Rotablator burr catheter entrapment

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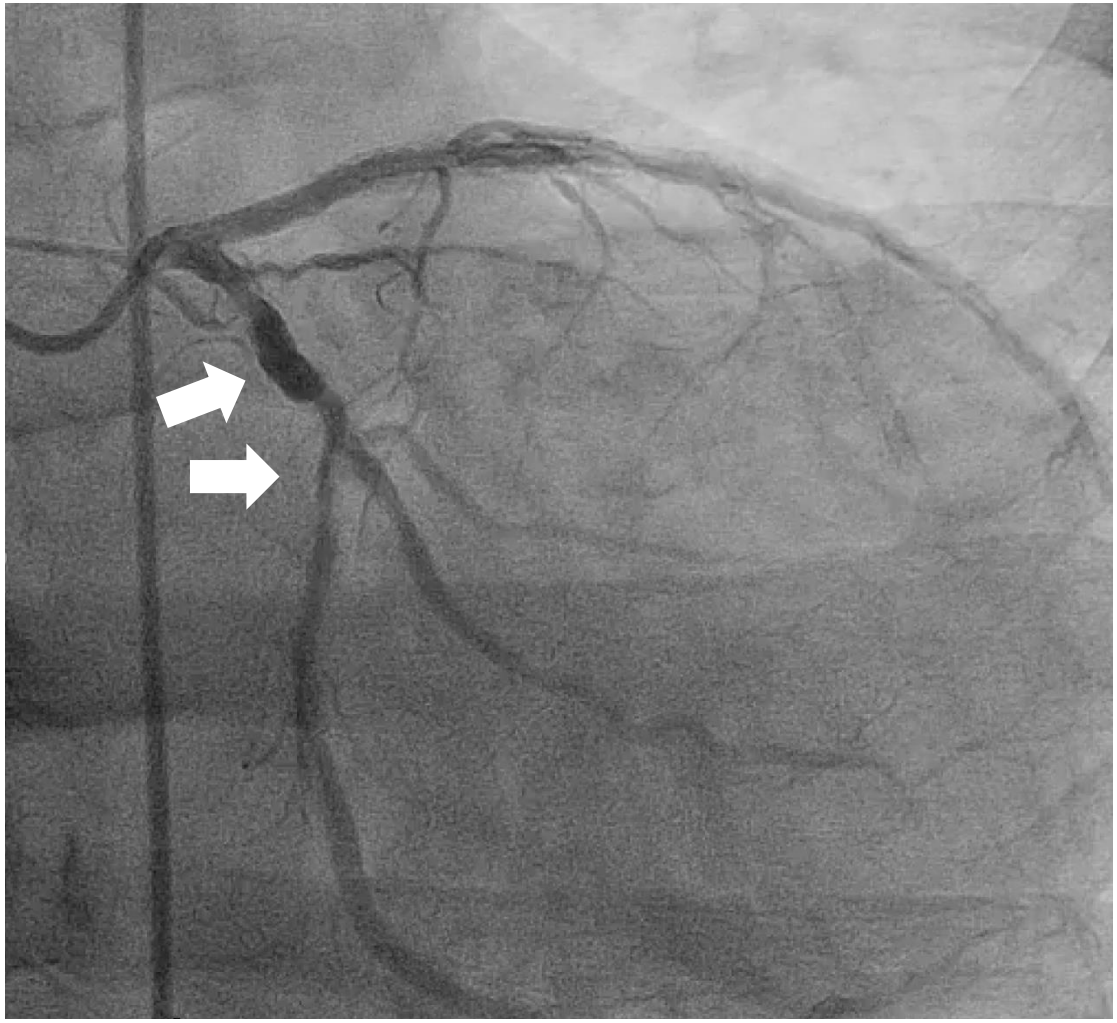
INTRODUCTION

- Burr entrapment during rotational atherectomy is a rare complication which may lead to serious consequences
- Mostly involves entrapment within the lesion
- Only few reported involvement of the guide catheter which is usually a damaged tip
- We present a case of a Rotablator burr entrapped within the guiding catheter

