

LETTER TO EDITOR

TULA DUAL: Trans Urethral Laser Ablation of recurrent bladder tumors in outpatient setting

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To the Editor,

Bladder cancer (BCa) is the second most common cancer in urological clinical practice, after prostate adenocarcinoma. Usually occurs in patients between 60 and 70 years old, three times more frequently in men than women (1, 2). About 75% of bladder cancer are pTa or pT1 (3), even more frequently considering a population younger than 40 years old. Early detection is of paramount importance since allows to find tumors when they are still superficial and therefore with a better prognosis.

Management of *Non Muscle Invasive Bladder Cancer* (NMIBC) accordingly to EAU guidelines (4), is based on intravesical chemotherapy and endourological procedures (transurethral resection of bladder cancer), which requires operating theater, anesthesiologic assistance, scrub nurses and dedicated instruments (5, 6).

Trans Urethral Resection of the Bladder Tumor (TURBT) is the gold standard in the treatment of NMIBC accordingly to the literature and it is in fact a mature procedure with a standardized technique, but it is still facing some challenges and risks such as difficult control of cutting depth, stimulation of the obturator nerve, bladder perforation and iliac vascular injury (7).

For these reasons, it is interesting to study how other technologies are growing and how we could use them in this so frequent and ubiquitous disease management. In particular, recently there is a great interest in transurethral laser surgery and especially regarding its comparison to standard TURBT. Some studies showed similar results in both oncological and safeness terms (8-12). The en bloc laser techniques might allow a clearer cut of the tumor base, simplifying pathologist reading of the surgical samples (13).

Furthermore, BCa has a 1- and 5-year recurrence rates that can be very high, and several patients require additional TURBT during follow-up (4, 14). One of the recent problems of healthcare organizations is to address the current shortage of operating theater resources, reducing costs, while guaranteeing the best possible treatment for the patients. From this point of view, the possibility to treat some carefully selected BCa recurrences patients with on an outpatient basis would represent an important saving in both economic and organizational terms, reducing hospitalization and discomfort for the patient and his family.

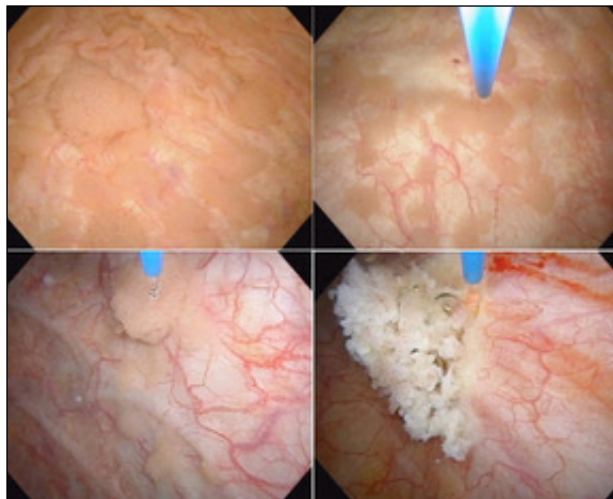
According to these pressing needs, we present our experience of an innovative outpatient laser treatment ("TULA DUAL") in a BCa relapsed patient.

We highlight the case of an 85 years-old woman in follow-up over the previous five years for NMIBC (urothelial bladder cancer, pTa LG). She was ineligible for standard TURBT because of age and several comorbidities which led to an ASA IV score. She was taking medical therapy for atrial fibrillation (anticoagulation therapy), hypertension and diabetes mellitus, added to recurring episodes of hematuria. During a follow up cystoscopy were endoscopically detected over 20 lesions highly suspected for BCa recurrence. The lesions were pink, papillary and typically aspect of non-muscle invasive lesions. The most of these lesions were millimetric, three of these had a plant base of about one centimeter. A recent urinary cytology was negative for high grade BCa while a Kidney-Ureters-Bladder Ultrasound didn't show hydronephrosis or further suspicious findings.

