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PLASMA+

Transurethral Enucleation of the Prostate with PLASMA

Procedure Guide

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Transurethral Enucleation of the Prostate with PLASMA

Disclaimer

This surgical technique is presented to demonstrate the technique utilized by Prof. Raßler, MD, of the Urology Department at the St. Elisabeth Hospital in Leipzig (Germany).

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. Any user 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 HCP for their applicability in the single case and do 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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St. Elisabeth Hospital Leipzig

Urology Department

The Procedure

What Is PLASMA Enucleation?

PLASMA enucleation uses the natural anatomy by “peeling” prostate tissue out of the capsule.

Once the right layers have been located, each prostate lobe is peeled off in one piece. There are several ways to perform the technique: as a partial or complete enucleation. In the case of a partial (incomplete) enucleation, the removed lobes are still connected to the capsule through an adenoma bridge and then resected with a loop electrode.

Benefits

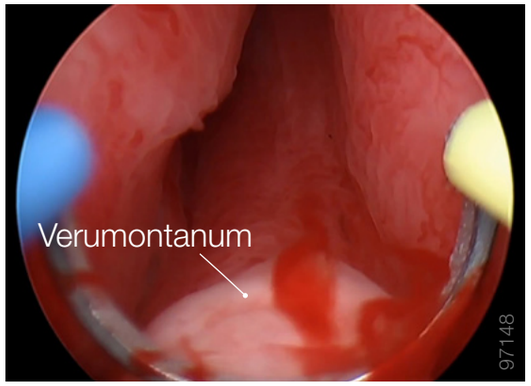
- Treatment of **any prostate gland size** with tissue preservation for pathologic examination.
- **Complete excision** of obstructing adenoma.
- Shorter **catheterization time** and **hospital stay** compared to resection and open prostatectomy.[1,2]

