

## Transurethral PLASMA En Bloc Resection of NMIBC

Bladder Endo Dissection (BED)



# Transurethral PLASMA En Bloc Resection of NMIBC

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## Disclaimer

**This surgical technique is presented to demonstrate the PLASMA en bloc resection technique utilized by Prof. Bernard Malavaud, Professor of Urology at Toulouse Medical School and Head of Uro-Oncology at the Institut Universitaire du Cancer in Toulouse (France).**

This procedure guide is a voluntary service of Olympus, compiled with the greatest possible care. The guide is not meant to replace the instructions for use. All users of this product must at all times observe all mandatory information for the product, found, in particular, on the labels and the instructions for use. This guide merely contains guideline values which must be verified by the healthcare professional for their applicability in the individual case and does not represent medical advice or recommendations. Depending on the individual circumstances, it may be necessary to deviate from the generic information provided in this guide.



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Uro-Oncology Unit



# The Procedure

## What is PLASMA En Bloc Resection?

**PLASMA en bloc resection of bladder tumor can be described as the removal of the bladder tumor in one piece.**

It represents a safer alternative to traditional NMIBC resection, and should be considered for treating NMIBC. The procedure demonstrates benefits in a recent meta-analysis on the treatment of NMIBC.<sup>1</sup> Following 2020 European Association of Urology (EAU) guidelines the principal objective of the procedure is to ensure adequacy of resection, that is complete resection with detrusor muscle in the specimen.<sup>2</sup>

### **Benefits of PLASMA En Bloc Resection**

- **Optimal specimen** for expert histological evaluation.<sup>1</sup>
- **Precise and controlled** procedure, thereby improving the safety profile with reduced bleeding, reduced time of catheterization and fewer complications.<sup>3</sup>
- **Fully compliant** with EAU guidelines.<sup>2</sup>