Oda H, Tagawa M, Miida T, Takahashi K, Higuma N. Guide catheter damage during rotational coronary atherectomy of aorto-ostial lesions. Jpn Heart J. 2000; 5:649-57
Hurt C, Schurtz G, Lemesle G, Sudre A, Van Belle E, Delhaye C. Catheter tip erosion due to rotablator burr: an unusual complication. Cardiovasc Revasc Med. 2016; 3

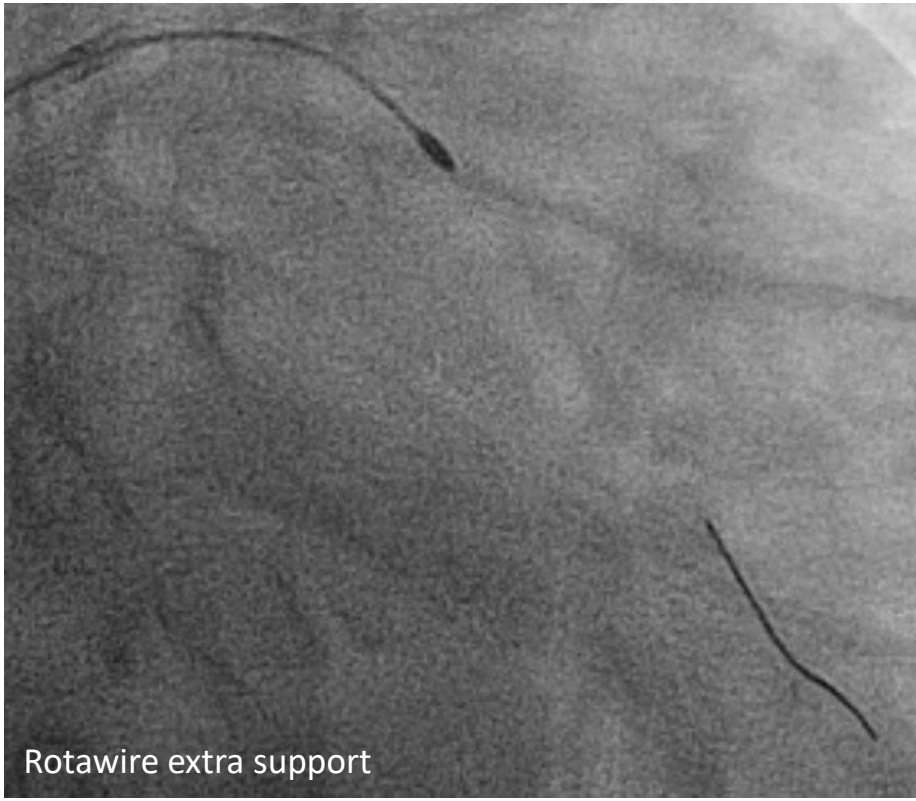
CASE

- 63-year-old male
- Known CAD of the LAD s/p PCI 10 years ago
- Intermittent chest pain with progressive heart failure symptoms
- 2D echocardiography showed severely depressed LV systolic function with segmental wall motion abnormality
- Coronary angiogram showed in-stent restenosis of the LAD and severe CAD of the LCx with heavy calcifications



