## CARDIAC CATHETERISATION: ROTA ABLATOR

**AUTHOR**

SIVASANKARI S, DEPARTMENT OF CARDIAC TECHNOLOGY

SCHOOL OF ALLIED HEALTH SCIENCES, VINAYAKA MISSIONS RESEARCH FOUNDATION -DU,

AVMC & H, PUDUCHERRY, INDIA

[sankariselvamsahs@gmail.com](mailto:sankariselvamsahs@gmail.com)

## ABSTRACT

Heavy calcification is one of the greatest difficulties in the treatment of coronary artery disease (CAD), especially in patients with an acute coronary syndrome (ACS). Rota ablator is a procedure which aims to “bore out” a narrowing in a coronary artery which might not otherwise respond to stenting.The test is done by insertion of a long thin catheter into an artery in the groin or wrist using local anesthetic. The catheter is moved inside the artery until it reaches the heart. When the catheter is advanced in position, a small amount of dye will be injected into it. As the dye passes through the coronary arteries, X-rays will be taken. The blockage is removed with the use of a burr that has been specially designed. From a technical perspective, rotational atherectomy for plaque remodeling can be difficult. The operator must be able to collaborate wes ll with an experienced helper in addition to being familiar with the Rotablator equipment. To advance a burr frequently, the operator and aid must function flawlessly together otherwise, there is a chance to lose wire position.

**Keywords:**Rota ablator, acute coronary syndrome (ACS), coronary artery disease (CAD), rotational atherectomy (RA), coronary artery, catheter.

**I. INTRODUCTION**

**Rota ablation, also referred to as rotational atherectomy, is a minimally invasive method that clears the coronary occlusion using a tiny rotating blade (burr). A stent may be placed in the artery during the surgery to stop further obstruction. Long-standing calcific obstructions that have accumulated over time may be treated using this treatment.**

**When the plaque buildup inside the arteries is hard with calcific deposits, rotablation is recommended. Large calcium deposits cause hard blocks that can make regular balloon angioplasty ineffective for opening up the artery. Rotablation hence aids in drilling and grinding the blocks for patients with moderate to severe calcium producing the block, followed by balloon and stent.**

**II. MATERIALS NEEDED**

The WireClip torquer and its own advancer come along with the rotablator burr. A 1.25 mm or 1.5 mm burr can fit inside a 6 Fr guiding catheter, while a 7 Fr or 8 Fr guiding catheter can fit up to a 1.75 mm or 2 mm burr, respectively. Extra Support or a Rotawire Floppy can be used. Friction and heat generation are decreased by using a Rotaflush system, either with RotaglideTM lubricant or 10,000 units of a heparin and vasodilator cocktail in a 1 L bag of ordinary saline. On the end of the guiding catheter is a hemostasis valve with a Y-connector.