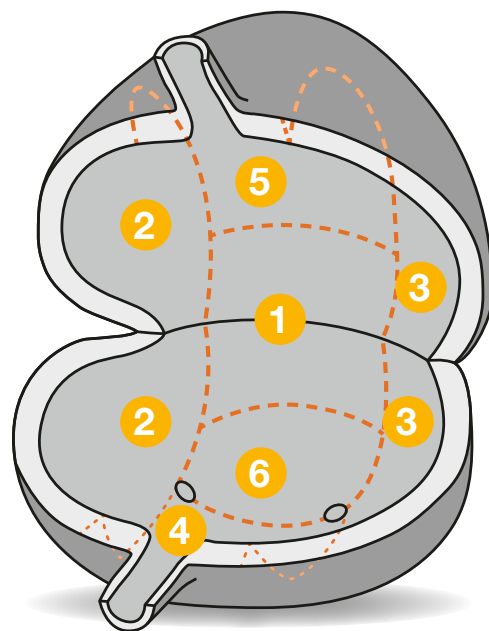


# Anatomy Landscape

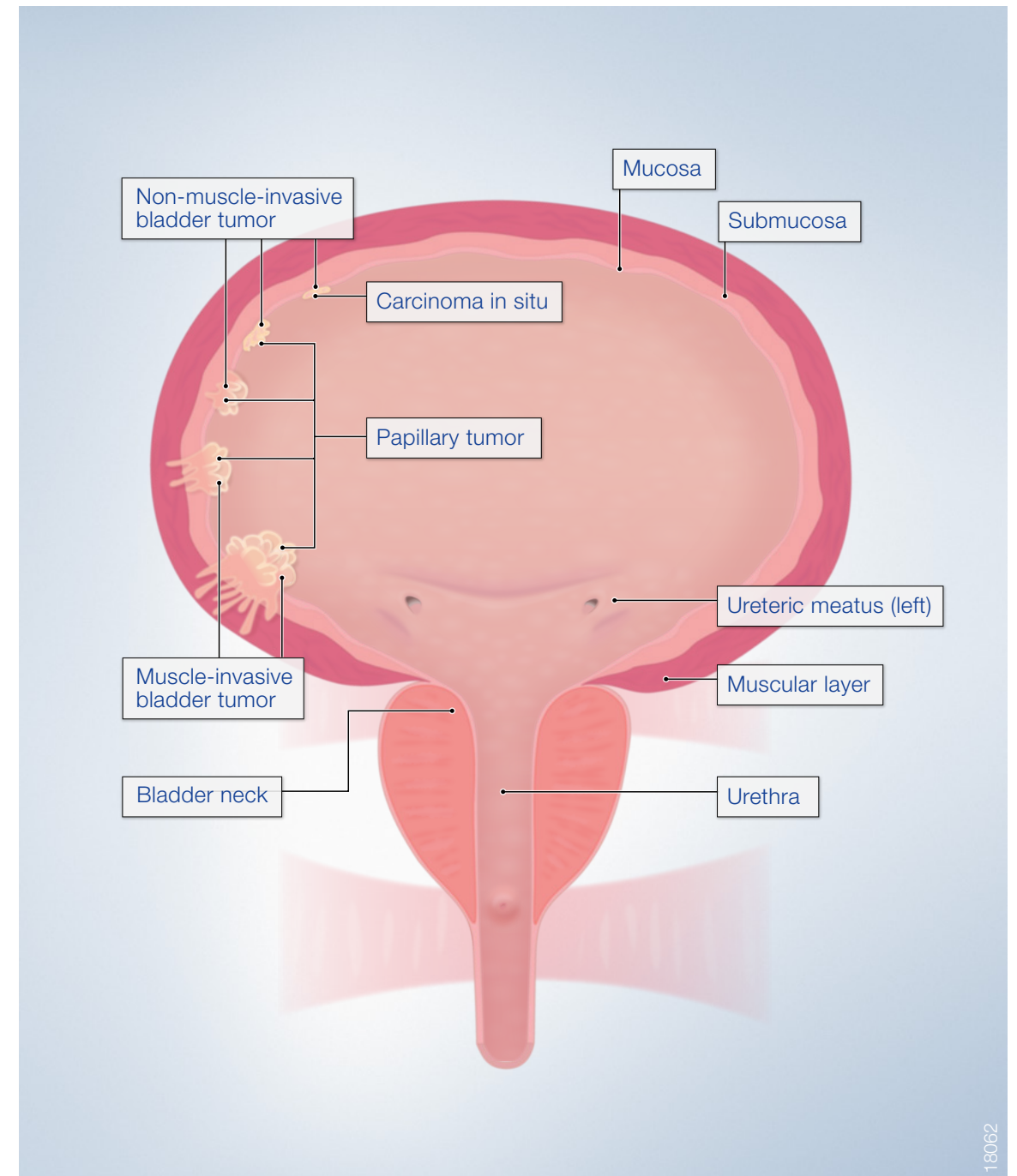
## PLASMA En Bloc Resection

**For the purposes of this procedure, we refer to the main structures of the bladder as given below.**

The mucosal layer encompasses the mucosa and submucosa. The EAU guideline recommends documenting all endoscopies with the use of a bladder diagram that separates the bladder into six areas:<sup>2</sup> dome, right lateral wall, left lateral wall, trigone, anterior wall and posterior wall. In the following the procedure steps refer to this diagram.



- 1 Dome
- 2 Right lateral wall
- 3 Left lateral wall
- 4 Trigone
- 5 Anterior wall
- 6 Posterior wall

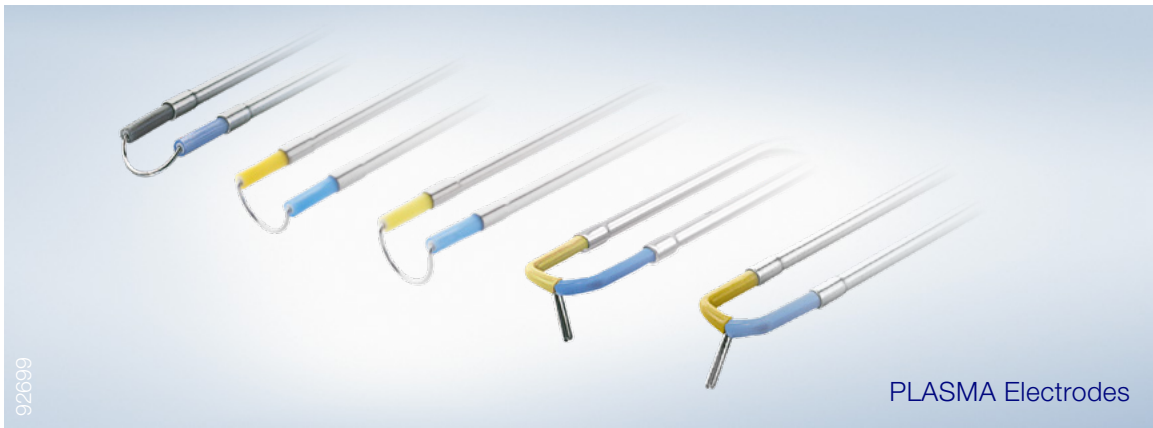




# Recommended Equipment

## PLASMA En Bloc Resection

The following inventory lists the equipment that can be used to perform a PLASMA en bloc resection of NMIBC.

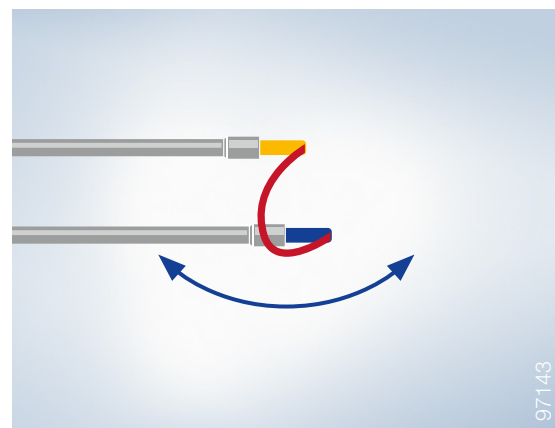


Long resectoscope also available.