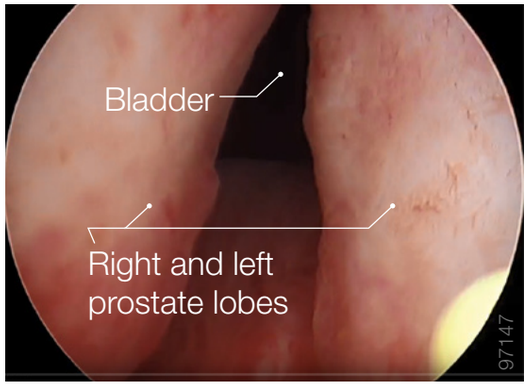
Anatomy Landscape

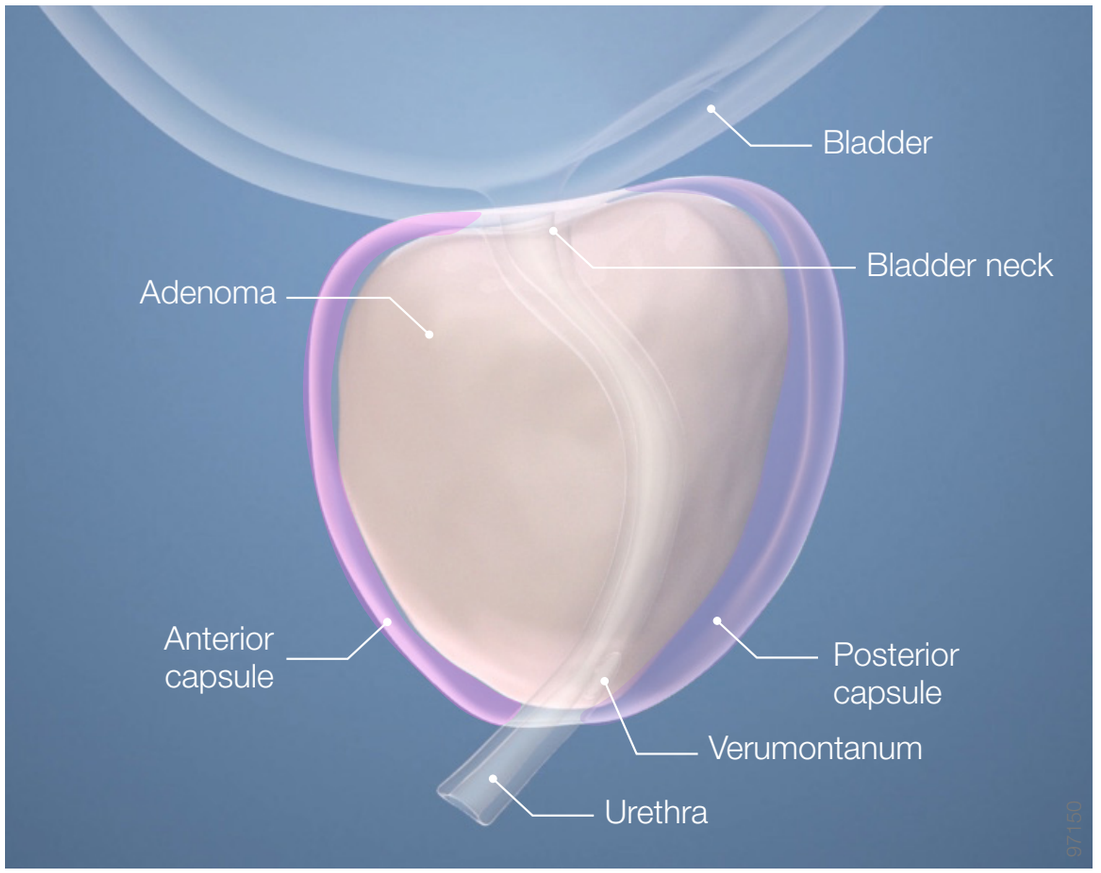
PLASMA Enucleation

For the purpose of this procedure, we refer to the main structures of the prostate as follows:

The **prostate capsule** encloses the glandular **adenoma** and prostatic **urethral mucosa**. Throughout this guide, the anterior and posterior sides of the prostate are referred to as the **anterior and posterior capsule**. The anterior capsule tends to be thinner than the posterior capsule.







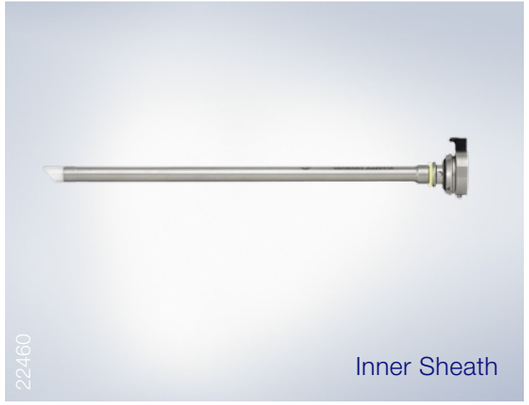
Recommended Equipment

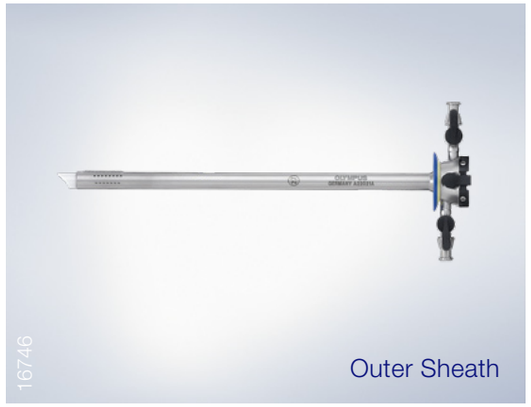
PLASMA Enucleation

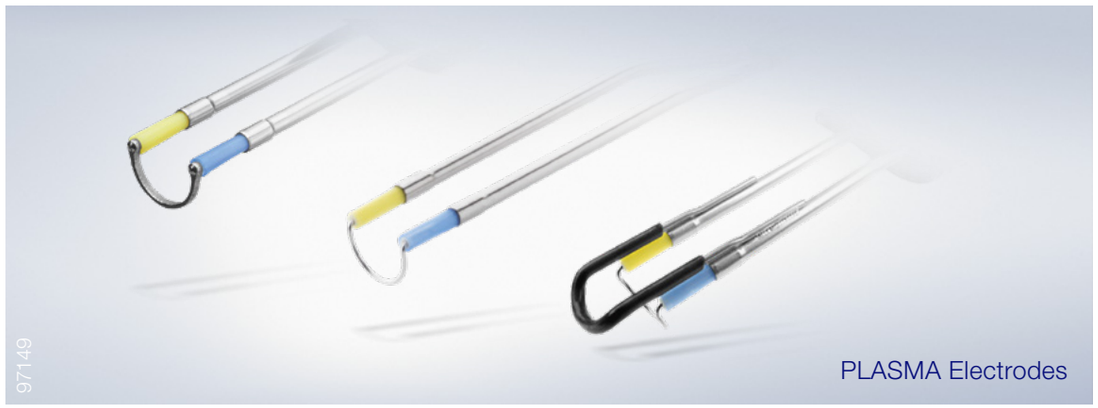
The following inventory lists the equipment that can be used to perform a PLASMA enucleation procedure.