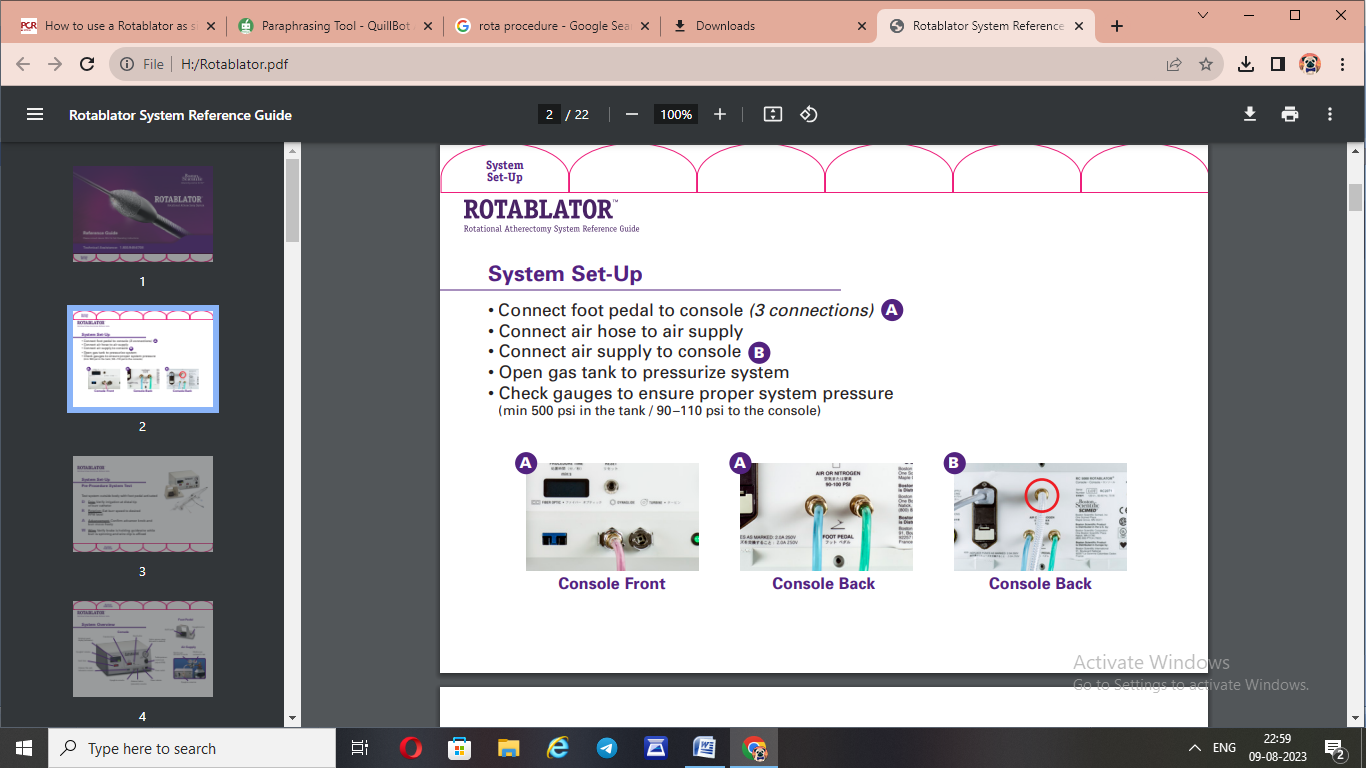
**A. System Set-Up**

• Connecting an air hose to an air supply and a foot pedal to a