight 115 vs 38 g) and at a faster rate (4.6 vs 1.09 g/min) in Group I. The median hospital stay was similar in both groups, but the median time to catheter removal was longer in Group I (5 vs 2 days). Minimal and similar peri-procedure complications were reported in both groups and in both groups there was a significant and comparable improvement in all urinary outcome measures.

Conclusion: In the absence or malfunction of a tissue morcellator, or whenever concomitant pathology indicates laparotomy, non-morcellation tissue retrieval approaches are feasible options for endourologists practicing transurethral enucleation of prostate adenoma. These approaches are valid alternatives retaining most of the advantages of the transurethral prostate enucleation procedure.

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Introduction

For over two decades transurethral enucleation of prostate adenoma using a holmium laser (HoLEP) has been extensively studied. HoLEP was promoted as a size independent procedure [1], being a cost-effective alternative to open prostatectomy [2] with the advantages of being safe in patients with bleeding disorders, reducing hospital stay and catheter time, and minimising the need for blood transfusion. The procedure has stood the test of time well [3]. Furthermore, the feasibility of HoLEP with concomitant urological procedures has been proven [4]. However, the acknowledged limitation of this procedure remains the tissue retrieval approach after transurethral enucleation [5].

Today, transurethral morcellation of the intravesical prostate adenoma is the standard tissue retrieval approach; however, transurethral morcellation of a completely enucleated intravesical adenoma is time consuming and tedious, and is associated with extra costs for the morcellator machine and its re-usables [5]. Occasionally, impaired visibility through the indirect nephroscope after enucleation may force the surgeon to stage the procedure resulting in another session of morcellation [6].

Non-morcellation approaches entail *in situ* resection of partially enucleated adenomas [7] and open cystostomy for extraction of intravesical adenomas [8].

The objective of the present study was to review our experience of non-morcellation approaches used for tissue retrieval after HoLEP and to assess whether these approaches compromise the acknowledged advantages of the HoLEP procedure.

Patients and methods

After obtaining Institutional Review Board approval, we reviewed our prospectively maintained laser prostate database for HoLEP procedures that were completed using a non-morcellation tissue retrieval approach. One surgeon (A.M.E.), who had passed the learning curve for HoLEP, performed or supervised all procedures.

Patients were admitted for BPH surgery whenever they had refractory LUTS with failed medical treatment, an indwelling catheter due to urinary retention, and failed trial of voiding without catheter, or refractory haematuria of prostatic origin.

Intervention

A 100 W holmium:yttrium-aluminium-garnet (YAG) laser (Versapulse, Lumenis Inc., Santa Clara, CA, USA) with a 550- μ m end-firing flexible fibre (SlimLine™ 550, Lumenis Inc.) was used. A continuous flow 26-F resectoscope (Karl Storz, Tuebingen, Germany) was used for all procedures.

The enucleation phase of HoLEP was performed as previously described [9]. After prostate enucleation, adenoma retrieval was routinely performed using a tissue morcellator [2]; however, in the absence of morcellator cutting blades or morcellator device malfunction, non-morcellation approaches were used. Moreover, if there was concomitant urological pathology this might also be an indication to change our surgical plan regarding the tissue retrieval approach.

Retrieval of the prostate adenoma was performed as follows:

Laparotomy approach (Group I)

For adenomas that were judged significantly large by the surgeon and/or in the presence of concomitant pathology (large bladder stones/bladder diverticulum) the enucleated adenomas were completely detached to the bladder followed by meticulous haemostasis. Then, a 22-F three-way catheter was inserted and continuous bladder irrigation was instituted. Clamping of the catheter outflow was done just before cystostomy and bladder irrigation was reinstated immediately after bladder closure.

- *Mini-laparotomy approach*, unless bladder diverticulectomy was indicated; in the same lithotomy position, a transverse 3-cm lower abdominal incision deep to the anterior rectus sheath was made and the two recti separated, followed by a transverse incision in the anterior bladder wall with stay

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