Open **Ordering Information** >

What Is PLASMA? >







Transurethral Enucleation of the Prostate with PLASMA

Overview of Procedural Steps

1. Cystoscopy

Inspection of the Urethra and Bladder

2. Marking of Resection Borders

Go to **Step 2** ›

3. Resection of the Irrigation Channel at 6 O'Clock

Go to **Step 3** ›

4. Perform Enucleation of One Lobe

4.1 Initiation of the Prostate Lobe

4.2 Enucleation of the Prostate Lobe

4.3 Resection of the Prostate Lobe

Go to **Step 4** ›

5. Commissurotomy

Go to **Step 5** ›

6. Resection of Apex

Go to **Step 6** ›

7. Trimming of the Bladder Neck and Hemostasis

Go to **Step 7** ›

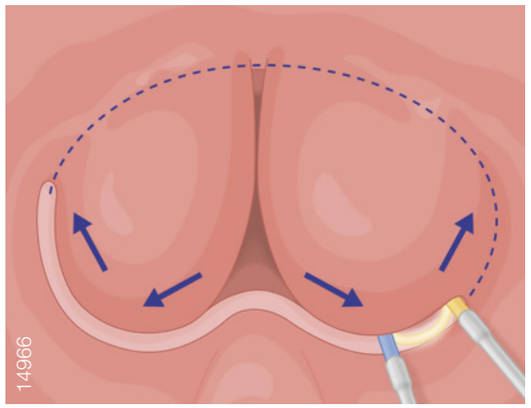
Watch the **Procedure Video** ›

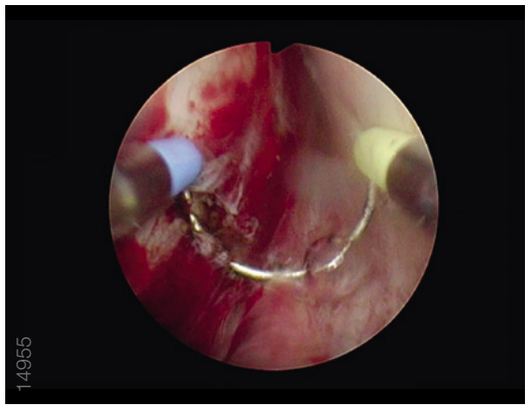
2. Marking of Resection Borders

Transurethral Enucleation of the Prostate with PLASMA

Description

After inspecting the left and right ostium, bladder, verumontanum and internal and external sphincter, start with the proximal marking of the verumontanum in EP procedures.





Key Insights

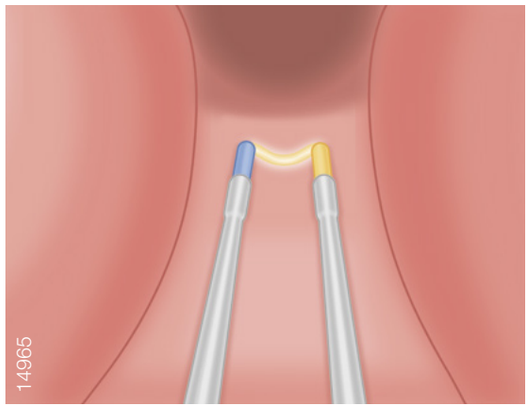
- Use the coagulation mode (coag) of the loop to superficially mark the resection borders at a distance of approximately two loops from the verumontanum.
- It is already possible to mark the working boundaries circumferentially — laterally, anteriorly and proximally to the verumontanum.

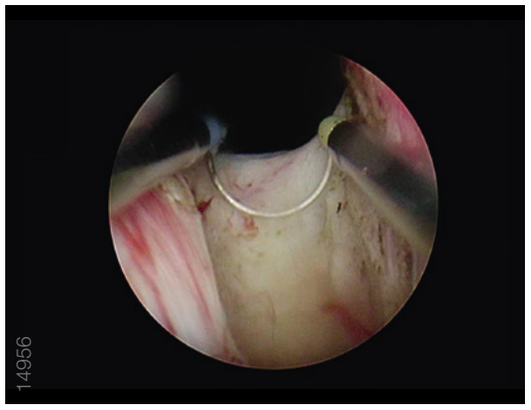
3. Resection of the Irrigation Channel at 6 O’Clock

Transurethral Enucleation of the Prostate with PLASMA

Description

PLASMA resection of the irrigation channel or, if present, a complete resection of the median lobe.