console requires three connections each .

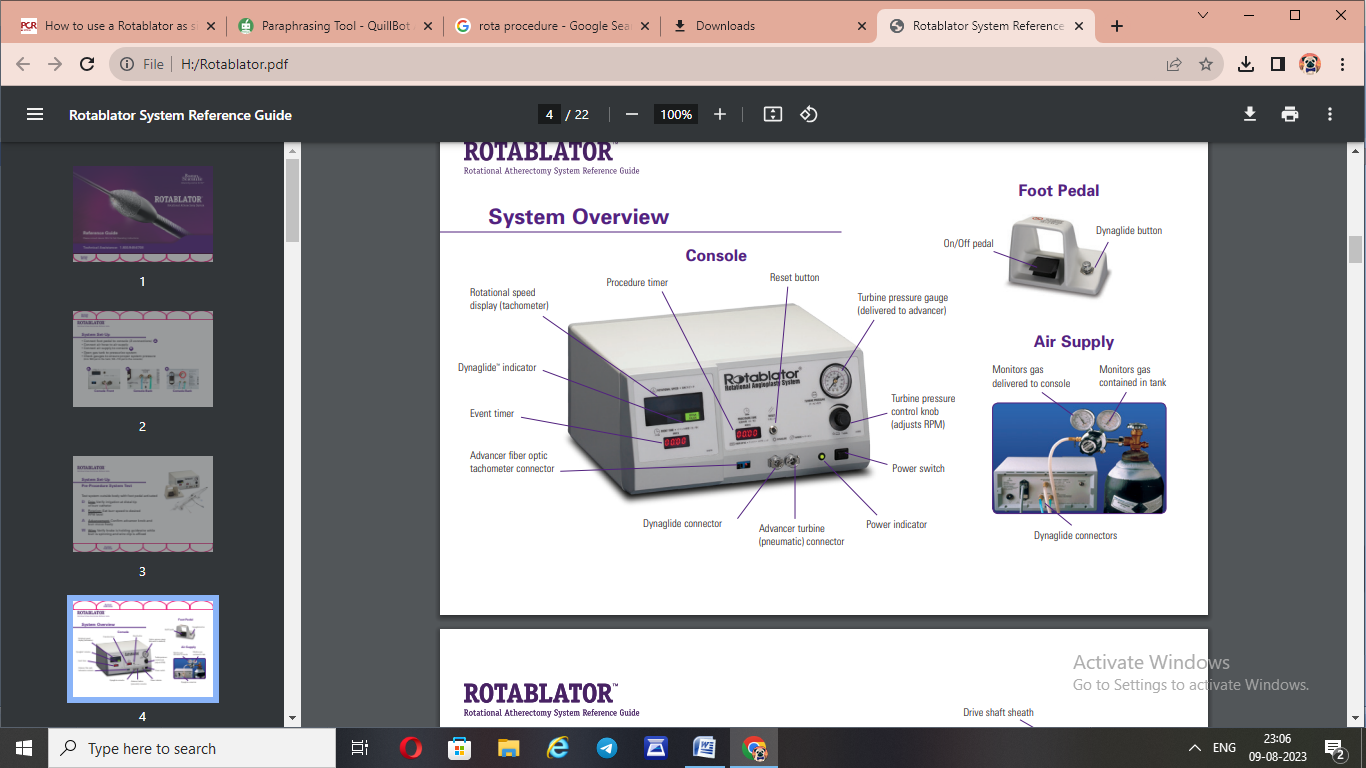
• Attach an air supply to the console.[3]