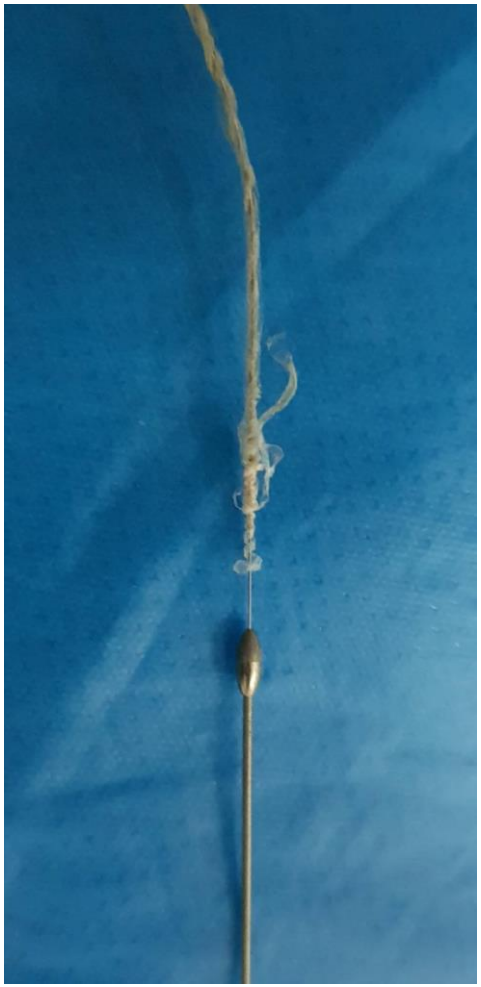
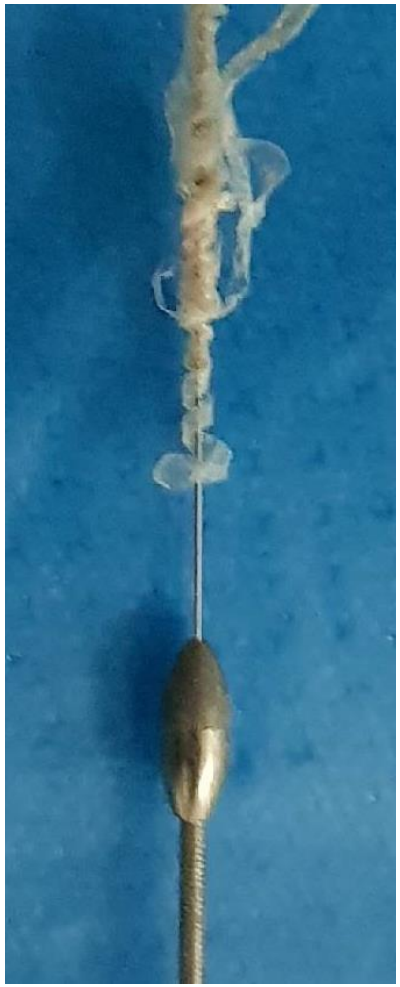
PCI

- 6F ESU 3.5 guiding catheter *(Innovative Health Technologies, Iberhospitex, Barcelona, Spain)*
- Still with inadequate lesion preparation despite use of non-compliant and scoring balloons
- Four runs of rotational atherectomy were done using a Rotablator 1.5mm burr at 190,000-200,000 rpm
- Difficulty in manipulating the Rotablator burr with failure to remove it from the guiding catheter despite use of the Dynaglide feature
- Damped pressure → the whole system was pulled out