Key Insights

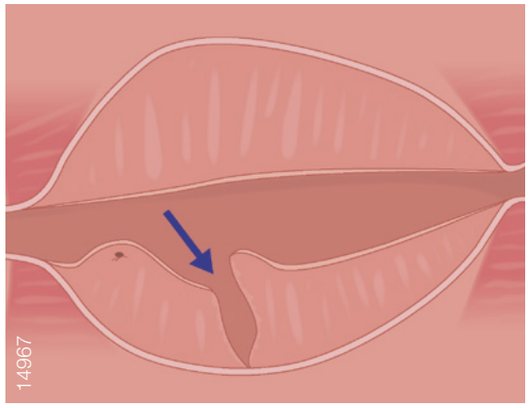
- With a two-lobe prostate, resect the 6 o’clock position starting at the bladder neck, moving down to the borders of resection.
- With a three-lobe prostate (median lobe), make two incisions at the 5 and 7 o’clock positions.
- Complete steps 4.1 to 4.3 for one lobe before continuing with the other lobe.

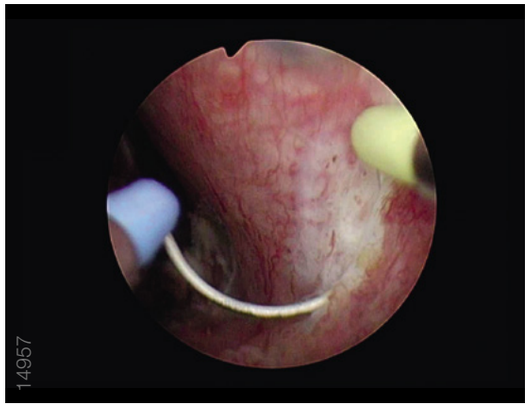
4.1 Initiation of Enucleation of the Prostate Lobe

Transurethral Enucleation of the Prostate with PLASMA

Description

Paracollicular prograde incision with PLASMA of the mucosa of the lobe.





Key Insights

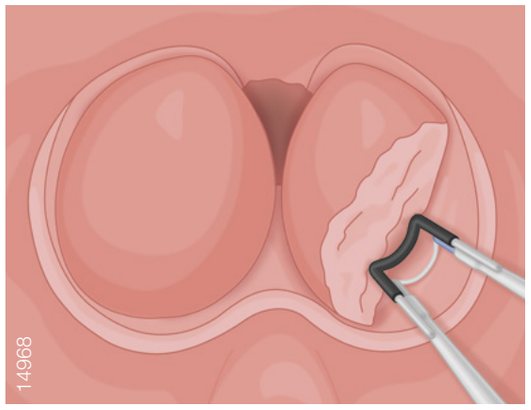
- Before beginning this step, ensure that the mucosa is incised prograde distally and laterally to the verumontanum
- Cut approximately 1 to 2 loops deep until the surgical capsule is identified.
- If ejaculatory function is to be spared, the incision around the verumontanum should be at a distance of approx. 2 loop diameters.
- Begin to find the plane between the capsule and prostatic lobe and separate the adenoma from the capsule by using the spatula of the TUEB electrode as a lever.
- The elevation of the adenoma is a gentle maneuver and should be performed without too much force.

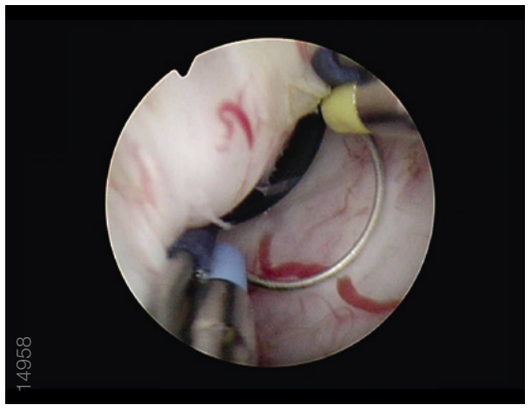
4.2 Enucleation of the Prostate Lobe

Transurethral Enucleation of the Prostate with PLASMA

Description

Mechanical separation of the prostate lobe from the capsule.