• Pressurize system by opening the gas tank.

• Check gauges to make sure the system is operating at the right pressure (minimum 500 psi in the tank and 90–110 psi at the console).



**Figure 6: System Setup**

**B. Pre-Procedure System Test**

Using the foot pedal to activate the system, perform tests outside the body

**D** Drip: Check irrigation at the burr catheter's distal tip.

**R**  Rotation : Set the burr speed to the desired RPM level.

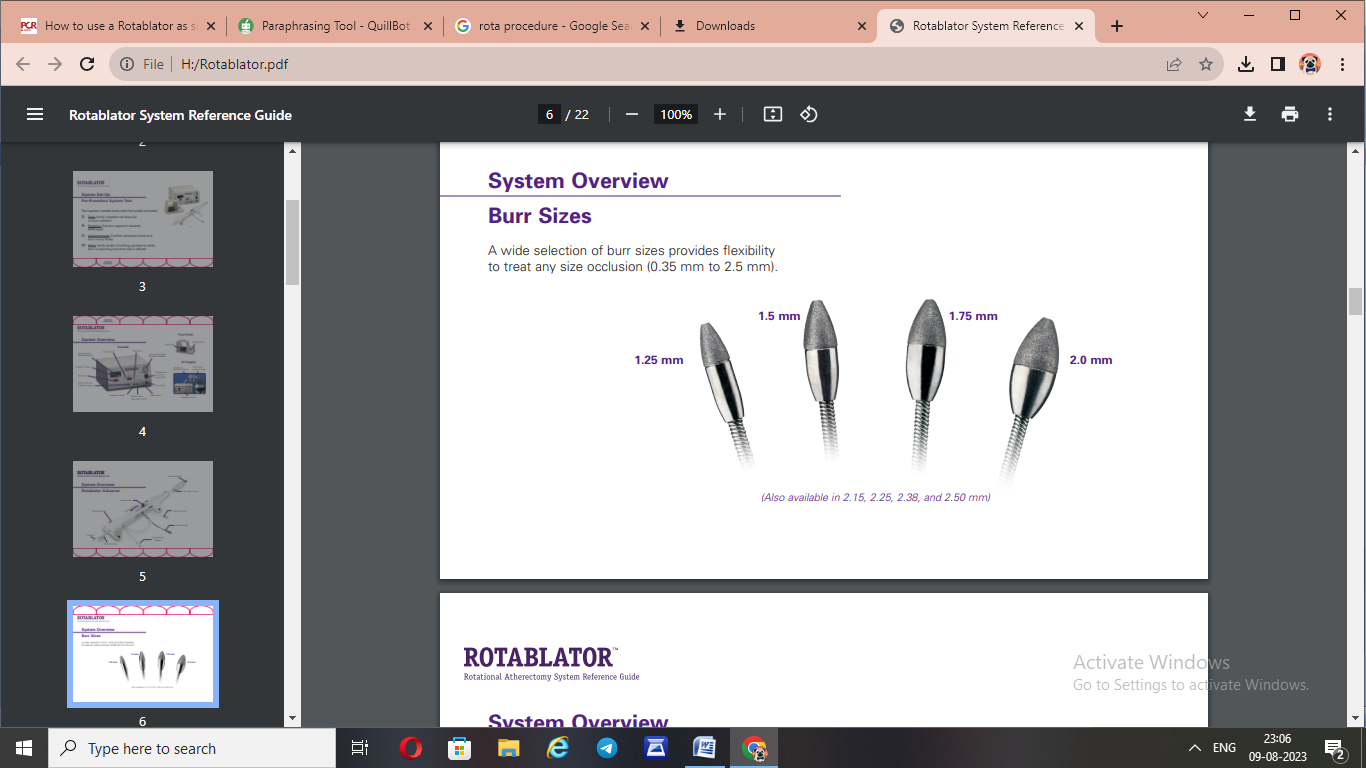
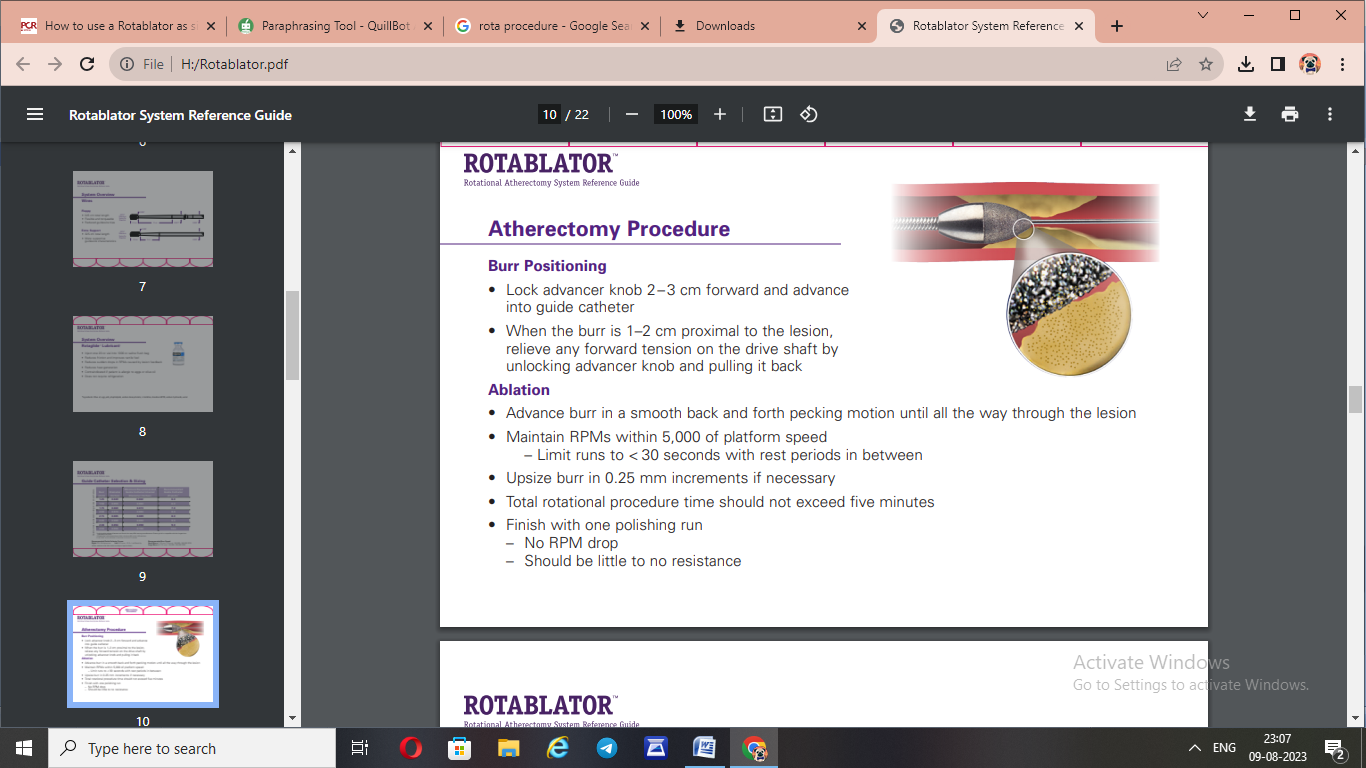
**A** Advancement: Verify that the advancer knob and burr are freely moving.