# Technique of Using the Instruments

## General PLASMA Resection Principles for NMIBC Management

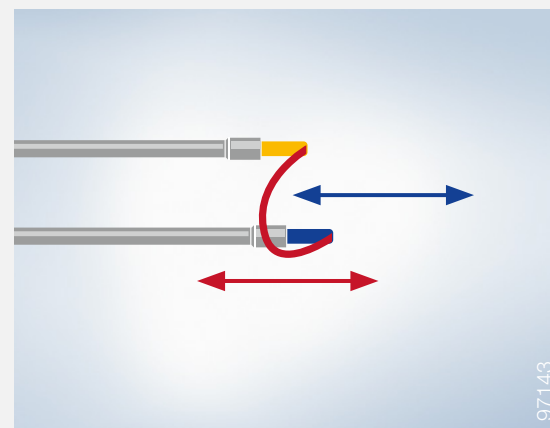
- Incise the bladder wall at the desired depth under direct vision control before developing the plane of dissection.
- Perform prograde dissection using both intermittent activation of cutting mode and blunt dissection.
- In contrast to standard resection take advantage of the three degrees of freedom of your loop.



### Standard Retrograde TURBT

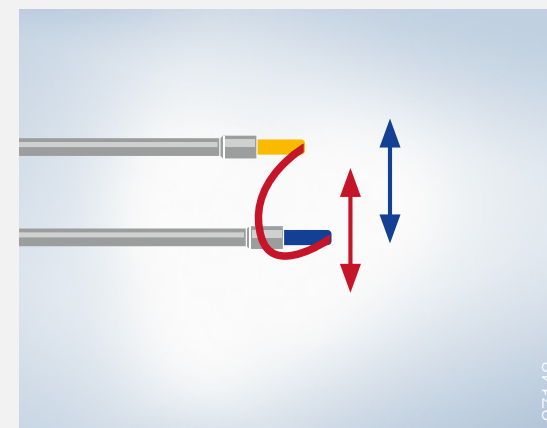
1.5° of freedom.

## Three Degrees of Freedom and Blunt Dissection



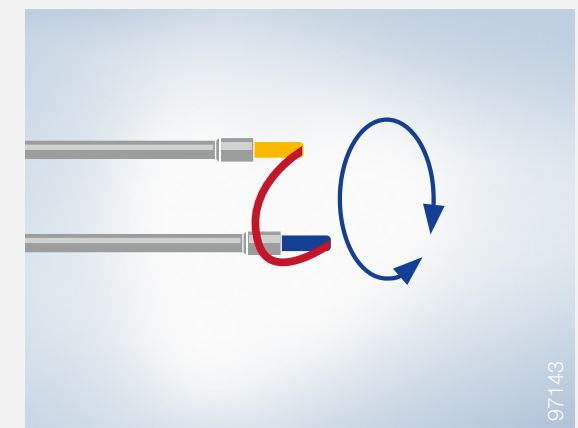
### Axial

Axial movement should be performed in a prograde direction to allow direct vision of the plane of dissection. It is especially helpful in the dissection of tumors located at the bladder neck, trigone and lateral aspects of the bladder.



### Transverse

Mainly used in conjunction with axial movement to develop the plane of dissection after incision.



### Coronal

Coronal movements are necessary for initiating the dissection of tumors of the bladder dome by a sharp circular incision.

blue arrow  : **sharp** dissection  
red arrow  : **blunt** dissection

# PLASMA En Bloc Resection of Bladder Tumor

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## Overview of Procedure Steps