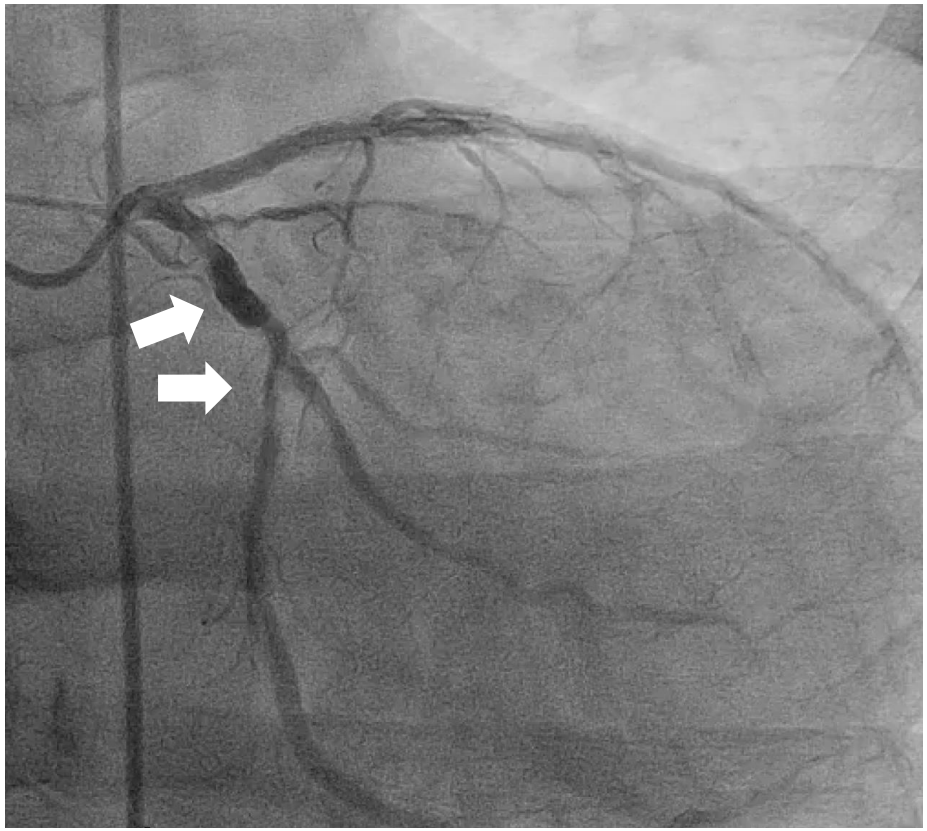
Gross Inspection



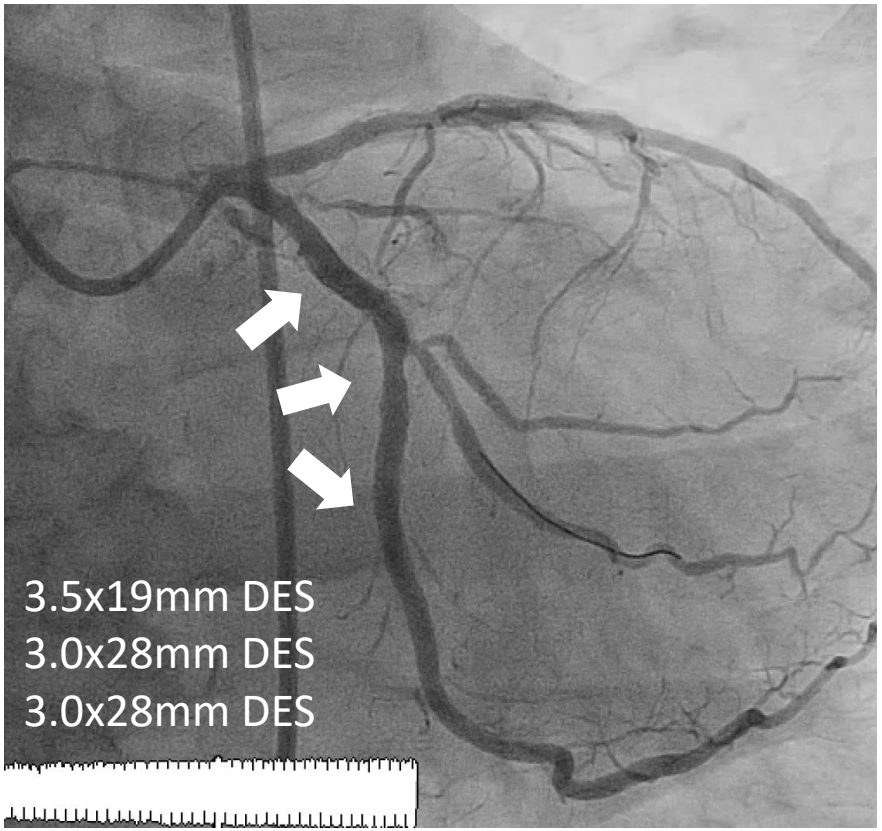



CASE

- A 6F EBU 3.5 was then used and for the completion of the procedure
- Successfully concluded without complication