**W** Wire : While the burr is spinning and the wire clip is attached, make sure the brake is gripping the guide wire.

**Figure 7 : Rotablator device**

**C. Burr sizes:**

Sizes of Burr 1.25 mm, 1.5 mm, 1.75 mm, 2.0 mm, and 2.15, 2.25, 2.38, and 2.50 mm are also available. With a wide range of burr sizes (0.35 mm to 2.5 mm), any size obstruction can be treated.

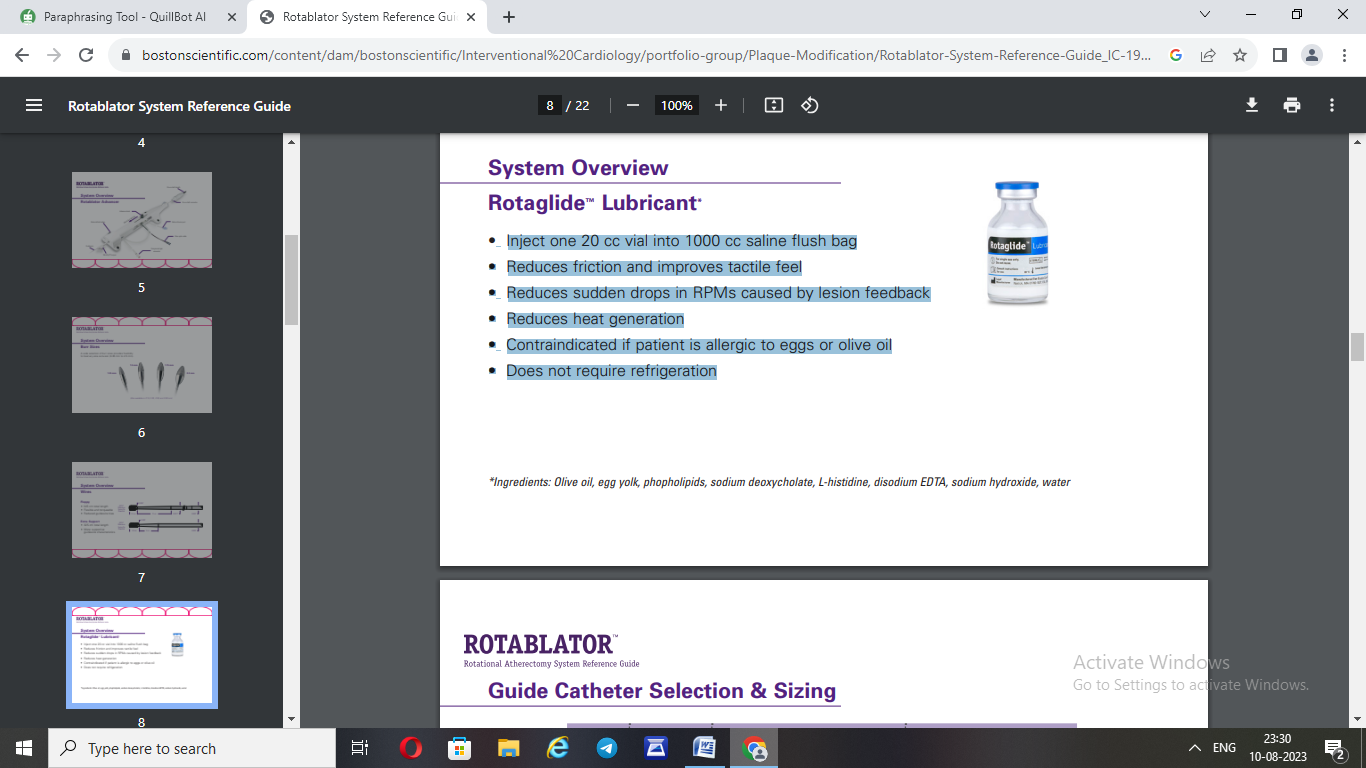
 

**Figure 8 : Burr Sizes** Figure **9 : Texture of Burr**

**D. Wires:**

1. Floppy, which has a total length of 325 cm, is flexible and torqueable.

2. Additional Support - 325 cm overall length, Stronger guidewire features

**E. Lubricant:**

* One 20 cc vial should be injected into a 1000 cc saline flush bag
* Reduce friction and improve tactile feel
* Lessen unexpected drops in RPMs brought on by lesion feedback
* Decrease heat generation
* Not be used on patients who are allergic to eggs or olive oil
* Not need refrigeration

**Figure 10 : lubricant**

## III. METHOD STEP-BY-STEP

### Step 1: Preparing to advance the burr

### Screenshot (31).png

### Figure 11: the burr is advanced over the wire until 2-3cm from the y-connector. The burr is tested and primed at >150000 rpm with the wireclip torquer clip onto the wire.