### **1. Cystoscopy**

Inspection of the Bladder

### **2. Marking of Resection Borders**

### **3. Perform En Bloc Resection**

**3.1** Dome Lesion

**3.2** Lateral Wall Lesion

**3.3** Trigone, Anterior and  
Posterior Wall Lesion

### **4. Evacuation of the Tumor**

Inspection of the Bladder

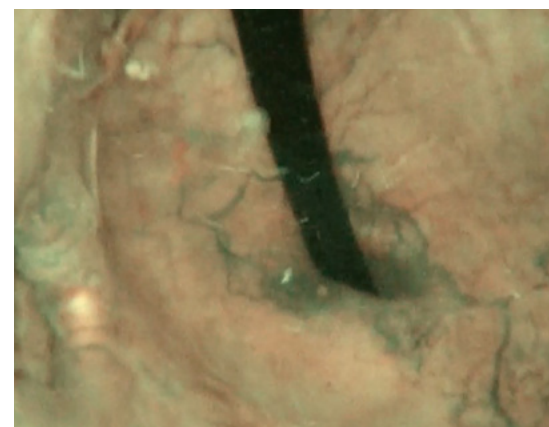
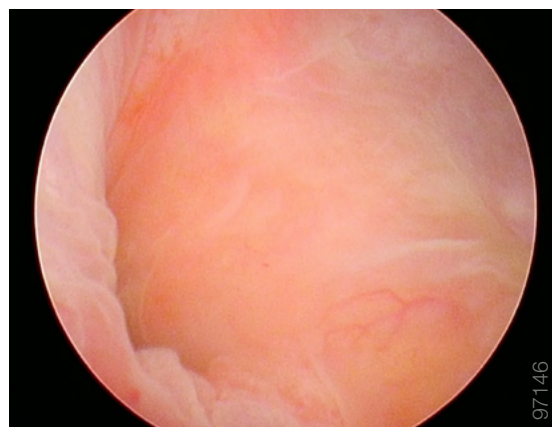
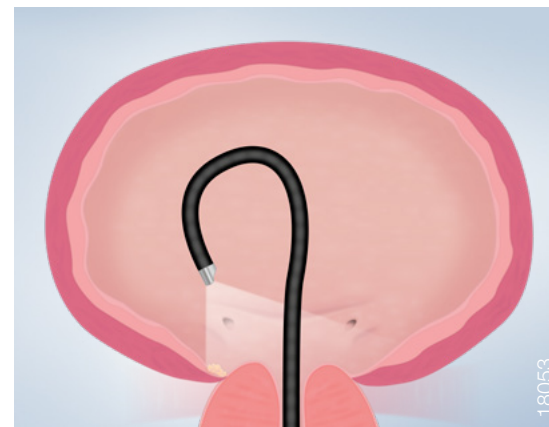
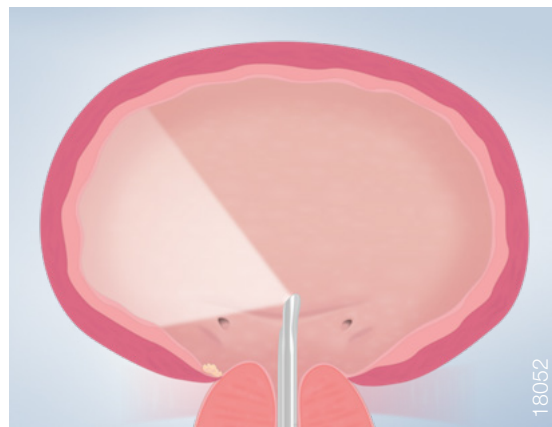
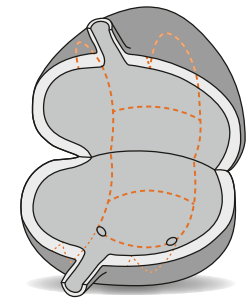


# 1. Flexible Cystoscopy | Inspection of the Bladder

## Transurethral PLASMA En Bloc Resection of NMIBC

### Description

Inspect all the bladder and report each lesion in a bladder diagram.



*Rigid cystoscopy*

*Flexible cystoscopy*

### Key Insights



- Thorough examination of the entire bladder lining is crucial to **identify all areas of suspicion and to select the best operative strategy** in view of the size, number and position of the tumors.
- Identification of suspicious areas is best achieved by taking advantage of the technological advances of modern digital HD flexible cystoscopes, such as **large field of view, high definition** and the ability to highlight suspicious features by **advanced imaging**.



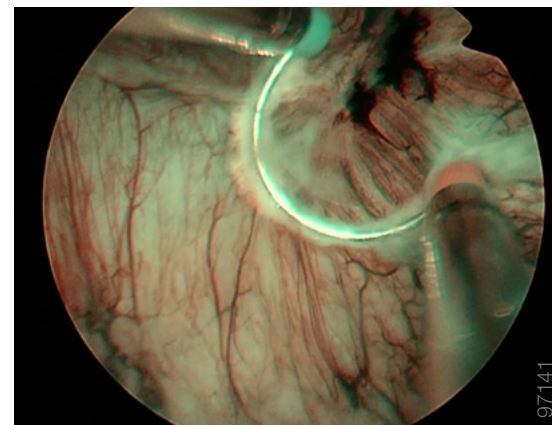
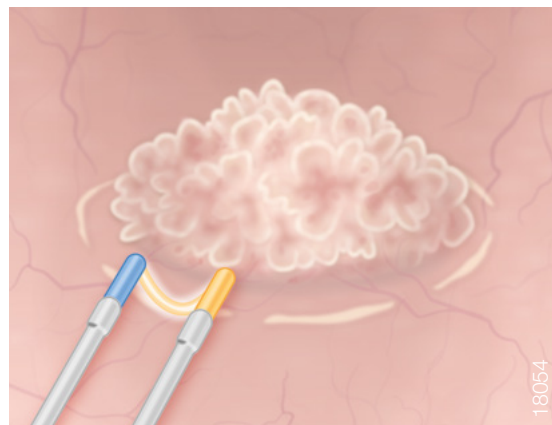
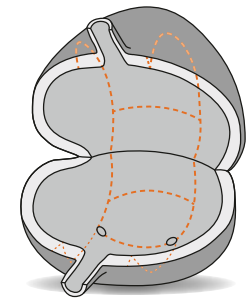