Baseline



Final

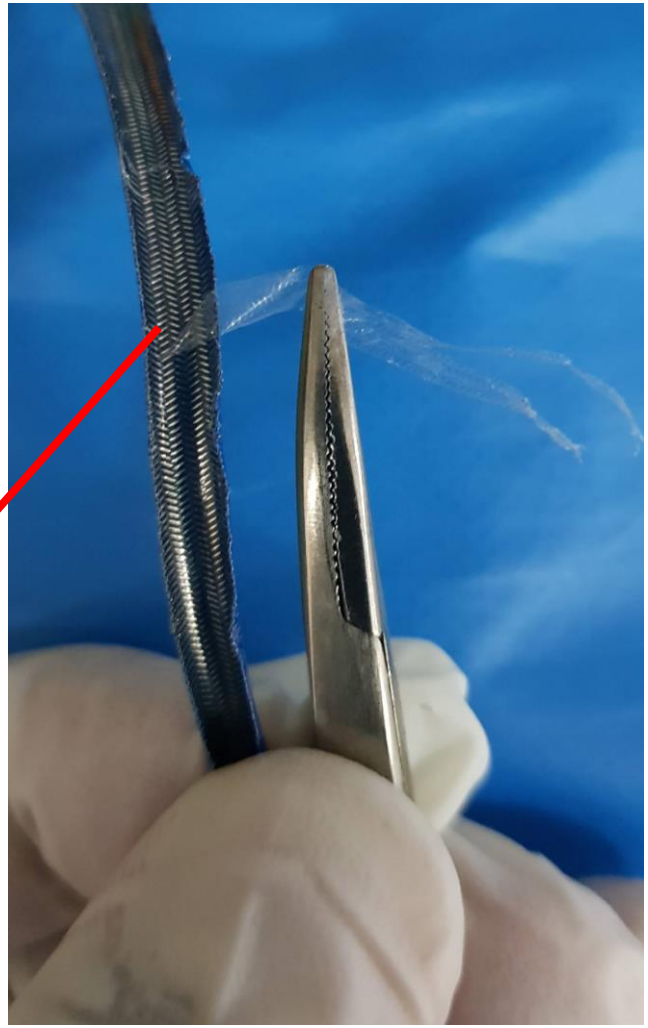
CONCLUSION

Longitudinal section

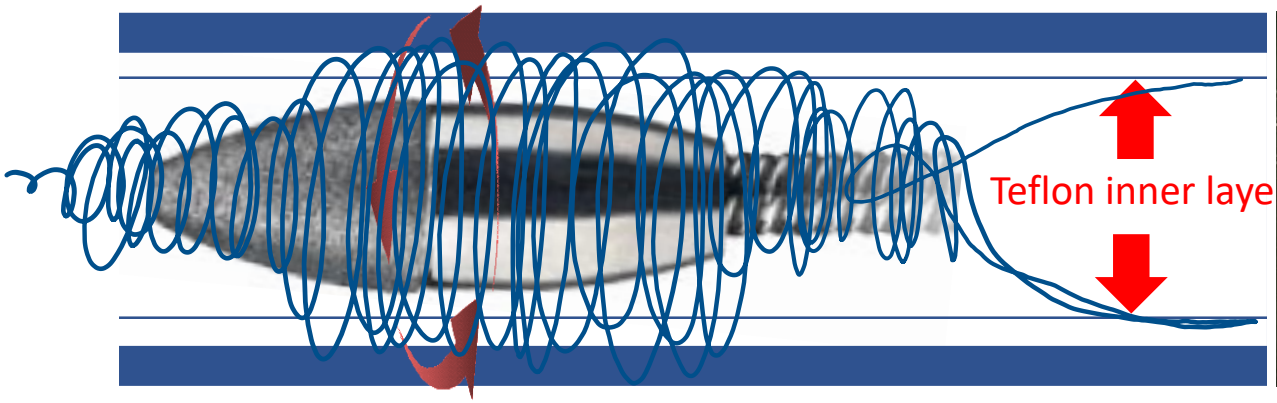
- Cause of rotablator entrapment

- Inner guide catheter lining with plastic material

6F ESU 3.5 guiding catheter *(Innovative Health Technologies, Iberhospitex, Barcelona, Spain)*