### Screenshot (33).png

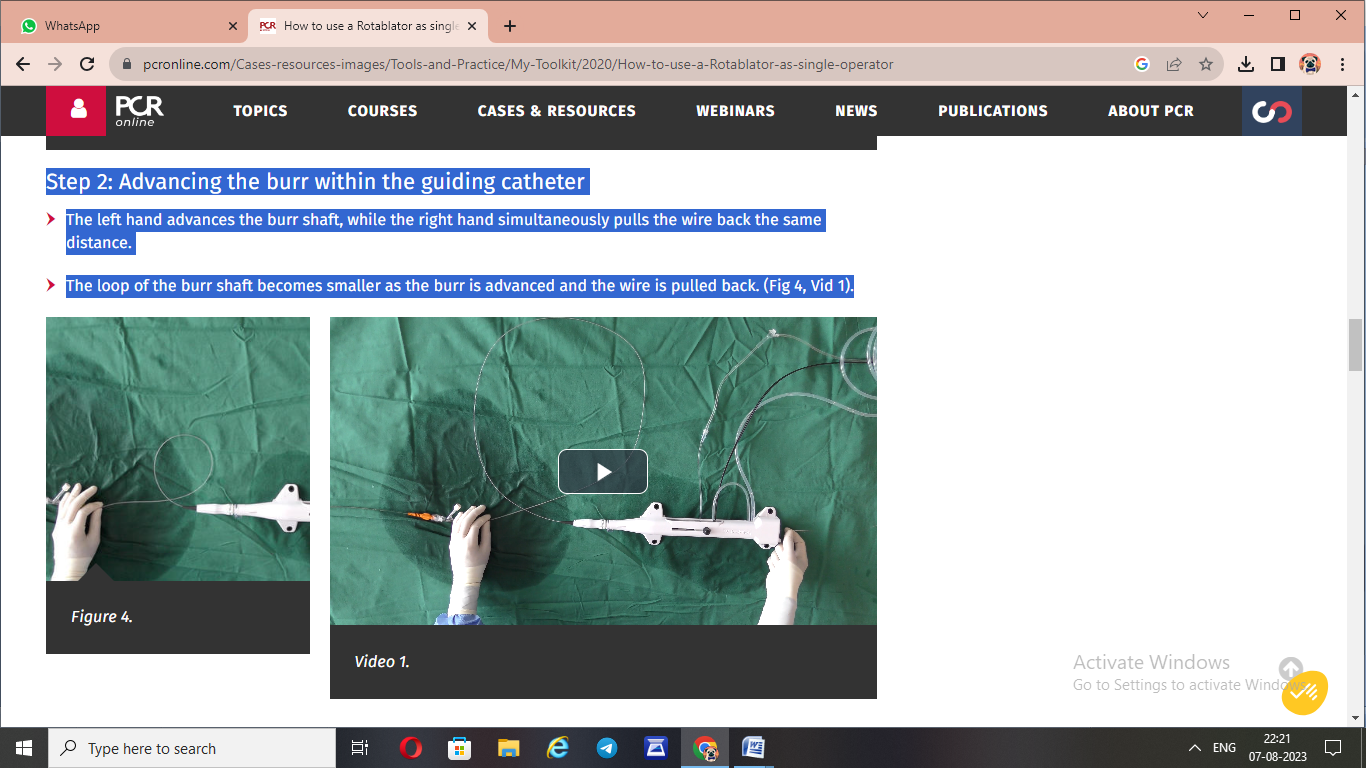
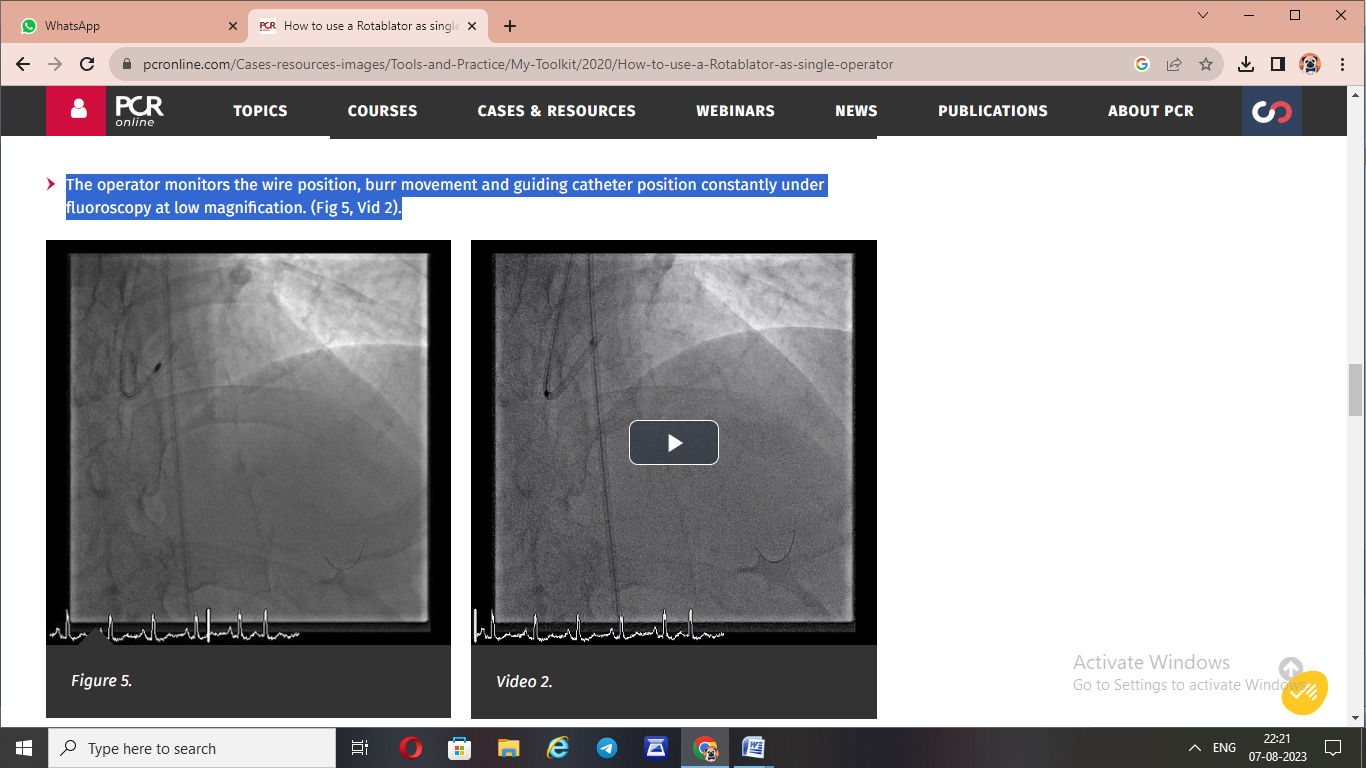
### Screenshot (32).png