Key Insights

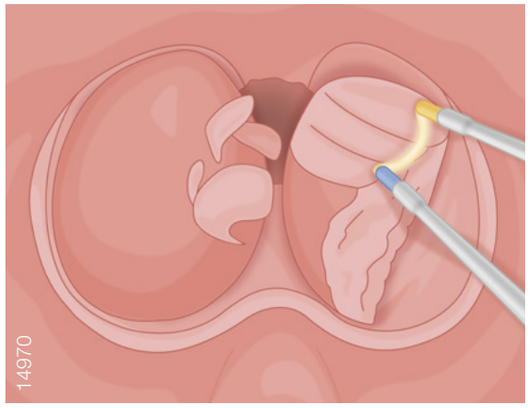
- Split and separate the tissue and the capsule step by step, without too much force, in one single push.
- Leave a bridge of tissue at the bladder neck at the 5 o’clock position. The enucleated lobe is thus held in position and can swiftly be resected.
- A free-floating prostate lobe is very difficult to dissect with a loop electrode. In this case (complete enucleation), the lobes are pushed into the bladder for morcellation.
- In most cases vessels are in the 11 and 1 o’clock positions.
- If bleeding occurs, use the loop for hemostasis. Put slight pressure on the bleeding without moving backwards and forwards with the loop.

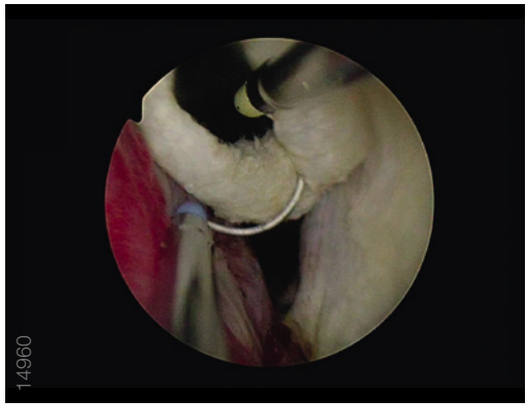
4.3 Resection of the Prostate Lobe

Transurethral Enucleation of the Prostate with PLASMA

Description

For partial enucleation, perform PLASMA resection of the enucleated lobe.





Key Insights

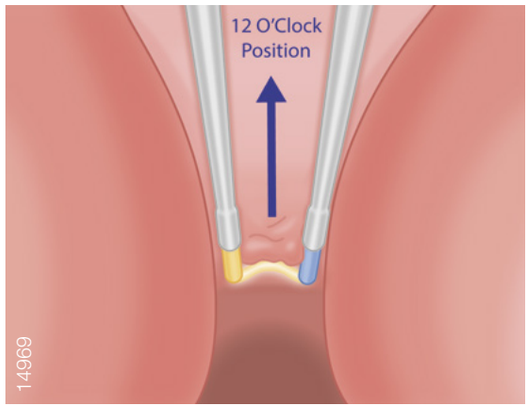
- Resect the prostatic lobe layer by layer with the loop. There should be little or no bleeding.
- Keep the chips very small. Quick, short resections will allow the chips to pass out more easily.
- After full resection of the adenoma, resect the tissue bridge without cutting into the prostatic capsule. Regular bleeding can occur at this stage.
- Ensure hemostasis is obtained.
- Complete Steps steps 4.1 to 4.3 for one lobe before continuing with the other lobe.

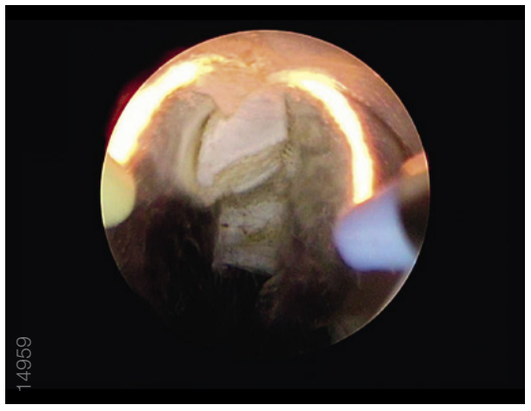
5. Commissurotomy

Transurethral Enucleation of the Prostate with PLASMA

Description

Change the TUEB electrode to a regular loop electrode and start resecting to divide the lobes.