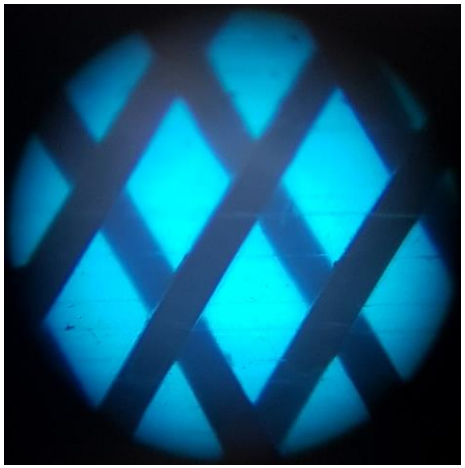


Perfect setting for burr entrapment

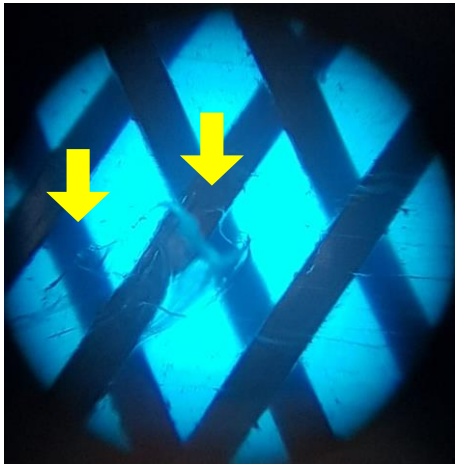


"*web-wrap* phenomenon"

Microscopic View



Normal



Microscopic abrasion of the inner lining of the guide catheter

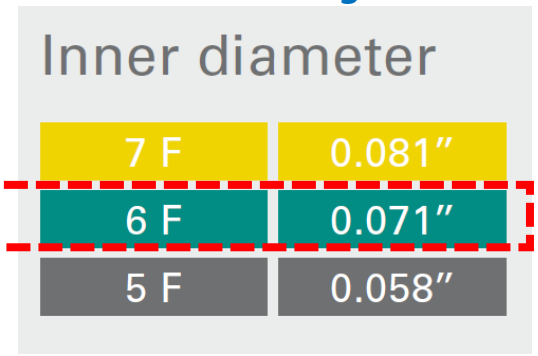
DISCUSSION

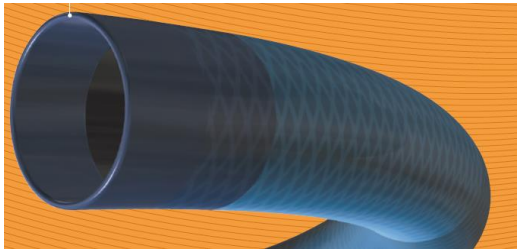
Guide sizes are based on larger lumen catheters.

Burr (mm)	Diameter (Inches)	Minimum Recommended Guide Catheter Internal Diameter (Inches)	Recommended Guide Catheter (French)*,†
1.25	0.049	0.060‡	6.0
1.50	0.059	0.063	6.0
1.75	0.069	0.073	7.0
2.00	0.079	0.083	8.0
2.15	0.085	0.089	8.0
2.25	0.089	0.093	9.0
2.38	0.094	0.098	9.0
2.50	0.098	0.102	10.0

* Inside guide catheter diameter and french size may differ among manufacturers. Ensure guide is compatible with the largest burr intended to be used.
† Sheath size is the determinant of the minimum ID on the 1.25 mm burr.
‡ Add 0.004" to burr diameter to calculate minimum ID needed

Access ESU Guiding Catheter





(Innovative Health Technologies, Iberhospitex, Barcelona, Spain)

ROTABLATOR™
Rotational Atherectomy System Reference Guide

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Rotablator Rotational Atherectomy System
Prior to use, please see the complete "Directions for Use" for more information on Indications, Contraindications, Warnings, Precautions, Adverse Events and Operator's Instructions.

