

# Transurethral Drainage of Prostatic Abscess Using 120 W Holmium Laser Technology



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## Abstract

**Introduction:** Prostatic abscess is an infrequent but serious pathology that could be treated by ultrasound-guided puncture, transurethral resection, or open surgery.

**Case Report:** We present a case of a 72-year-old male with a 3x5 cm prostatic abscess in the right lobe showed in abdominal computed tomography (CT). In the blood test, he presented coagulopathy. Urgent transurethral drainage by holmium laser was decided to be performed. It started with incision and opening of the right prostatic lobe with an energy of 1.2 J and a frequency of 20 Hz with a total power of 24 W. A 550-micron fiber was used for this technique. Coagulation of the area was performed with a power of 20 W. The postoperative course was uneventful.

**Conclusion:** The holmium laser appears to be an effective alternative in the treatment of this pathology in patients with coagulation disorders by providing adequate hemostatic control.

**Keywords:** Prostatic abscess, Holmium laser, Urinary infections

## Introduction

Prostatic abscess as a complication of urinary tract infection is a rare but potentially serious pathology in the context of bacterial prostatitis.<sup>1</sup> In terms of etiology, the microorganism found most frequently to be the cause is *Escherichia coli* in 60%-80% of cases.<sup>2</sup> Other important pathogens are *Pseudomonas* species, *Staphylococcus* and occasionally anaerobic bacteria.<sup>3</sup> The prevalence of prostatic abscesses caused by *Klebsiella pneumoniae* varies across geographic areas. *K. pneumoniae* is the main cause in southern Taiwan<sup>3</sup> and the second most frequent cause after *E. coli* in South Korea.<sup>4</sup>

Due to the high mortality rate, which ranges from 3%-16%,<sup>3</sup> early treatment is necessary. This should include parenteral or oral administration of antibiotics that are sometimes associated with surgical drainage of the abscess to reduce severe complications.<sup>5</sup>

We present the case of a 72-year-old male who presented a prostatic abscess secondary to *K. pneumoniae* with concomitant meningitis caused by the same microorganism, with the patient requiring urgent surgical drainage.

## Case Report

The patient was a 72-year-old man with a history of dilated cardiomyopathy of uncertain origin with a ventricular ejection fraction of 25%. The patient had a history of urological treatment and a permanent urinary catheter for acute urinary retention episodes, with a prostate volume

of 167 g. He came to the emergency department suffering from asthenia, malaise, dyspnea and fever of up to 40°C. His heart rate was 115 beats per minute. The analysis showed elevated acute phase reactants with a C-reactive protein of 20.37mg/dL (0-0.5 mg/dL), procalcitonin of 1.08 ng/mL (0-0.5 ng/mL), 21.4 × 10<sup>9</sup>/L leukocytes (4-10 × 10<sup>9</sup>/L) with 93% neutrophilia, hemoglobin of 12.3g/dL (14-17 g/dL), and 160 10<sup>9</sup>/L platelets (140-45109/L). Prothrombin time was 17 seconds (9.40-12.50 seconds) and Quick coagulation test was 65% (70%-100%). The patient was admitted to internal medicine with a diagnosis of sepsis probably due to an infection of the urinary tract. Empirical treatment was started with intravenous Meropenem. During his hospitalization, he presented clinical worsening with nuchal rigidity and a decreased level of consciousness. A whole body computed tomography (CT) scan was requested. The cranial CT revealed the presence of leptomeningeal enhancement, compatible with meningitis. In addition, pelvic CT showed a liquid collection of 3x5 cm, probably abscessed in the right prostatic lobe (Figure 1).

A lumbar puncture was performed and the cerebrospinal fluid (CSF) obtained showed unclear characteristics and biochemistry compatible with meningitis of bacterial etiology. The culture of CSF was positive for multisensitive *K. pneumoniae* as well as the blood cultures. In view of the poor clinical evolution, the patient was admitted to the intensive care unit (ICU). Therefore, as he was a hemodynamically unstable patient in the context of



Figure 1. Right lobe prostatic abscess.

bacterial meningitis and prostatic abscess, the decision was taken to perform an urgent surgical intervention by drainage of the prostatic collection.