## 2. Marking of Resection Borders

### Transurethral PLASMA En Bloc Resection of NMIBC

#### Description

Use the coagulation mode to superficially mark the resection borders before any resection as your vision might later be degraded by edema or bleeding. Marking will ultimately serve to double-check the extent and quality of the dissection.



#### Key Insights



- Large vessels can be coagulated before initiating the dissection in order to **prevent bleeding**.

**Recommended Electrode:**  
PLASMA Loop Electrode.

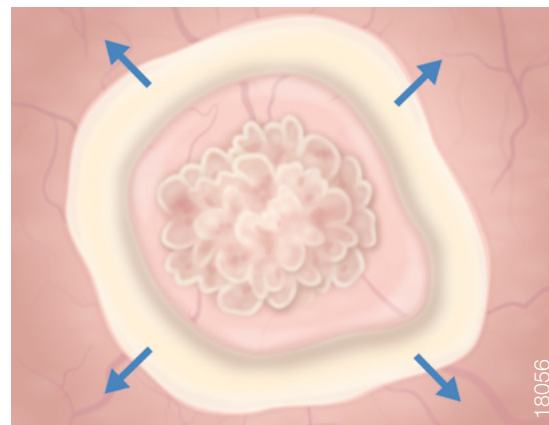
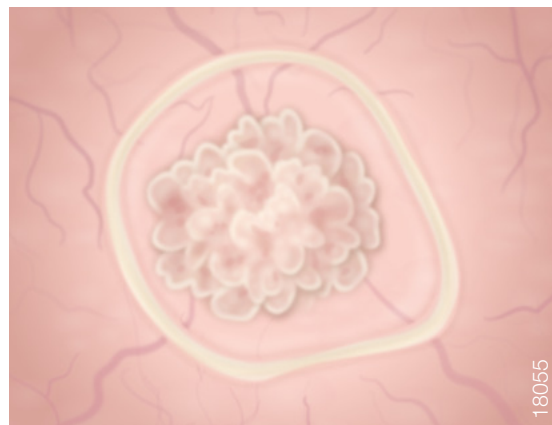
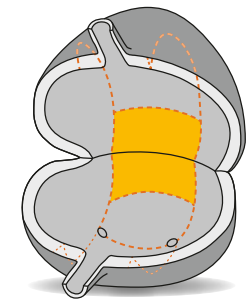


## 3.1 Perform En Bloc Resection | Dome Lesion

### Transurethral PLASMA En Bloc Resection of NMIBC

#### Description

- Circumscribe the lesion at low bladder pressure (40-50 mmHg) with a coronal movement using the loop electrode.
- Use the effect of hydro-dissection by filling the bladder. Then perform the final resection by sharp and blunt transverse dissection.



#### Key Insights



- To **reduce the risk of perforation**, avoid overdistension of the bladder.

#### Recommended Electrode:

45° angled PLASMA Loop or PLASMA Needle Electrode.