Intended Use/Indications for Use: Percutaneous rotational coronary angioplasty with the Rotablator Rotational Atherectomy System, as a sole therapy or with adjunctive balloon angioplasty, is indicated in patients with coronary artery disease who are acceptable candidates for coronary artery bypass graft surgery and who meet one of the following selection criteria:
- Single vessel atherosclerotic coronary artery disease with a stenosis that can be passed with a guidewire
- Multiple vessel coronary artery disease that in the physician's judgment does not pose undue risk to the patient
- Certain patients who have had prior percutaneous transluminal coronary angioplasty (PTCA), and who have a restenosis of the native vessel or,
- Native vessel atherosclerotic coronary artery disease that is less than 25 mm in length.

Contraindications and Restrictions
Contraindications:
1. Occlusions through which a guidewire will not pass.
2. Last remaining vessel with compromised left ventricular function.
3. Saphenous vein grafts.
4. Angiographic evidence of thrombus prior to treatment with the Rotablator System. Such patients may be treated with thrombolytics (e.g. Urokinase). When the thrombus has been resolved for two to four weeks, the lesion may be treated with the Rotablator System.
5. Angiographic evidence of significant dissection at the treatment site. The patient may be treated conservatively for approximately four weeks to permit the dissection to heal before treating the lesion with the Rotablator System.

Restrictions: Federal (USA) law restricts the use of this system to physicians who are credentialed in angioplasty and who have attended the Rotablator System Physician Training Program.

Warnings: The risks of Rotational Atherectomy can be reduced if the device and associated accessories are used in the appropriate patient population by a physician who has had adequate training. The use of Rotablator for in-stent restenosis might lead to damage of stent components and/or Rotablator System, which may lead to patient injury.

Precautions: Treating certain types and/or locations of lesions or patients with certain conditions is inherently riskier, regardless of the therapeutic device being used. For many of these applications, relatively few cases have been carried out using the Rotablator System. Physicians should be aware of the higher risk when treating such patients and the lack of scientific evidence for treatment in the following applications:

1. Patients who are not candidates for coronary artery bypass surgery
2. Patients with severe, diffuse three-vessel disease (multiple diseased vessels should be treated in separate sessions)
3. Patients with unprotected left main coronary artery disease
4. Patients with ejection fraction less than 30%
5. Lesions longer than 25 mm
6. Angulated (≥ 45°) lesions. There has been limited experience with the brachial approach.

Adverse Events: Potential adverse reactions which may result from the use of this device include but are not limited to: • Angina or unstable angina • Arrhythmias • Bailout stenting • Cardiac perforation • Cardiac tamponade • Conduction block • Coronary artery spasm • Death • Drug reactions, allergic reaction to contrast medium • Embolism (coronary, cerebral, peripheral) • Hemorrhage or hematoma • Infection, local infection, systemic infection • Myocardial ischemia • Myocardial infarction (Q-wave and non Q-Wave) • Pericardial effusion • Pulmonary edema/cardiogenic shock • Slow flow, no flow, abrupt vessel closure • Stroke • Vascular thrombus • Vessel trauma (dissection, perforation, rupture or injury)

There may also be complications associated with distortion, kinks, and fracture of the guidewire and physical deterioration or malfunction.

Caution: Federal Law (USA) restricts this device to sale by or on the order of a physician.

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IC-193906-AA APR2014

No precaution/ warning/ contraindication mentioned

CONCLUSION

- One of the first *(if not the first)* documented case to demonstrate such complication

- If not recognized, it can lead to thrombus formation and embolization of eroded material causing deleterious consequences

- Proper choice of guiding catheter and better understanding of their unique characteristics play an important role in PCI success

Cardinal Santos Medical Center

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Thank you for your attention.