A cystoscopy was carried out, revealing an enlarged prostate, especially affecting the right prostatic lobe, which concurred with the preoperative CT scan. The decision was decided to carry out transurethral drainage by means of a 120 W holmium laser with MOSES technology, using 550 micron fiber. The incision was started at the 7 o'clock position of the cystoscopic schedule at the level of the bladder neck and ended at the level of the verumontanum, with an energy of 1.2 J, a frequency of 20 Hz and a total power of 24 W (Figure 2). The incision was deepened to the opening of the abscess cavity for drainage (Figure 3). A sample was taken for culture, and during the procedure, all the purulent material was eliminated by continuous irrigation with saline solution, and the cavity was completely cleaned. Hemostasis was precision-controlled, with the laser device set at 50 Hz-1 J (20 W). A 22 French three-way urinary catheter was inserted. The culture of the purulent material was positive for a multi-sensitive strain of *K. pneumoniae*. The postoperative course was uneventful. After the operation, the patient showed clinical and analytical improvement and was discharged from the ICU two days after the intervention and from the hospital ward after 20 days.

### Discussion

Prostatic abscesses are a rare clinical entity that represents 0.5% to 2% of all prostatic diseases and they are potentially serious, with a mortality rate of 6%-30%.<sup>6</sup> Their etiopathogenesis is due to retrograde flow of contaminated urine, as well as the presence of prostatitis of torpid evolution or through hematogenous dissemination of another infectious focus.<sup>7</sup> The most important predisposing factors are diabetes mellitus,



Figure 2. Holmium laser incision and purulent material drainage.

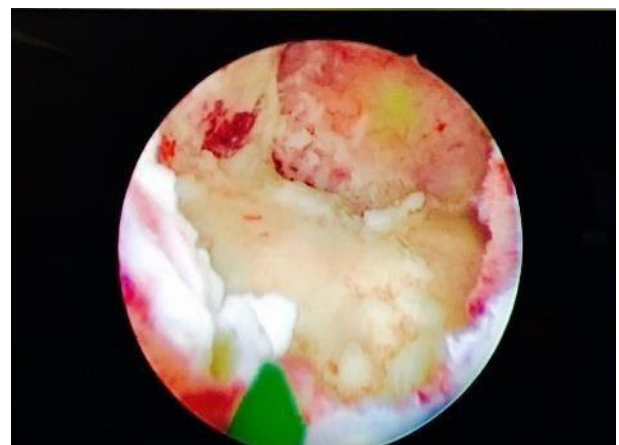


Figure 3. Abscess cavity opened.

infravesical obstruction, surgical instrumentation, immunosuppression, alcoholism, neurogenic bladder and advanced age. The growth in cultures of *K. pneumoniae* from purulent material of prostatic origin and the CSF suggests this as a possible origin of the prostatic infectious focus with subsequent infectious seeding through hematogenous route to the central nervous system.

In some cases, isolated antibiotic therapy can be effective for the resolution of the abscess, but in other cases, the evolution is torpid and can lead to an extremely critical situation if surgical drainage is not performed promptly.<sup>8</sup>

Minimally invasive drainage procedures include transrectal or perineal ultrasound-guided aspiration puncture with pig-tail placement and transurethral resection using monopolar or bipolar energy. However, though these techniques may be adequate in a patient with a single large abscess, they are not sufficient in multifocal abscess cavities.<sup>9</sup>

Holmium laser technology, which is currently used for the HoLEP technique (holmium laser enucleation of the prostate) in benign prostatic hyperplasia, as well as for the various endoscopic treatments of urolithiasis, can be useful in this type of drainage. By enabling controlled incisions of the prostatic tissue and working with saline solution to avoid the risk of transurethral resection

syndrome, it allows better hemostasis for anticoagulated patients and patients with coagulopathy.<sup>4</sup>

The laser technology offers several further advantages, such as the ability to perform a simultaneous HoLEP for the elimination of the residual adenoma. This ensures the complete resection of the infected glandular prostate tissue. In published studies, up to a third of patients with prostate abscesses eventually require endoscopic treatment of the prostate due to associated benign prostatic hyperplasia (BPH).<sup>10,11</sup>

This case describes a minimally invasive technique as an alternative treatment to prostate abscesses. The holmium laser enabled resolution of the prostatic abscess and the benign prostatic hyperplasia in the same surgical procedure. However, there is still a lack of prospective randomized trials to provide further scientific evidence for the assessment of its true efficacy.

### Conclusion

Prostatic abscesses require early diagnosis and treatment to avoid disseminated infections. The use of new technologies such as the holmium laser for the drainage of this pathology seems to be a valid option, providing an accurate and adequate hemostatic control in patients with coagulation disorders.

### Conflict of Interests

The authors have no conflicts of interest to declare.

### Ethical Considerations

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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