Key Insights

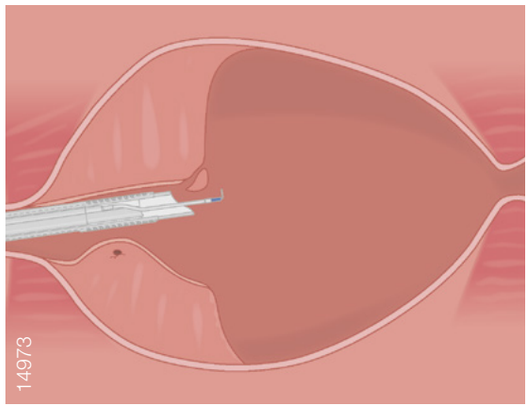
- The anterior prostate is now freed except at the bladder neck and a small 12 o'clock connection at the anterior apex.
- At the level of the bladder neck, resect the 12 o'clock channel. This channel will divide the lobes so that each can be resected independently.
- Position the tip of the outer sheath on the verumontanum to prevent unwanted cutting of the sphincter.

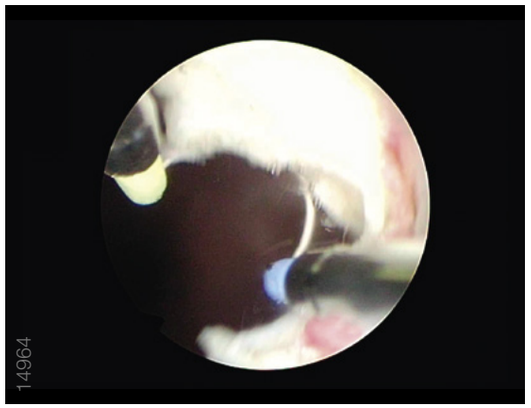
6. Resection of Apex

Transurethral Enucleation of the Prostate with PLASMA

Description

PLASMA resection of the apical part of the prostate to ensure optimal flow conditions.





Key Insights

- There will be a small amount of tissue at the apex that will remain attached at 12 o’clock.
- Resect any residual adenoma at the apex of the prostate.
- To prevent incontinence after the intervention, make sure not to cut into the sphincter.

7. Trimming of the Bladder Neck and Hemostasis

Transurethral Enucleation of the Prostate with PLASMA

Description

PLASMA resection of the bladder neck to ensure optimal flow conditions.

Key Insights

· Resect any residual adenoma at the bladder neck.

· Evacuate prostate chips with a bladder syringe.

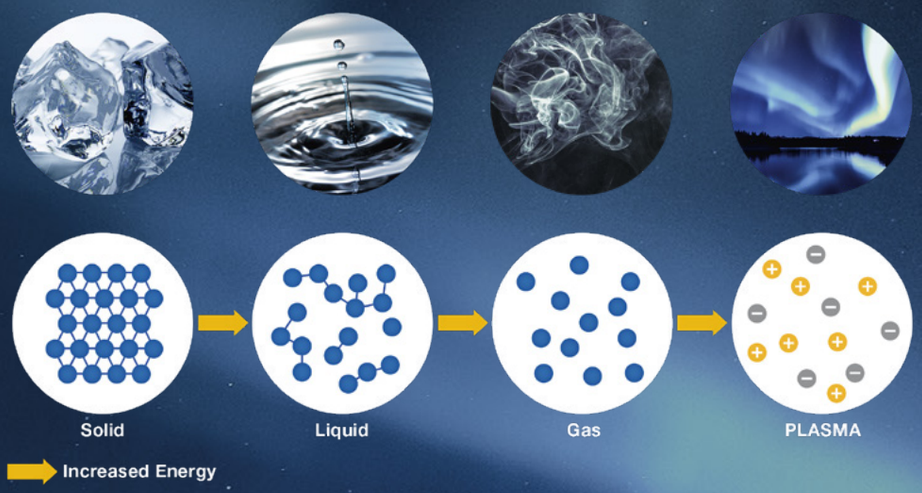
· Ensure secure hemostasis.

· Be aware of bleeding and perform spot coagulation where needed. Place the loop with slight pressure on the bleeding, activate coagulation mode, and hold until bleeding has stopped.

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 Enucleation of the Prostate with PLASMA

References

[1] Li, M., Qui, J., Hou, Q., et al. *Endoscopic Enucleation versus Open Prostatectomy for Treating Large Benign Prostatic Hyperplasia: A Meta-Analysis of Randomized Controlled Trials.* PLOS ONE. 2015 Mar 31; 10(3):e0121265. eCollection 2015.

[2] Zhu, L., Chen, S., Yang, S., et al. *Electrosurgical Enucleation versus Bipolar Transurethral resection for Prostates Larger Than 70 ml: A Prospective, Randomized Trial with 5-Year Followup.* J. Urol. 2013 Apr; 189(4):1427-31.

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