In this situation we should have organized an operating theater to perform a TURB, suspending the anticoagulation therapy; but instead, considering the anamnesis and the clinical condition, we decided accordingly to the patient to perform the TULA DUAL procedure.

The TULA DUAL is an endoscopic procedure, executed with a DUAL laser (diode laser technology 980-1470 wave length) in local anesthesia or even without it, in an ambulatory setting. It allows the contemporary vaporization and hemostasis of tissues. Patients are summoned in ambulatory, where is administered a one-shoot antibiotic prophylaxis according to current guidelines for endoscopic operative procedures such as TURBT (15).

Figure 1.
Intraoperative pictures showing office-based laser management of NMIBC.



In women such as this patient, we perform a bladder intravesical instillation with saline solution (50 mL) plus one lidocaine 2% vial for 15 minutes; in men we add also lidocaine-based gel left in the urethra. It is necessary to empty the bladder before the beginning of the procedure. The TULA is performed using a flexible cystoscopy with a 320 micron fiber and the dual laser (Figure 1).

The power of laser, and, the use of a single wave length or a mixed wave length, is based on volume of lesion/s. We usually use the single wavelength of 1470 nm set at 3 watts of power for small lesions while, for bigger lesions, we prefer to mix the wavelength of 980nm set at 5 watts of power plus the wavelength 1470nm set at 3 watts of power.

The above described patient underwent a 20 minutes procedure in the endoscopy room, no operative theatre, no general or spinal anesthesia, no bladder catheter after procedure or preoperative exams. She didn't complain any pain or discomfort during the procedure and neither intraoperative nor postoperative complications occurred. The patient only reported a minimal hematuria which disappeared in the first postoperative day. No disease recurrences were detected at the 3-months cystoscopic follow-up.

The TULA DUAL is a brand-new procedure that might be indicated during follow-up of NMIBC selected patients, or for radiotherapy-related cystitis. The category of patients who could benefit the most by this outpatient laser alternative to TURBT are those who are not fit for conventional treatments under anesthesia because of multiple comorbidities or anti-coagulant/antiaggregant drugs assumption. Considering the high frequency of bladder cancer, having the possibility of following up patients, managing them, even the ones who are not eligible for endoscopic surgery, and simultaneously lowering costs is surely a great deal that this treatment offers.

Because of the non-necessity of operating room this technique is even more interesting, especially after COVID pandemic that still cost everybody a great demand of theatres and delays (16).

Bladder cancer has been estimated as the most expensive cancer to health care systems. The average expense for patient is currently more than \$100.000 and more than 70% of this is due to the cost of repeated TURBTs (17-18). These prices could be dramatically reduced if patients were managed in the office setting. In fact, office-based laser vaporization might allow to save more than 50% of the estimated cost. The fundamental factor to determine the suitability of office-based management of NMIBC is the correct identification of eligible patients that should be those at lower risk of progression and at higher risk of intra- and post-operative complications if undergone TURBT.

Some authors already evaluated office-based procedures for the management of NMIBC with retrospective data (19). Donat *et al.* (20) described successful management of NMIBC with no recurrence within 6 months. All tumors were smaller than 0.5 cm, with a negative urine cytology. The risk of progression in this group was approximately 8%. Recently, Pedersen *et al.* (21) evaluated in a prospective study the office-based photocoagulation of bladder tumor. They found the first procedure to be non-inferior to TURBT in terms of progression rate and complications. The 98% of patients declared to prefer the photocoagulation.

Studies are needed in order to determine results of office-based procedures and in particular of TULA DUAL, both in terms of relapse and progression compared to TURBT.

Elderly patients such as our, with multiple morbidities are often not fit for conventional treatment under general anesthesia. TULA DUAL offers a technique using flexible cystoscopy for the treatment of bladder tumor under local or even no anesthesia in outpatient settings.

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