## 3.2 Perform En Bloc Resection | Lateral Wall Lesion

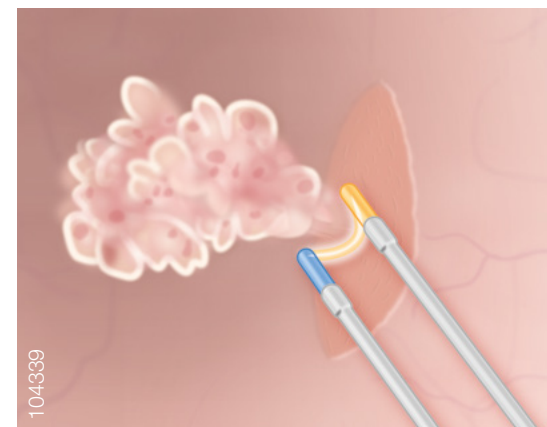
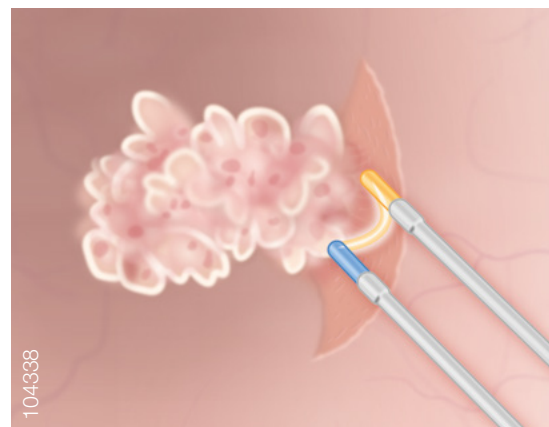
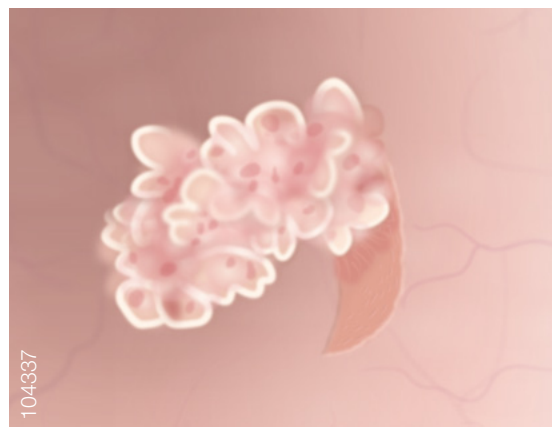
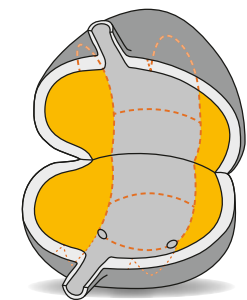
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### Transurethral PLASMA En Bloc Resection of NMIBC

#### Description



1. The dissection of lateral tumors begins at the point closer to the bladder neck. Under direct vision, the plane of dissection is selected and followed with axial movements of the loop. It is helpful to lift the tumor by inserting the beak of the outer sheath underneath.
2. Move the loop sideways in a lateral direction by a mix of axial and transverse movements. This will free the lateral insertion of the tumor, which will then fall down toward the media line.
3. Move medially to complete the dissection by axial and transverse movements. The final steps will be to sever the last lateral attachments before retrieving the specimen.







## 3.2 Perform En Bloc Resection | Lateral Wall Lesion

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### Transurethral PLASMA En Bloc Resection of NMIBC

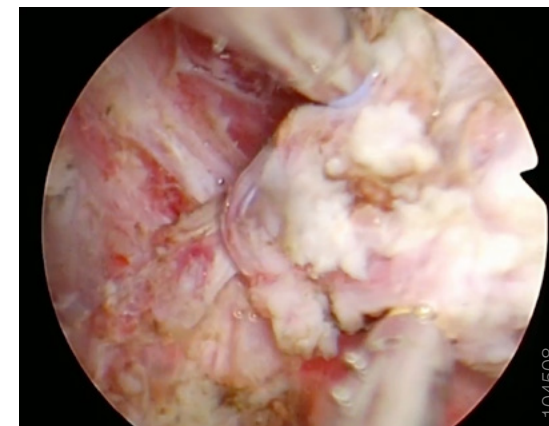
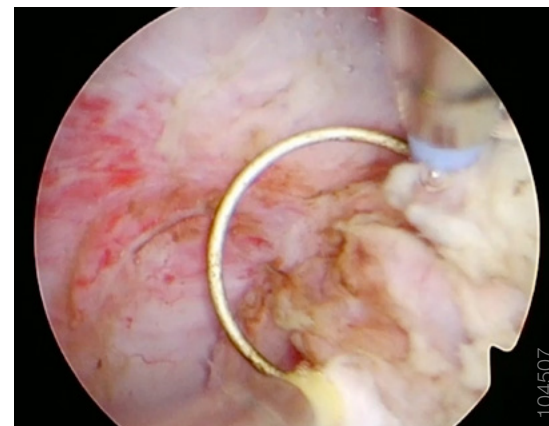
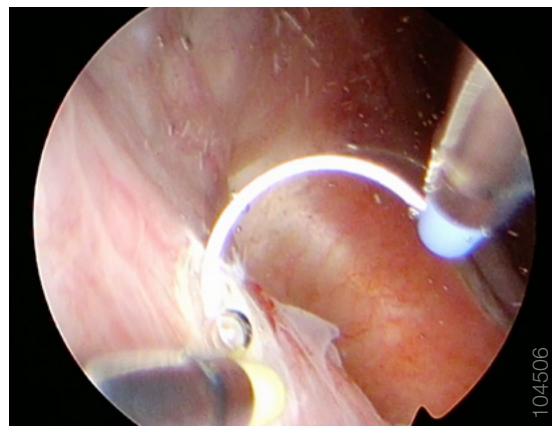


#### Key Insights

- There may be a risk of obturator nerve stimulation that can be **reduced by avoiding overdistension of the bladder and prevented by preoperative or perioperative obturator nerve block**. Even though the use of intermittent “burst resection” cannot wholly prevent the stimulation, it helps control the extent of leg contraction.
- To **reduce the risk of perforation**, it may be helpful to rotate the loop so that only one prong and half of the loop cutting edge are in contact with the bladder wall.

