Utilizing the BackStop® Antiretropulsion Device to Prevent Stone Migration During Ureteroscopy with Laser Lithotripsy

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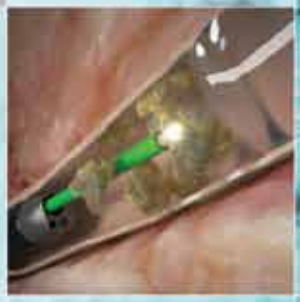
TECHNIQUE SPOTLIGHT



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Introduction

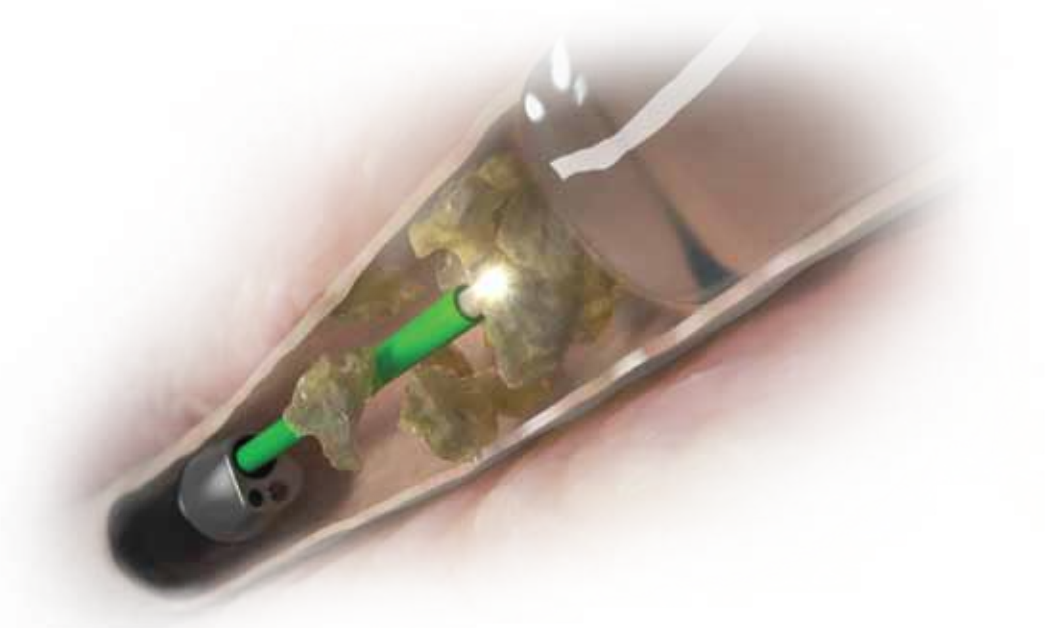
The indications for endoscopic treatment of ureteral and renal calculi continue to expand as technology evolves. Ureteroscopy provides excellent access to the upper urinary tract. The holmium laser allows fragmentation of a variety of stone types. However, retropulsion of stone fragments is a concern during the ureteroscopic treatment of ureteral calculi. Proximal migration of stone fragments up the ureter and into the kidney can prolong operative times and may add costs to the procedure. Locating and retrieving stone fragments from the kidney can be difficult, and retained stones may eventually pass, causing patient morbidity.

BackStop Catheters and Gel Syringe

Reusable BackStop Injector

The BackStop Antiretropulsion Gel can be placed in the lumen of the ureter proximal to the stone preventing migration of fragments up the ureter. The gel forms a solid plug in the ureter, preventing retropulsion of stone fragments of all sizes. It slowly dissolves over approximately 45 minutes or it can be immediately dissolved with cold saline irrigation passed through the ureteroscope. Once the injection catheter is removed, there is no additional wire in the ureter, allowing more room for laser lithotripsy.

The components of the BackStop Device are a 3F or 5F catheter, a syringe of gel (Figure 1), and a reusable injector (Figure 2).



Technique

1. A gentle retrograde pyelogram is performed at the beginning of the procedure to determine stone location and possible obstruction (Figure 3). A guidewire is passed beside the stone until it reaches the renal pelvis and upper calyces.

2. Next, the ureteroscope is driven up the ureter to the level of the stone. The 3F catheter is passed through the working channel of the ureteroscope. The tip of the catheter is gently maneuvered past the level of the stone under direct visualization (Figure 4).

3. The tip of the catheter is placed 1–2cm proximal to the stone in the ureter. The location of the catheter tip can be confirmed with fluoroscopy.

4. The syringe containing the BackStop® Gel is placed in the injector sleeve and connected to the catheter hub. The sleeve is then placed in the injector handle.

5. The BackStop Gel is then deployed by twisting the injector knob. The gel should be injected slowly to allow for more even filling of the ureteral lumen (Figure 5). The injection catheter is kept in one place while injecting the BackStop Gel in order to form a solid plug that completely occludes the ureter.

6. Once the BackStop Gel is completely injected, the catheter is removed (Figure 6).

7. A holmium laser fiber is passed through the ureteroscope. For softer stones, an energy setting of 0.2 Joules at 50 Hz is used. For harder stones, 0.5 Joules at 20 Hz is used. Once the majority of the stone is fragmented, the BackStop Gel allows for continued "popcorning" of the stone fragments in the ureter, since it prevents stone fragments of all sizes from migrating up the ureter (Figure 7).

8. Once the stone has been fragmented to dust, the ureteroscope is slowly backed down the ureter to inspect for any larger residual fragments. A nitinol basket can be placed through the ureteroscope to remove any fragments or these stones can be further broken up with the laser.

9. At the completion of lithotripsy and stone retrieval, the BackStop Gel can be dissolved by passing cold saline irrigation through the ureteroscope (Figure 8). In the event that cold saline is not readily available, the plug can be dissolved by irrigation with room temperature saline while moving the ureteroscope directly against and/or through the plug.

Figure 3
Retrograde pyelogram

Figure 4
Catheter placement

Figure 5
BackStop Gel injection

Figure 6
BackStop Gel plug

Figure 7
Stone fragments after laser lithotripsy

Figure 8
Plug is dissolved

Tips for Using BackStop® Antiretropulsion Device

1. Confirm location of catheter tip before injecting the BackStop Gel (1–2cm behind the stone).
2. If unable to place the catheter past the stone (e.g., a stone is impacted in the ureter), the holmium laser can be used to begin fragmentation. Once the stone is dislodged, the catheter can then be placed proximal to the stone.
3. When working with a ureteroscope with a separate irrigation channel, turn the irrigation down while injecting the BackStop Gel.
4. Inject the BackStop Gel slowly (1 rotation every 2 seconds).
5. Keep the injection catheter in one place while injecting the BackStop Gel.

> *"In one recent case, the ureter was severely dilated and, without the Backstop Gel, the stone would have migrated up, even with minimal irrigation. The Backstop Gel saved time and likely prevented the need to use a flexible ureteroscope. Overall, in my experience, the Backstop has been extremely effective at preventing ureteral stone migration."*
>
> - Dr. Michael Lipkin

Ordering Information

Order Number	Description	Quantity
Disposable Components		
M006**390900**0	BackStop Gel x 3F Catheter	Each
M006**390901**0	BackStop Gel x 5F Catheter	Each
Reusable Components		
M006**390904**0	BackStop Injector	Each
M006**390905**0	BackStop Replacement Sleeve	Each

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