### Figure 13: The brake defeat button is depressed, and the wireclip torque is slotted in correctly. This allows the wire to move freely.

**Figure 12: The advancer is moved close to the Y-connector. The burr shaft forms a big loop.**

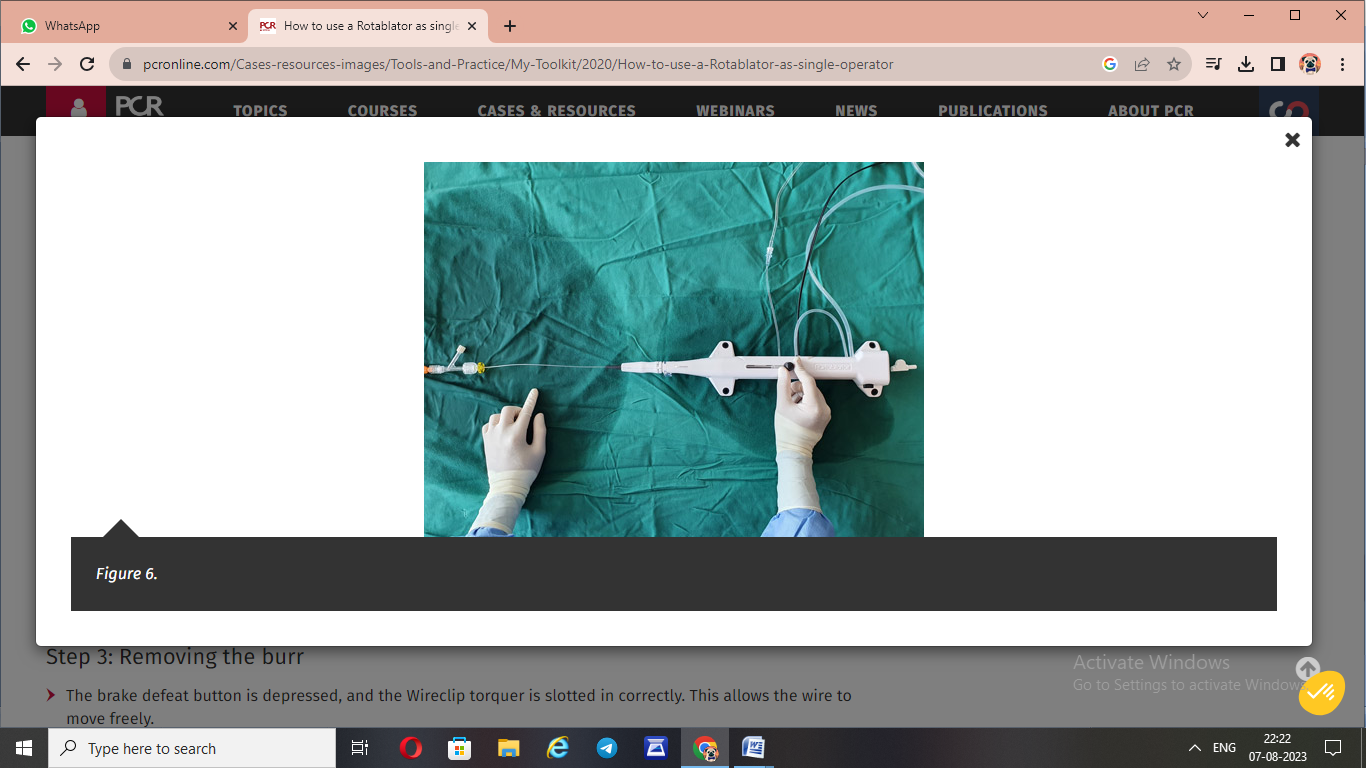
### Step 2: Advancing the burr within the guiding catheter

* The left hand advances the burr shaft, while the right hand simultaneously pulls the wire back the same distance.
* The loop of the burr shaft becomes smaller as the burr is advanced and the wire is pulled back. (Figure 14).

**Figure 14: Positioning of Catheter Figure 15: Burr Position in Cath**

* The operator monitors the wire position, burr movement and guiding catheter position constantly under fluoroscopy at low magnification. (Figure 15).
* The burr is advanced beyond the guiding catheter and proximal to the lesion. The loop of the burr shaft is no longer present. The brake defeat button is released and the wire is locked. The WireClip torquer is clipped onto the wire (Figure 16). Plaque modification with rotablator can now be performed.



**Figure 16 : SYSTEM SET UP**

Step 3: Removing the burr

* Press the brake defeat button,and the torquer for wireclips is slotted in correctly. This allows the wire to move freely.
* The Y-connector hemostasis valve is left open for the burr to exit.
* Activating constant ‘Dynaglide’ mode, a rapid pushing of the wire forward will propel the burr backwards until it exits the guiding catheter and Y-connector.
* The operator monitors the wire position, burr movement and guiding catheter position constantly under fluoroscopy at low magnification.

## Points of specific attention

The operator should be vigilant about the fluoroscopy screen while moving the burr through the guiding catheter, paying special attention to the wire location. Depending on the situation, the operator can modify the left or right hand movements. More pulling with the right hand is required if the wire moves too far forward. Less right-hand pulling on the wire will correct its position if it comes back.

One of the following two procedures may be utilized if the burr encounters resistance at the guiding catheter curve:

• A straightforward 'tug-and-pull' motion, which involves firmly pressing the shaft with the left hand and firmly tugging the wire with the right hand, all the while keeping an eye on the positioning of the guiding catheter.

• Using 'dynaglide' for a brief period of time.

**IV. COMPLICATIONS**

1. Bradycardia and Atrioventricular blocks [4]
2. Slow Flow Or No Reflow And Vasospasm
3. Dissection
4. Perforation
5. Side branch occlusion
6. hypotension Rotabalator System Failure
7. Burr Entrapment . Burr Detachment. Burr Stalling.

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