#### Recommended Electrode:

PLASMA Loop or PLASMA Needle Electrode.





## 3.3 Perform En Bloc Resection Trigone, Anterior and Posterior Wall Lesion

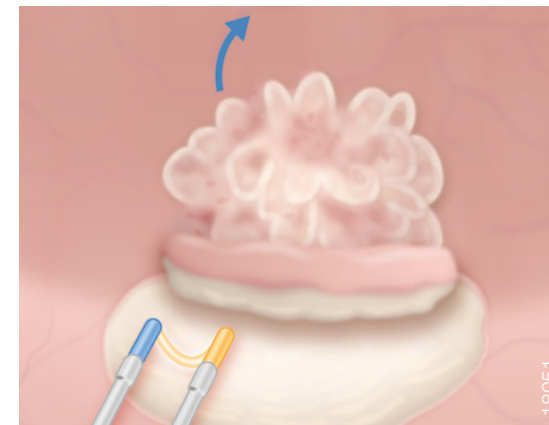
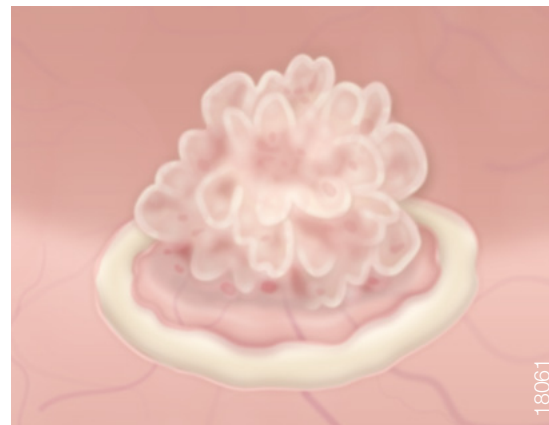
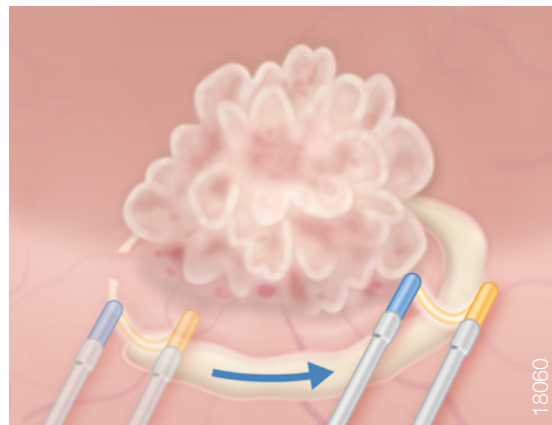
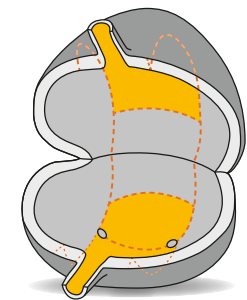
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### Transurethral PLASMA En Bloc Resection of NMIBC

#### Description



- For lesions smaller than 1.5 cm, you may first circumscribe the tumor by incising the bladder wall at the adequate depth.
- While this is readily performed for tumors located at the trigone and posterior wall, it is rarely feasible for lesions of the anterior wall, whose access by the resectoscope is hindered by the bladder neck. Using the 30° telescope there is a nice expedient to improve direct visualization of the lesion.
- Prograde dissection is then performed by successive axial movements of the loop.





## 3.3 Perform En Bloc Resection Trigone, Anterior and Posterior Wall Lesion

02

### Transurethral PLASMA En Bloc Resection of NMIBC



#### Key Insights

- It is often helpful for large tumors to **lift the lesion with the beak of the resectoscope** in order to highlight any smooth muscle fibers attached that can then be sectioned under direct vision. In the case of the anterior wall the lesion tends to fall down, which facilitates the dissection.
- By order of difficulty, **lesions located at the trigone are less challenging** than those at the posterior wall. **Those of the anterior wall can be even more challenging** in terms of access when they arise in a large bladder or when they are close to the bladder neck and in terms of safety, as the bladder wall is thin and distensible and can be perforated in the event of overdistension.

**Recommended Electrode:**  
PLASMA Loop or PLASMA Needle  
Electrode.





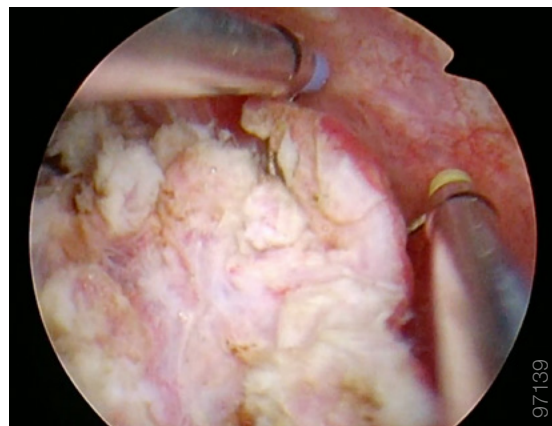
## 4. Evacuation of the Tumor

### Transurethral PLASMA En Bloc Resection of NMIBC



#### Description

- <2 cm specimens can easily be **grasped between the loop and the extremity of the inner sheath**, which is then disconnected to allow the safe extraction of the specimen within the outer sheath.
- Large specimens are sometimes amenable to the same manner of extraction. Alternatively, the **specimen can be fragmented** either by standard resection of the exophytic bulk of the tumor before completing the en bloc dissection of the tumor insertion onto the bladder wall or by fragmenting the en bloc specimen at the end of the dissection.



#### Key Insights

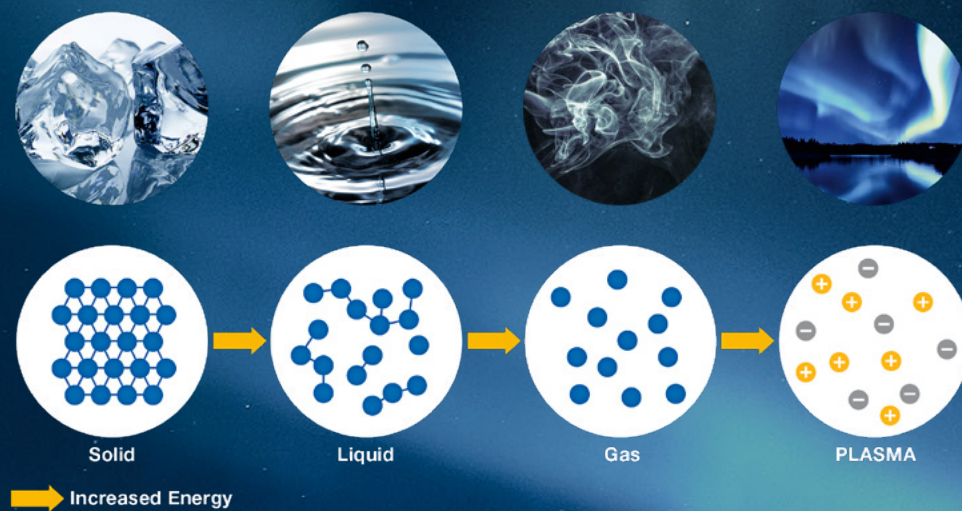
- At the end of the procedure, it is helpful to **leave a few strands of fiber between the tumor and the site of resection** in order to avoid the floating of the specimen and facilitate its retrieval.
- While it is a rare location for primary tumors, **many recurrences are observed at the anterior part of the bladder**. Floating tumor cells have been implicated in early recurrences. **Debris and microbubbles are often observed at the dome at the end of the procedure**; they can be easily removed by suction by overinflating the bladder, inserting the tip of the resectoscope close to the debris, and disconnecting the inner sheath.



# PLASMA+

## What Is PLASMA?

- PLASMA is one of the **four fundamental states of matter**.
- It is created when **energy is applied to a gas** that then turns into PLASMA.



- Due to its conductivity, PLASMA enables energy to cross at lower levels. This allows for **lower operating temperatures** and, therefore, **less thermal spread**. The targeted tissue is vaporized by a locally confined denaturation process, while **heating effects in the surrounding tissue are minor**.

### Discover Other Forms of PLASMA

PLASMA is common in our world and appears in different variations in nature. It is especially prevalent in atmospheric and outer space phenomena such as the sun and initiates polar lights as well.

# Transurethral PLASMA En Bloc Resection of NMIBC

## References

- <sup>1</sup> Yuen-Chun Teoh, J., MacLennan, S., Wai-Shun Chan, V. et al. *An International Collaborative Consensus Statement of En Bloc Resection of Bladder Tumor Incorporating Two Systematic Reviews, a Two-round Delphi Survey, and a Consensus Meeting*. European Urology 2020 Oct 1; 78(4):546-69.
- <sup>2</sup> Babjuk, M., Burger, M., Compérat, E. et al. *EAU Guidelines on Non-muscle-invasive Bladder Cancer*. European Association of Urology 2020: 14-15.
- <sup>3</sup> Sugihara, T., Yasunaga, H., Horiguchi, H. et al. *Comparison of perioperative outcomes including severe bladder injury between monopolar and bipolar transurethral resection of bladder tumors: a population based comparison*. J Urol. 2014 Nov;192(5): 1355-9.

As medical knowledge is constantly growing, technical modifications or changes of the product design, product specifications, accessories and service offerings may be required.

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